Marrying
Resource and Processing

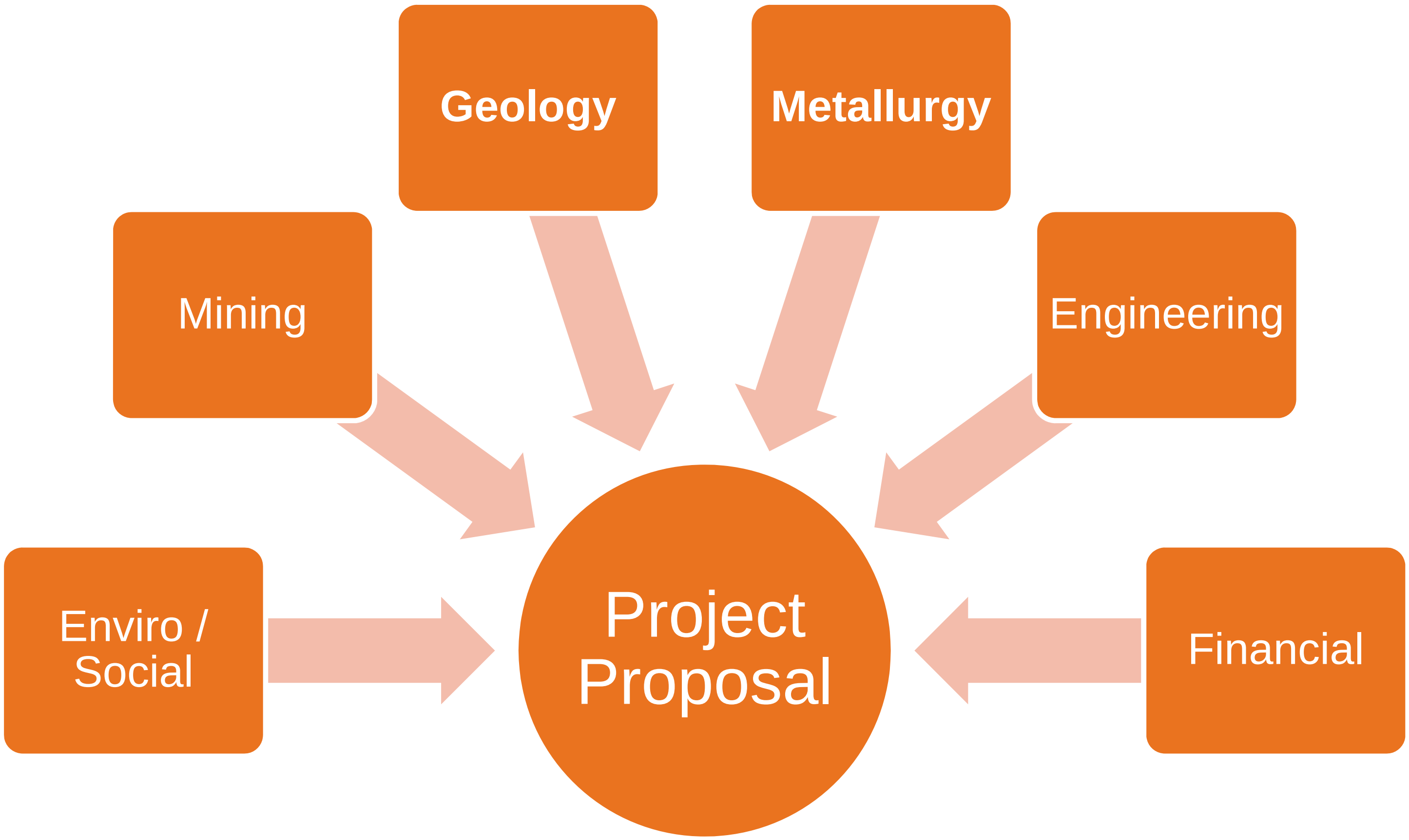
Asmara Mining Conference 2014

1 October 2014

Mark Chesher

Marrying resource and process

The professional circle



Topics for today

- Reporting Standards
- The planning cycle
- How geology data is used
- 3D modelling
- Some examples

Reporting Standards - Resources

A ‘Mineral Resource’ is a concentration or occurrence of solid material of economic interest in or on the Earth’s crust in such form, grade (or quality), and quantity that there are reasonable prospects for eventual economic extraction. The location, quantity, grade (or quality), continuity and other geological characteristics of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge, including sampling.

JORC 2012

Reporting Standards – Why have them?

1. There were notable frauds
2. Non performance

Standards now linked to the listing rules of several stock markets around the world – so we have to take notice.

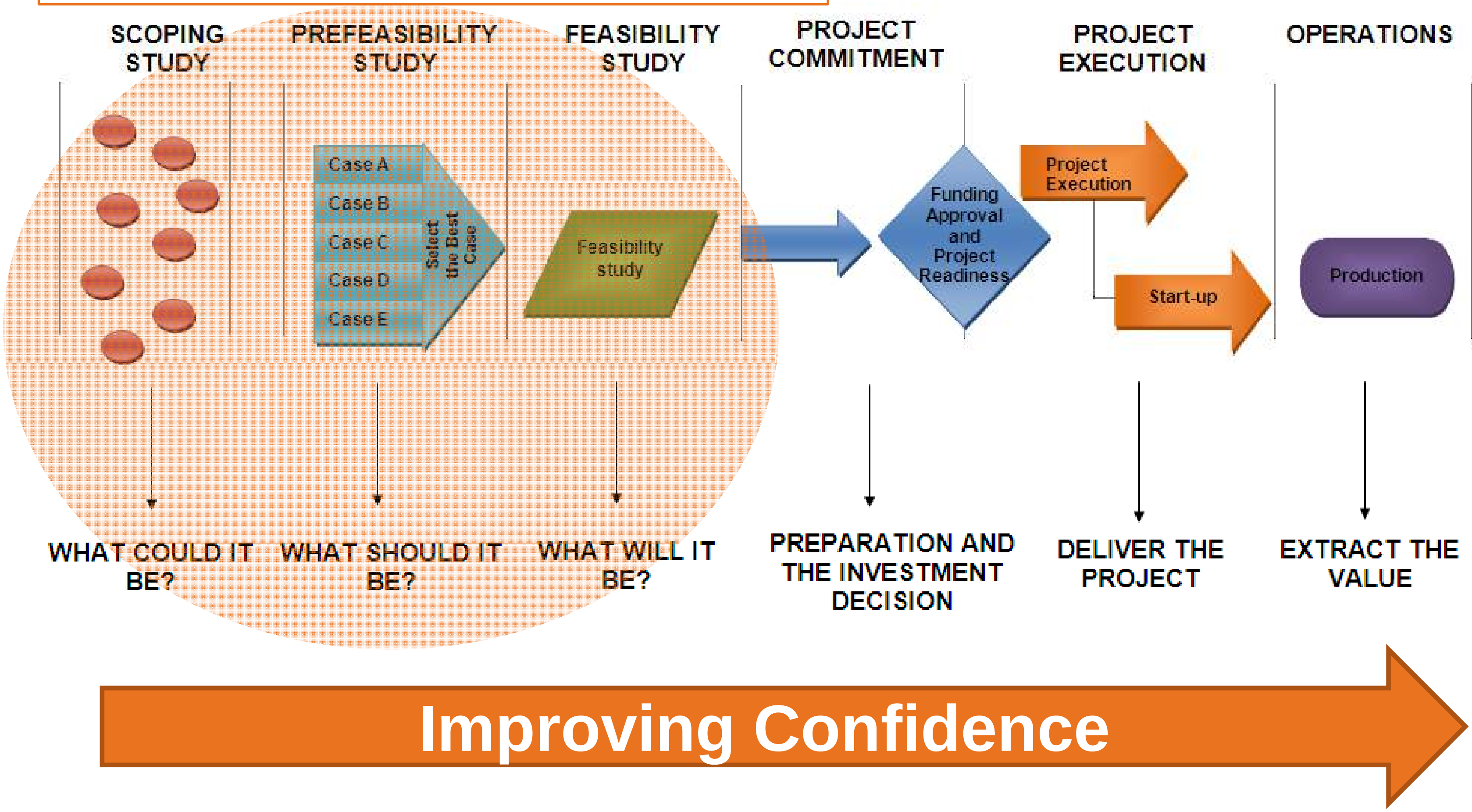
Topics for today

- Reporting Standards
- **The planning cycle**
- How geology data is used
- 3D modelling
- Some examples

The Planning Cycle

RELATIVE STUDY COST

X　　5X - 10X　　25X - 100X



The Planning Cycle – Study Manager

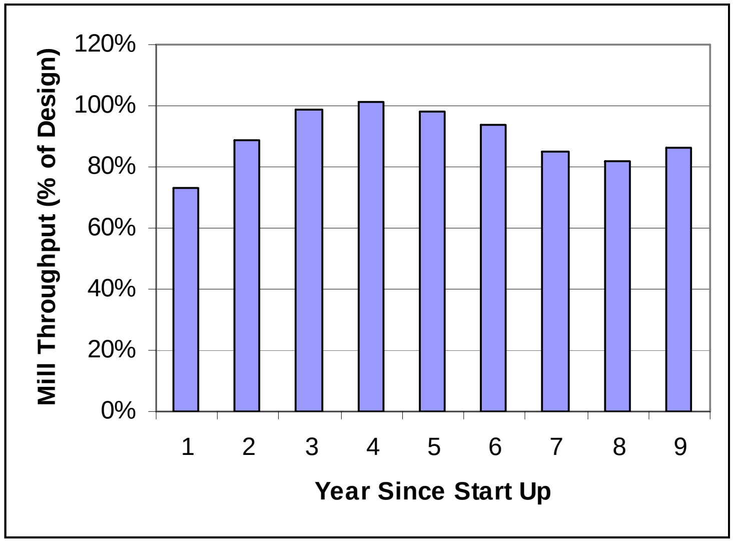
1. Ensure material risks to the project are identified early
2. Project scope and schedule should be comprehensive and well managed
3. Avoid rework
4. Progressively improve the confidence in the outcomes

5. Ultimately

Minimize study cost for an optimal result

Why Do Feasibility Studies Fail?

A study of the start-up performance of nine Australian underground base metal mines found that only 50% achieved design throughput by Year 3 and 25% never achieved it at all.



Base Metal Mine Start-ups

McCarthy and Ward 1999

Why Do Feasibility Studies Fail?

SECOND STUDY WITH 56 MINES ANNOUNCED 1988/89
ONLY 20% EXCEED EXPECTATIONS; 25% FAILED

Area of Problem	Frequency
Geology, resource and reserve estimation	17%
Geotechnical analysis	9%
Mine design and scheduling	32%
Mining equipment selection	4%
Metallurgical test work, sampling and scale-up	15%
Process plant equipment design and selection	12%
Cost estimation	7%
Hydrology	4%

Why Do Feasibility Studies Fail?

Geology, resources & reserves estimation

- ❑ Inadequate attention to local variability
- ❑ Inadequate attention to dilution and ore loss
- ❑ Statistics & modelling override common sense.

Metallurgical test-work, sampling and scale up

- ❑ Metallurgical domains not understood.
- ❑ Testing done on unrepresentative composites
- ❑ Failure to identify process contaminants
- ❑ Inability to handle ore types as per mining schedule
- ❑ Process water chemistry differs with laboratory

Why Do Feasibility Studies Fail?

A review of nearly 50 North American projects showed that only 10% achieved their commercial aims with 38% failing within about one year

(Harquail, 1991).

Why Do Feasibility Studies Fail?

In the 1980s, a study of 35 Australian gold mines found that 68% failed to deliver the planned head grade

(Burmeister, 1988)

In the 1970s, a study for the World Bank showed that in the first year of operation after commissioning, 60% of the mines and 70% of the treatment plants surveyed achieved a production rate of less than 70% of design capacity.

Topics for today

- Reporting Standards
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- **How geology data is used**
- 3D modelling
- Some examples

What to collect and how is it used?

The Concept Study:

a. Generally supports the request for additional funding

b. Prepares for PFS stage where leverage is greatest for process flowsheet and value optimisation

c. Often involves non-development professionals (as the funding is not yet assured)

d. Can be a lonely place for a geologist. But all you need to do is seek some help from those who have been there before

What to collect and how is it used?

- Economic element analysis (grade)
- Deleterious element analysis (S, F, As, Hg, etc)
- Lithology
- Alteration
- Weathering/Oxidation (Ox, Pox, Primary)
- Mineralogy including gangue minerals
- Grain size and texture
- Rock strength, hardness and breakage
- Water levels and quality

What to collect and how is it used?

ROCK PROPERTIES	Resource Model	Fragmentation Model	Throughput Model	Recovery Model	Costs and Revenue Model
Grade	x			x	x
Lithology	x			x	x
Alteration	x			x	x
Weathering	x			x	x
Mineralogy	x	x	x	x	x
Texture		x	x	x	x
Met recovery				x	
Rock Strength		x	x		x
Rock Hardness		x	x		x
Rock breakage			x		x

What to collect and how is it used?

Metallurgical Testing:

- Comminution behaviour
- Metallurgical responses
- Smelter characteristics
- Throughput and recovery relationships

Metallurgical data needs:

- Reagent consumption
- Throughput rates by Ore Type
- Deleterious minerals by Ore type
- Product recovery by Ore Type

What to collect and how is it used?

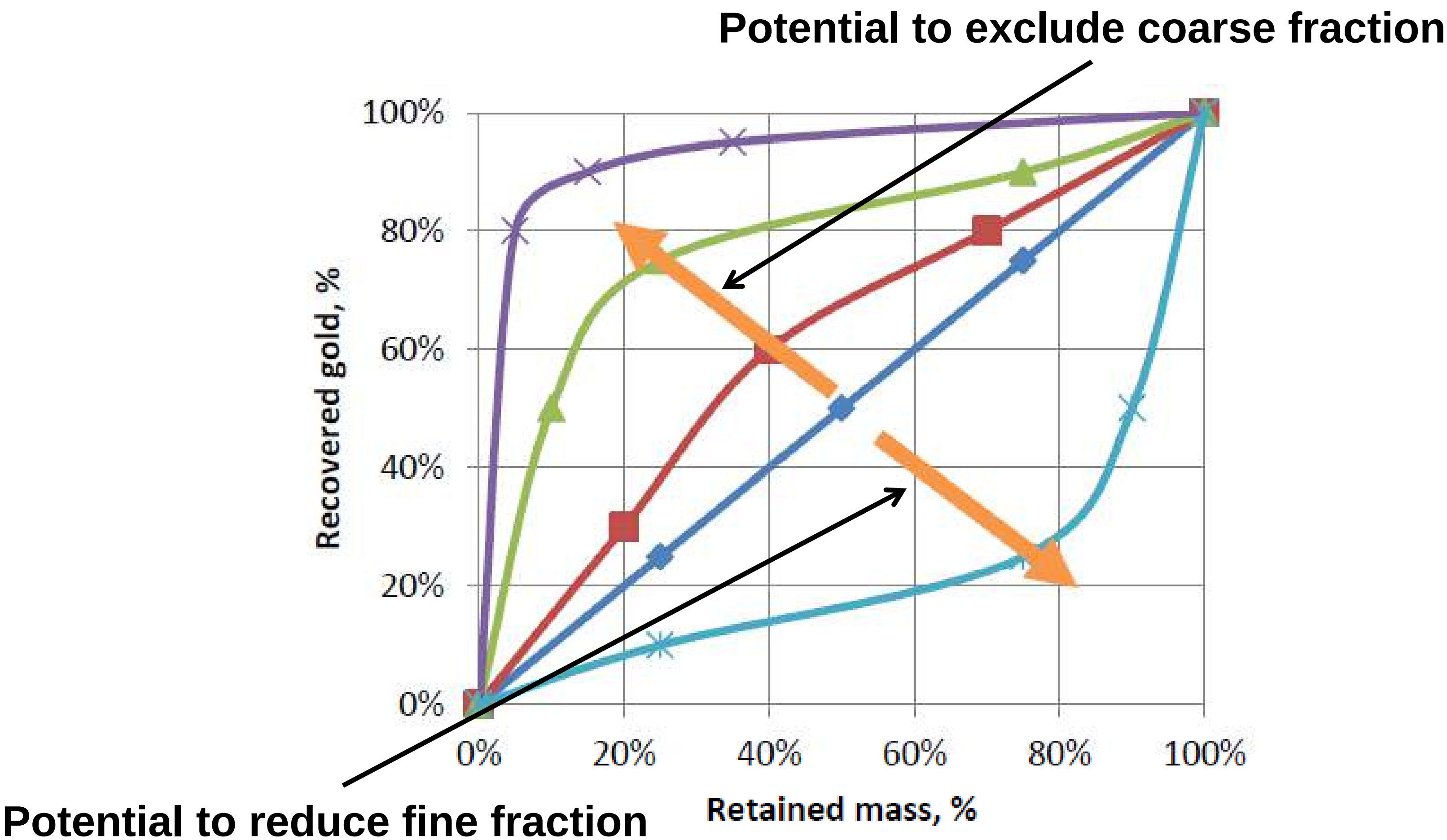
Mining Interest:

- Hardness
- Fragmentation
- Diesel / power
- Sulphur - ARD
- Water table

Geotechnical Interest:

- Rock strength
- Rock hardness
- Rock breakage
- Structure
- Fracture count

What to collect and how is it used?



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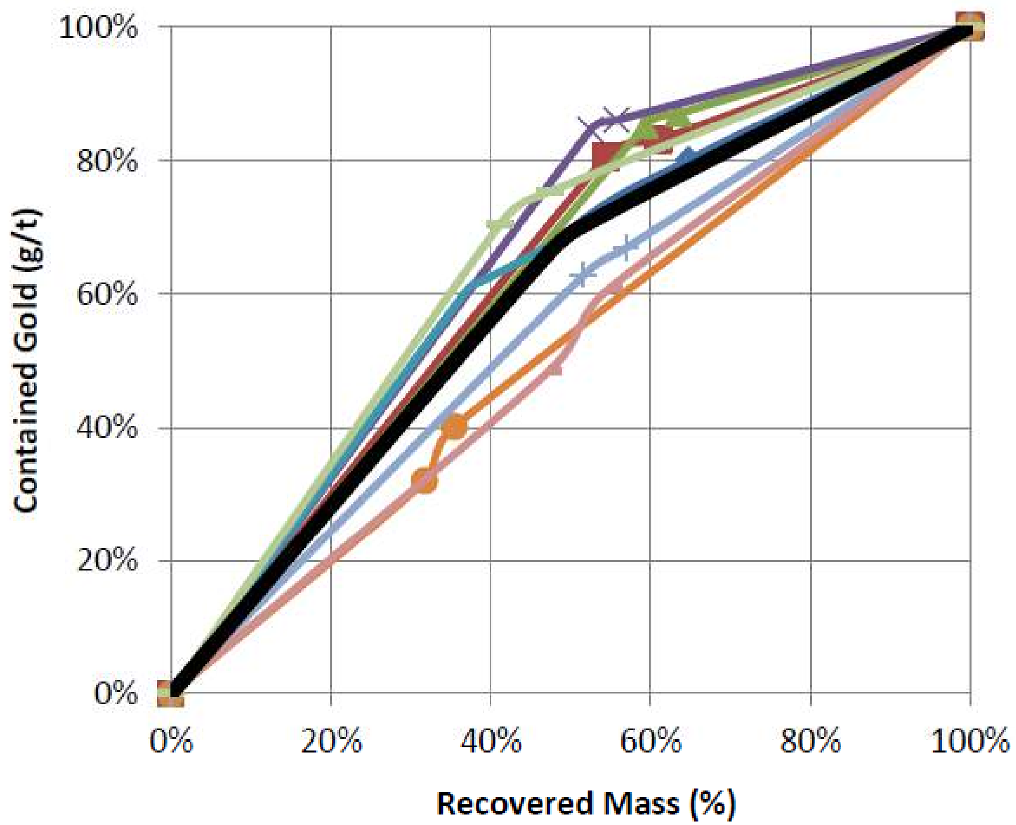

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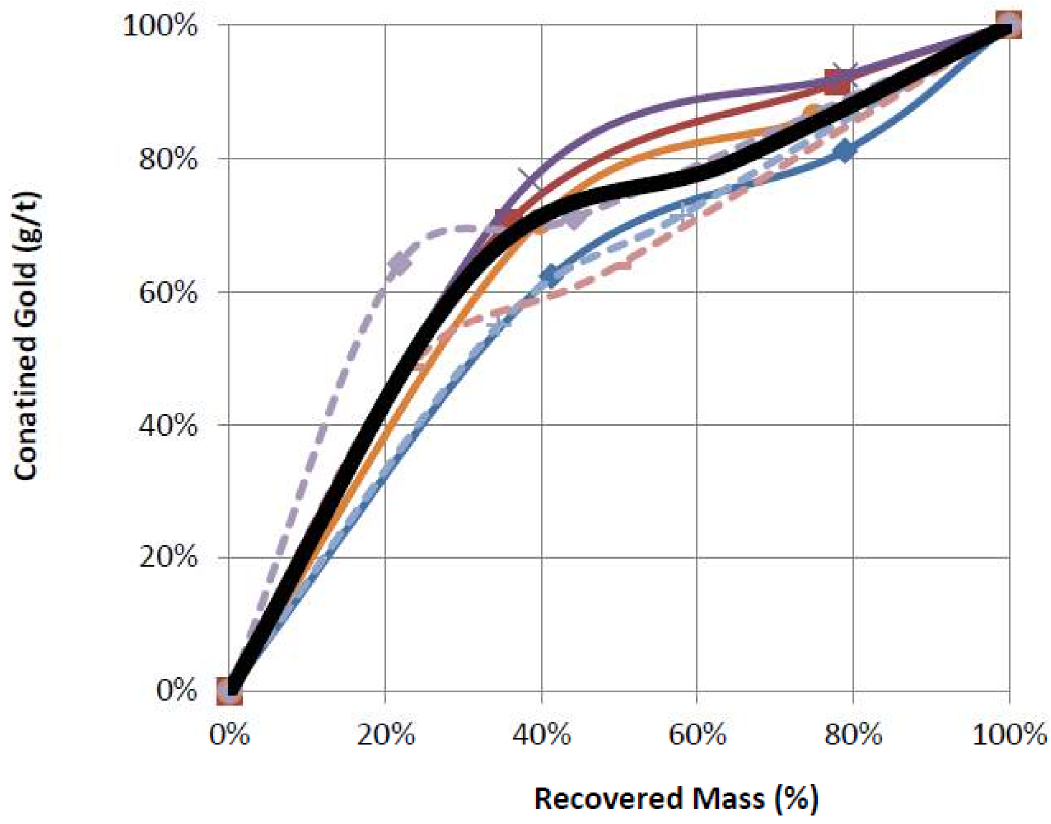

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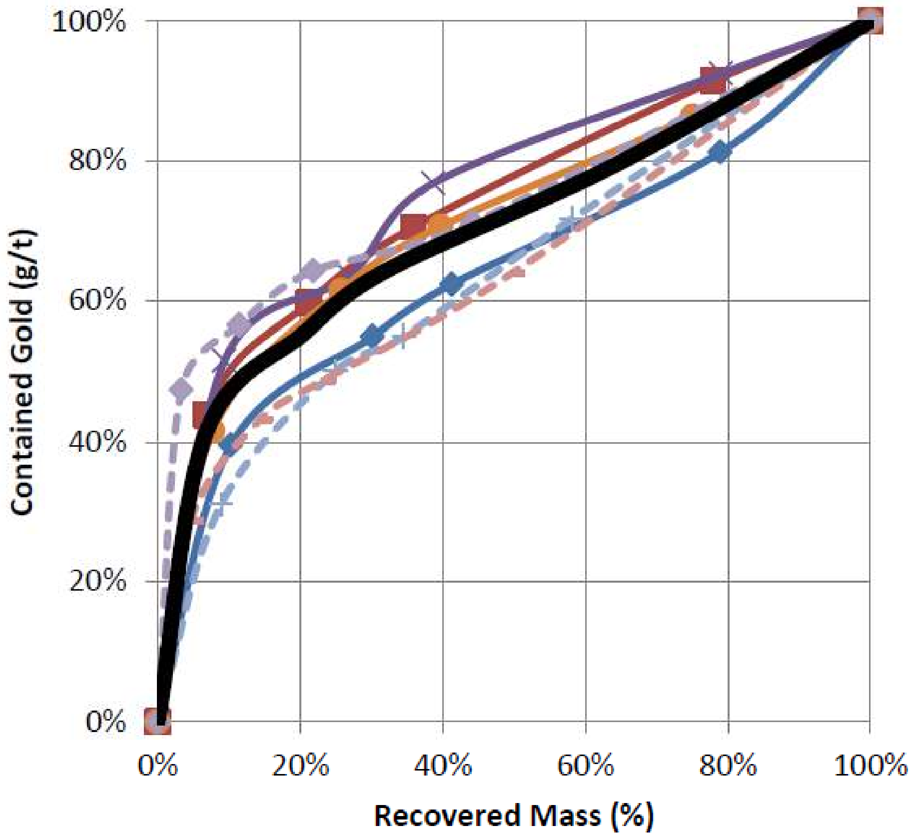


What to collect and how is it used?

Gold associations		Quartz	Sulphides					Carbonaceous material (organic C)	High Ag ores	
Species			chalcopyrite	sec Cu sulphides	pyrrhotite	pyrite	arsenopyrite		electrum; silver sulphides, Pb/Zn sulphides	
CN solubility/consumption			lo	hi	hi	lo	lo		electrum slow leaching; ZnS hi CN consumption	
Other Issues								competes with activated carbon; preg-robbing	Ag not adsorbed onto act C	
Gold Particle Size (liberation)										
coarse	mm's	alluvial: jigs/tables								
medium	100-1000µ	gravity/CIP-CIL (centrifugal)	Flotation +/- CN flot tails	Flotation +/- CN flot tails (NB: CN sol Cu)	gravity/CIP-CIL			gravity / CIL (not CIP)	grav/CIL (electrum); Merril Crowe (Zn precipitation) silver sulphides dominant; Flotation (Pb/Zn)	
fine	40-100µ	CIP/CIL			CIP/CIL Flotation (conc sales eg China)					
ultrafine (may be at grain boundaries)	10-40µ	CIP/CIL			CIP/CIL Flotation + Regrind + Conc CN leach				Hybrid: Flotation (Pb sales)+ regrind Zn conc (py conc) & conc leach	
sub-microscopic	<<10µ					Refractory; pressure oxidation POX (autoclave); or bio-leach				
						Double Refractory (roasting)				
Examples:-		Bendigo/Ballarat, S.Africa	Cu porphyries eg Whistler		sediment-hosted Au	Carlin Trend Nevada (refractory/double refractory)		graphitic shales	epithermal, Mexico / China	
						Processing Options				

What to collect and how is it used?

1. Factors need to be assessed at some time
2. Initial transition between exploration and development
3. Get some data early and then rely on people who have been there before.
4. Without some initial tests the process considerations will go straight to the top of risk list

Topics for today

- Reporting Standards
- The planning cycle
- How geology data is used
- **3D modelling**
- Some examples

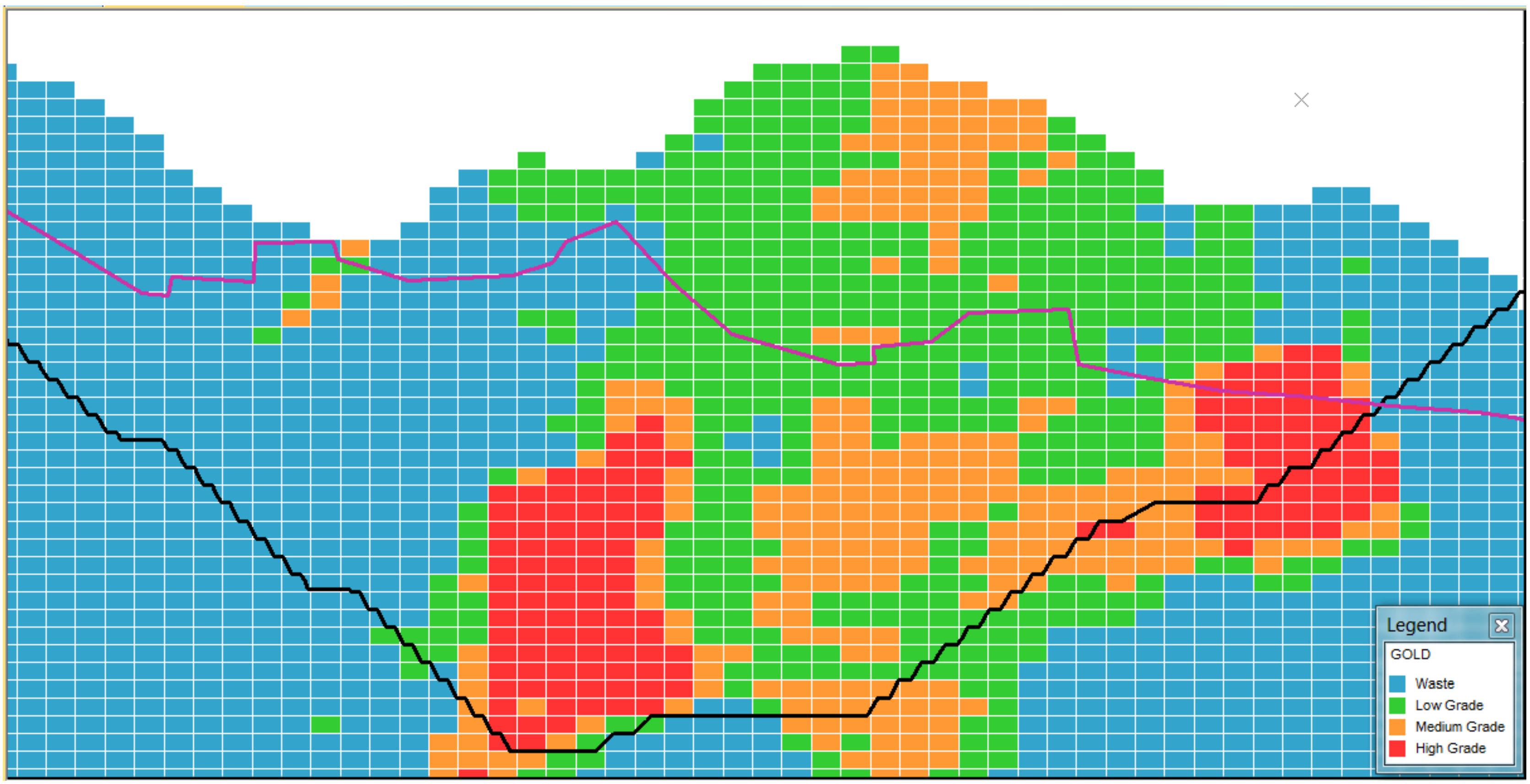
Resource modelling - Considerations

1. Try to get into 3D as soon as possible.
2. Processing parameters also vary within a deposit.
3. Models for process considerations just as important as resource models.
4. Include assessment of all waste materials likely to fall within the pit

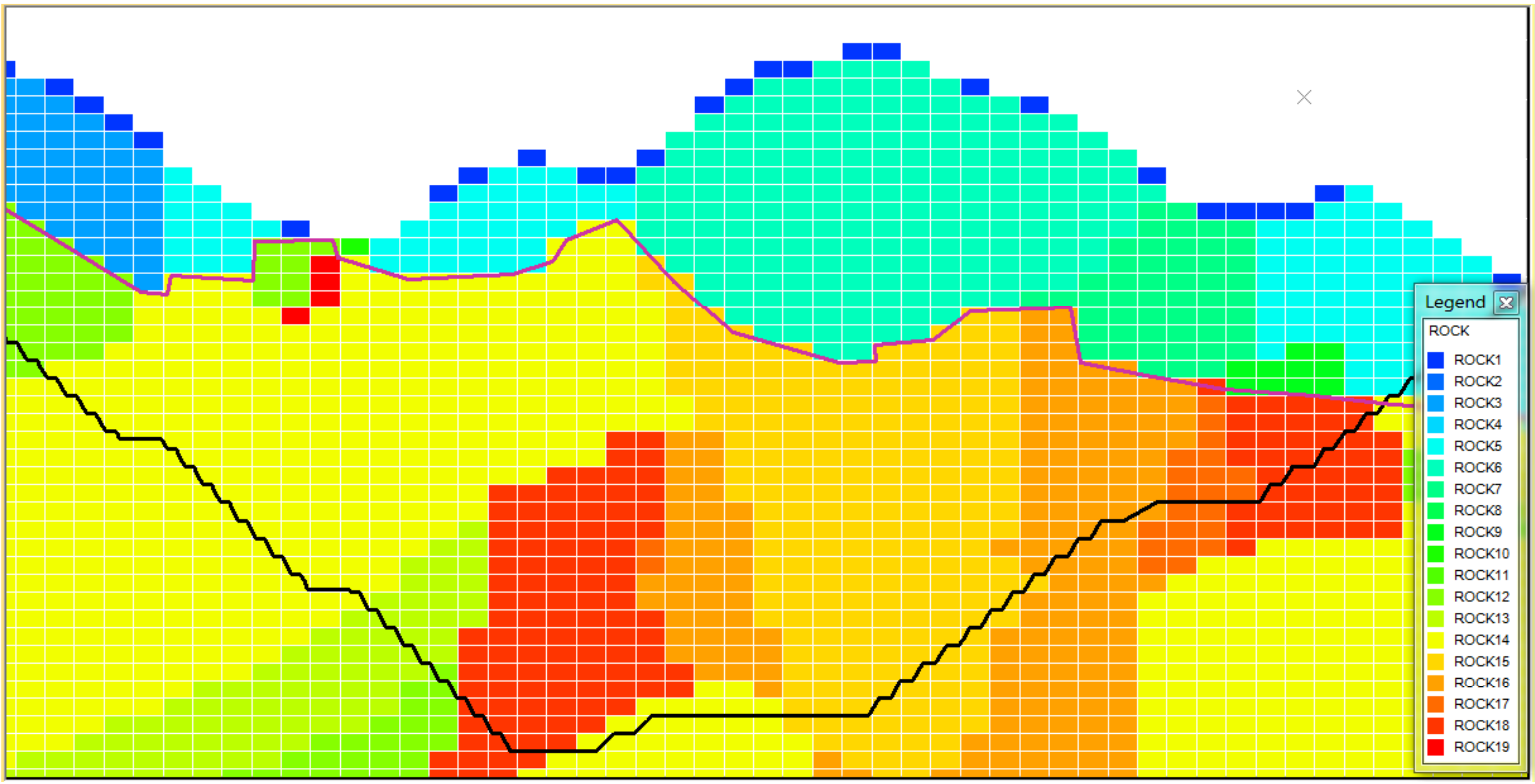
Resource modelling – how much data?

1. Possible to create block models with limited data
2. Use sensitivity to provide limits on the outcomes
3. Use simulation methods to populate from limited data

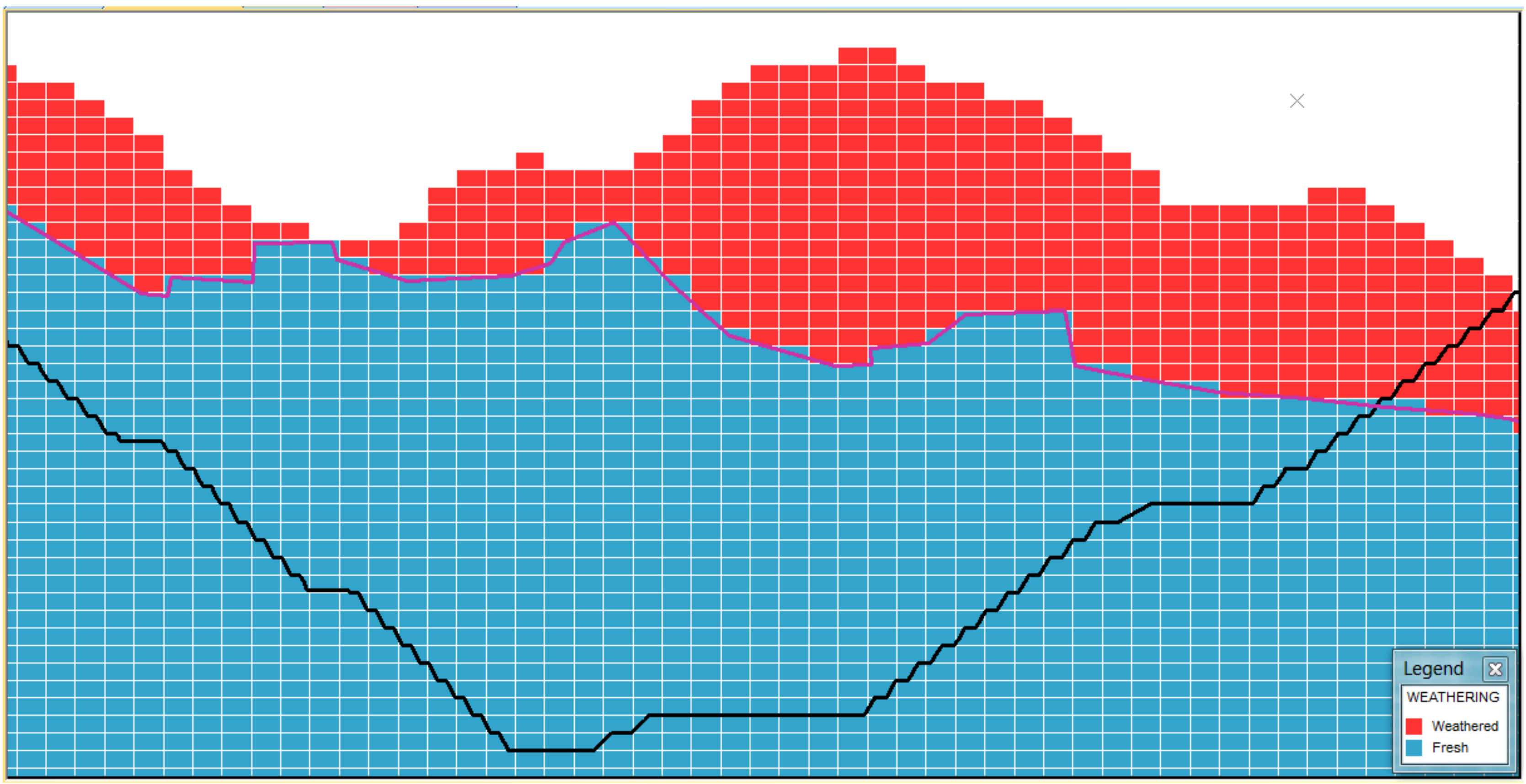
Resource modelling - Grade



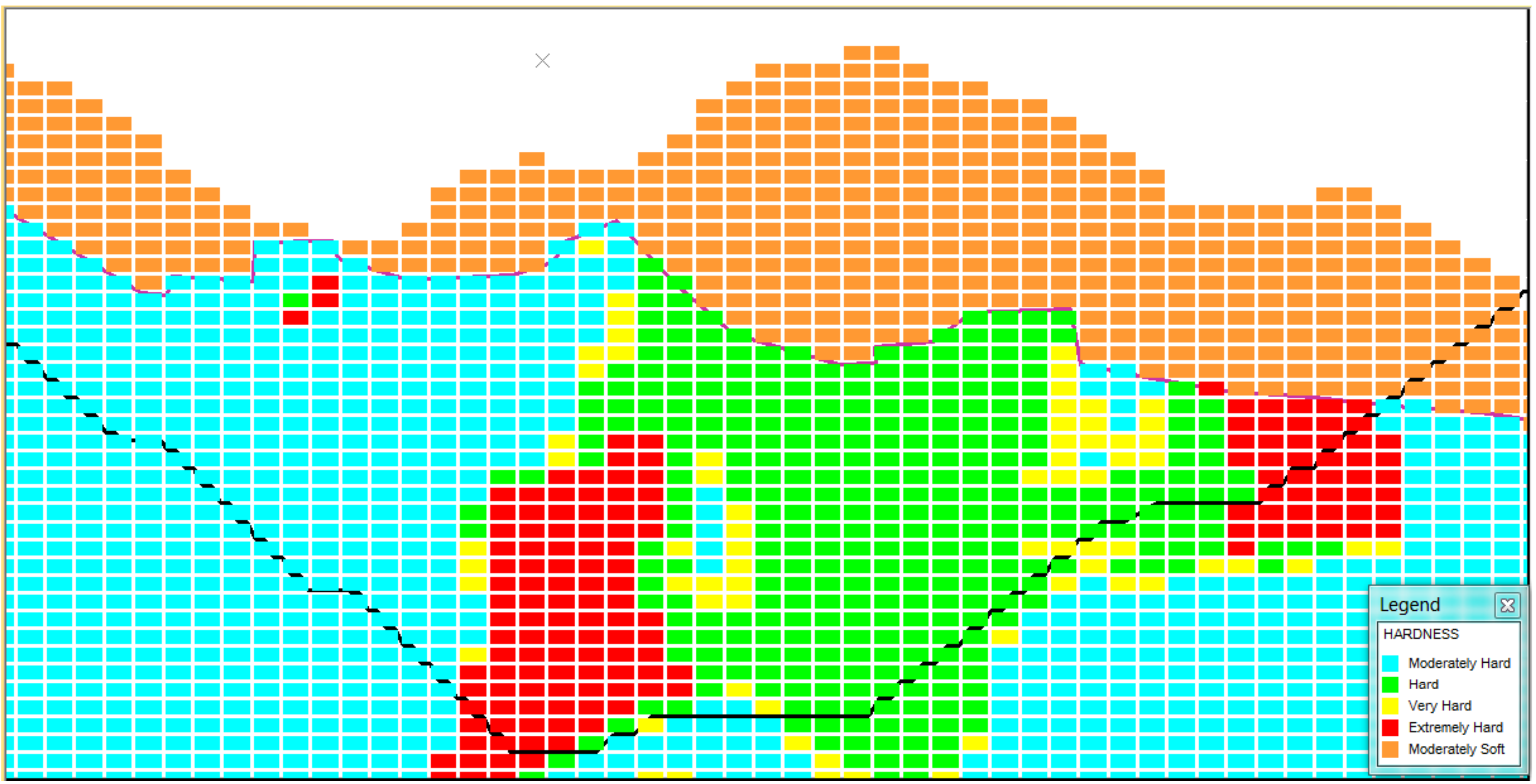
Resource modelling – Rock Type



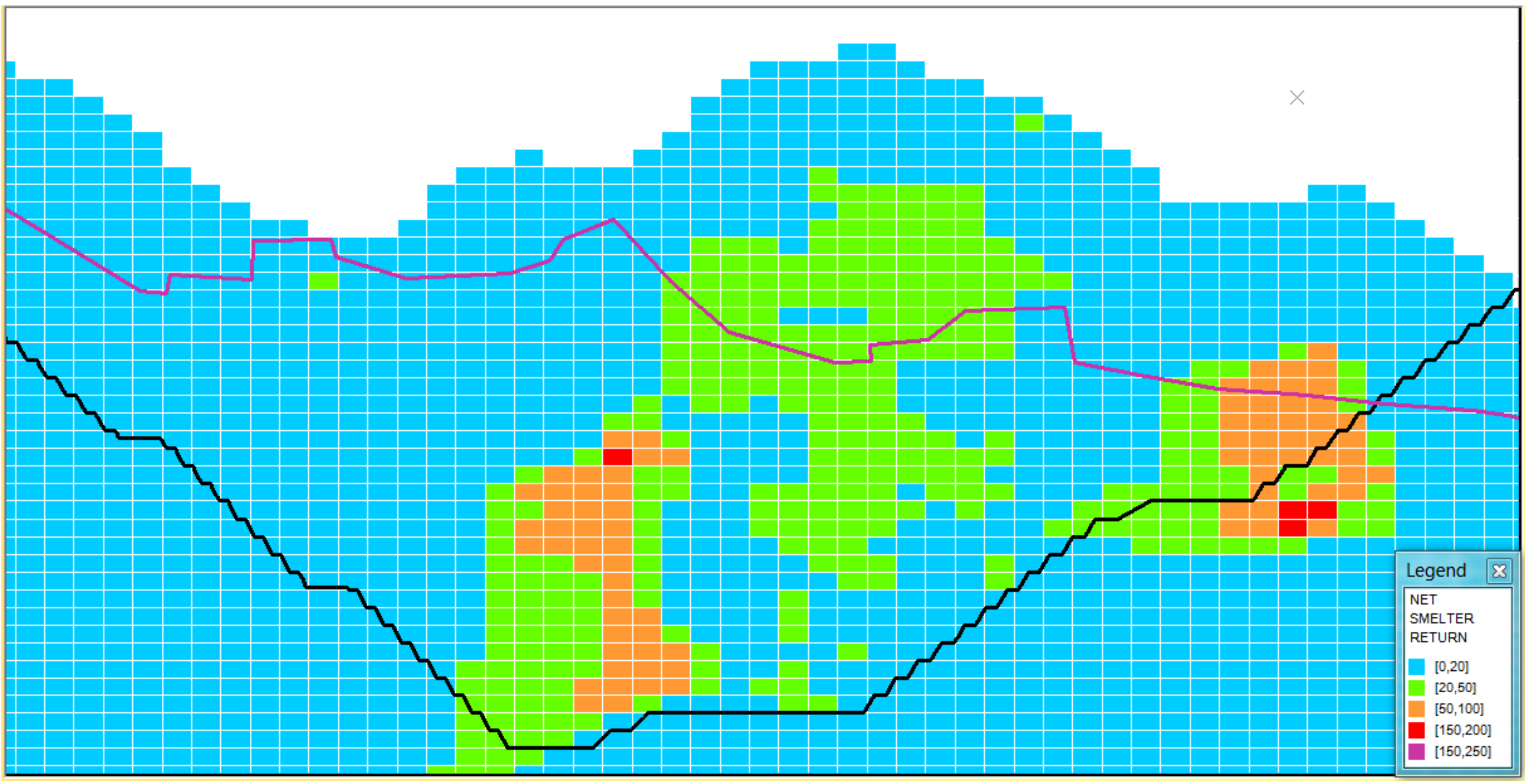
Resource modelling - Weathering



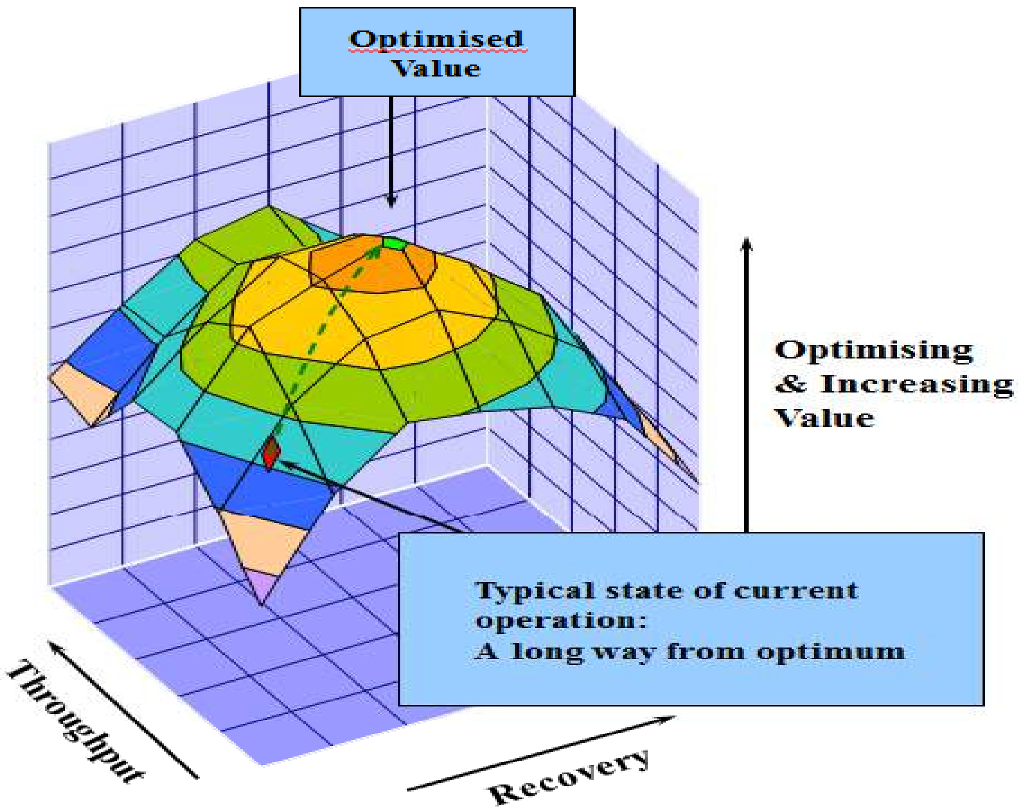
Resource modelling - Hardness



Resource modelling - Value



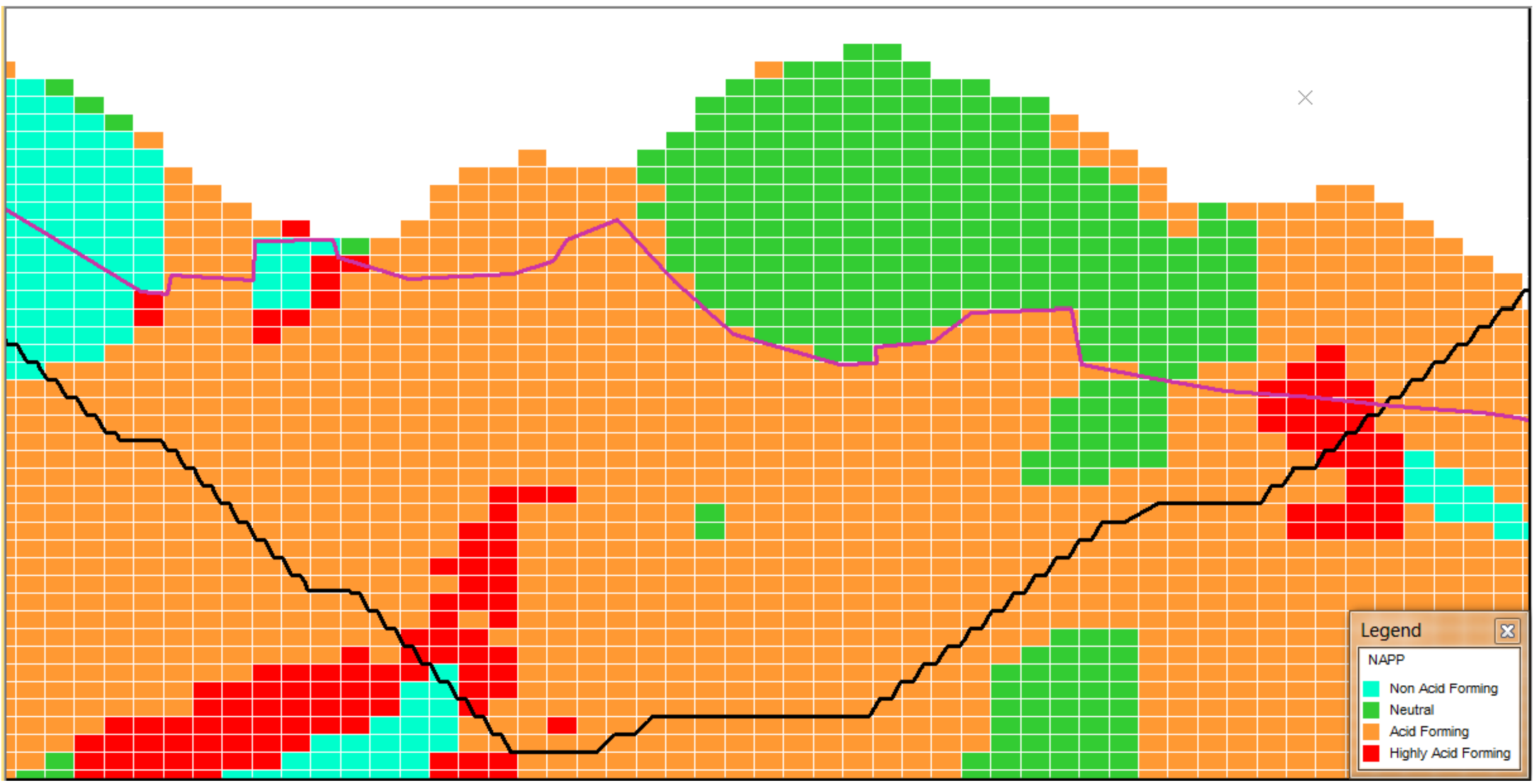
Resource modelling - Strategy



Hill of Value Concept:

- Iterative process
- Assess multiple options
- Focus on costs
- Across all disciplines

Resource modelling - PAF



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- **Some examples**

Examples of what can go wrong?

Some notable disasters from Australia

a. Mt Todd Gold Mine (still closed)

b. Beenup Mineral Sands Mine (still closed)

c. Bulong Nickel Cobalt Mine (running with mods)

d. Ravensthorpe Nickel Cobalt Mine (running with mods)

e. Port Hedland hot briquetted iron plant (still closed)

Examples of successful marriages

Colluli Potash Project

- Had a false start and returned to Scoping level
- Involved mining and processing at scoping study
- Mine and strategic planning done several times already
- Direction for current drilling set by results
- Aim to mitigate all material risks at PFS
- Goal to report a resource and reserve

Conclusions

1. Geologist / metallurgist relationship is one of many
2. Involve all professions early to find threats / opportunities
3. Gather a variety of early data wherever possible
4. Use Scoping Study to define data needed for PFS
5. PFS cost < FS cost – get the data to get PFS right
6. Study Manager needs to know studies not just management
7. We can model anything
8. Get into 3D as soon as possible
9. Think about waste as well as ore

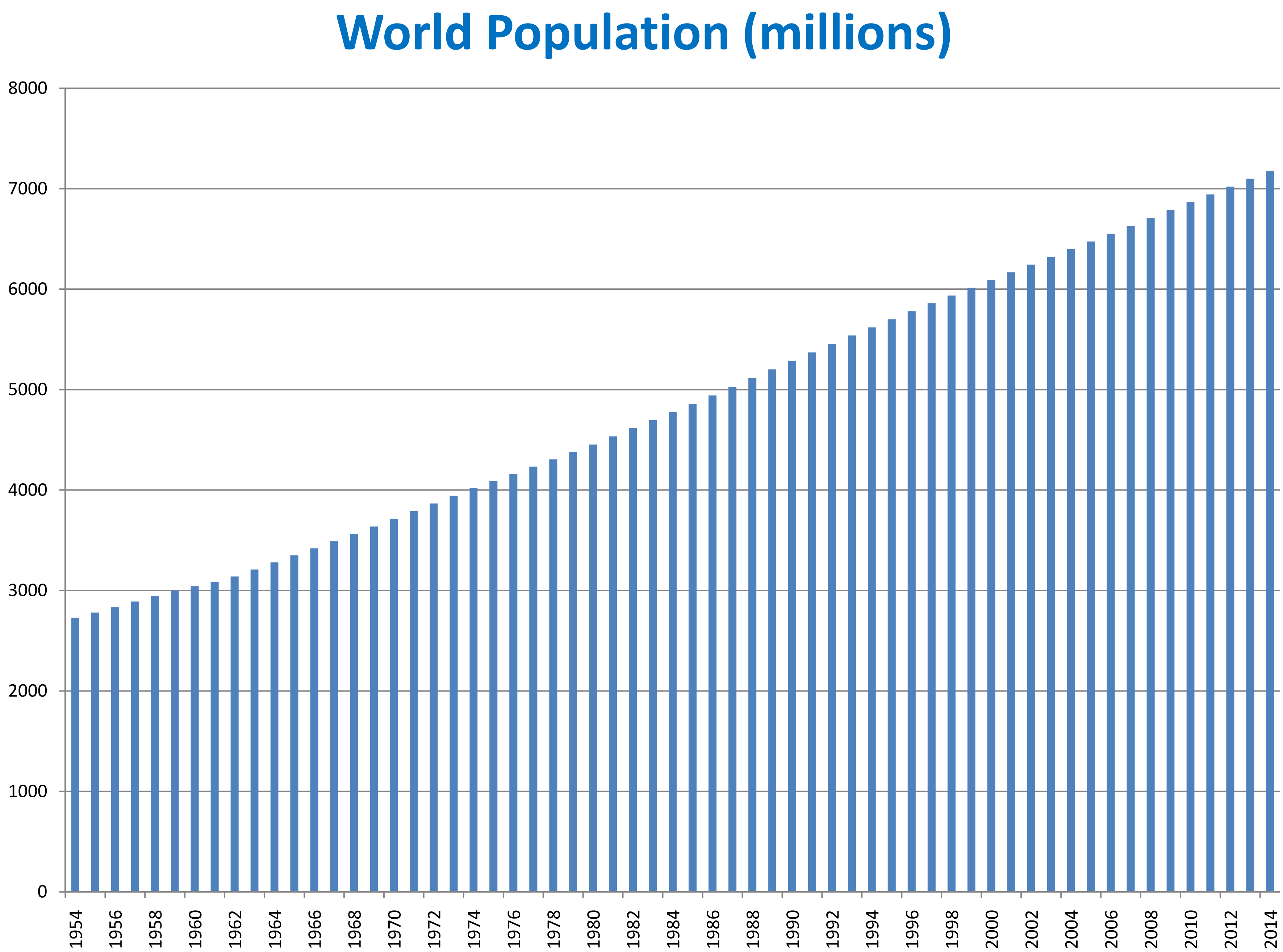
So why am I here??

The State of the Mining Industry

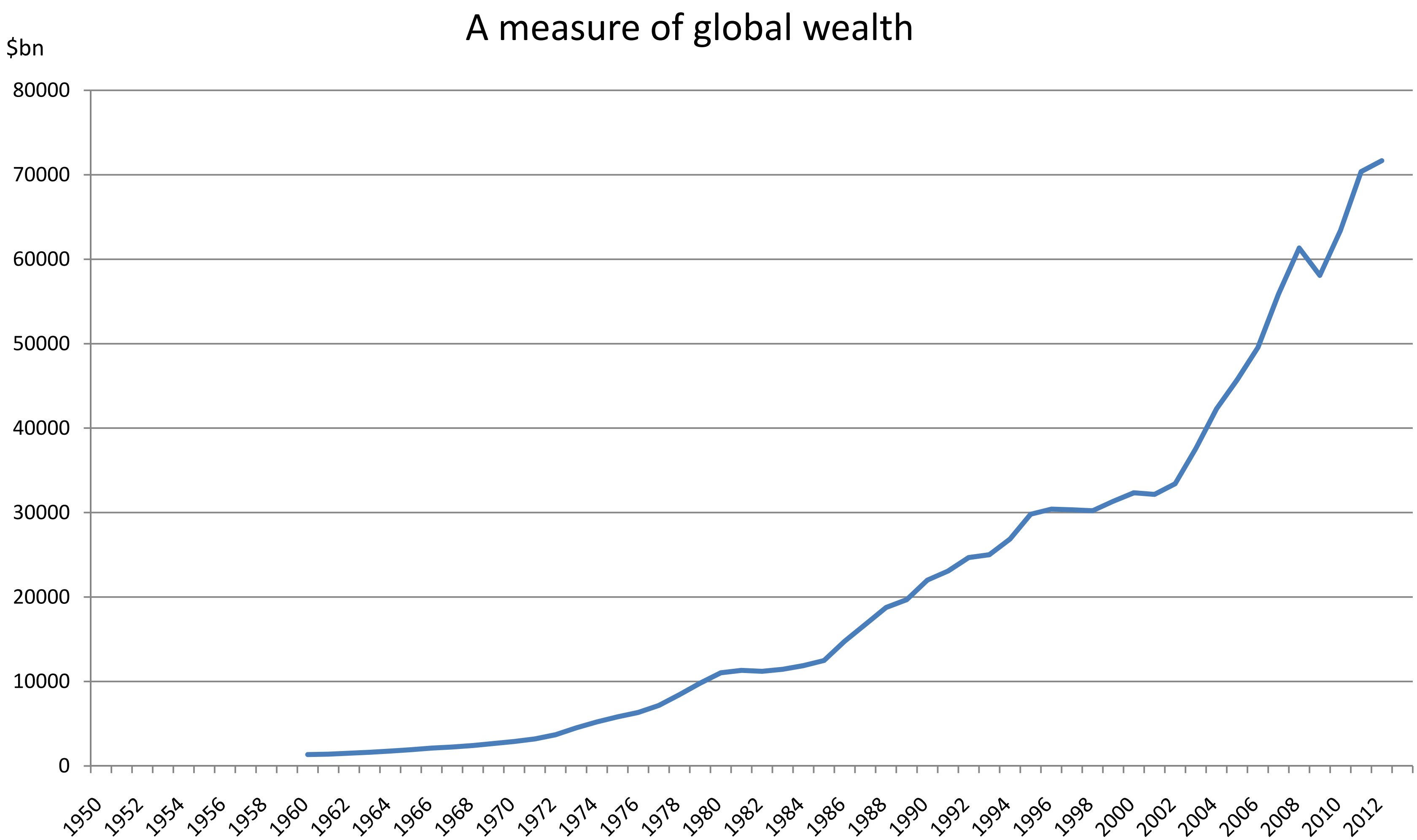
Tim Williams

With apologies and thanks to SP Angel, Reuters, Bloomberg and many others

The Image of Mining


World Population (millions)
8000
7000
6000
5000
4000
3000
2000
1000
0
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014

World GDP (Gross Domestic Product)



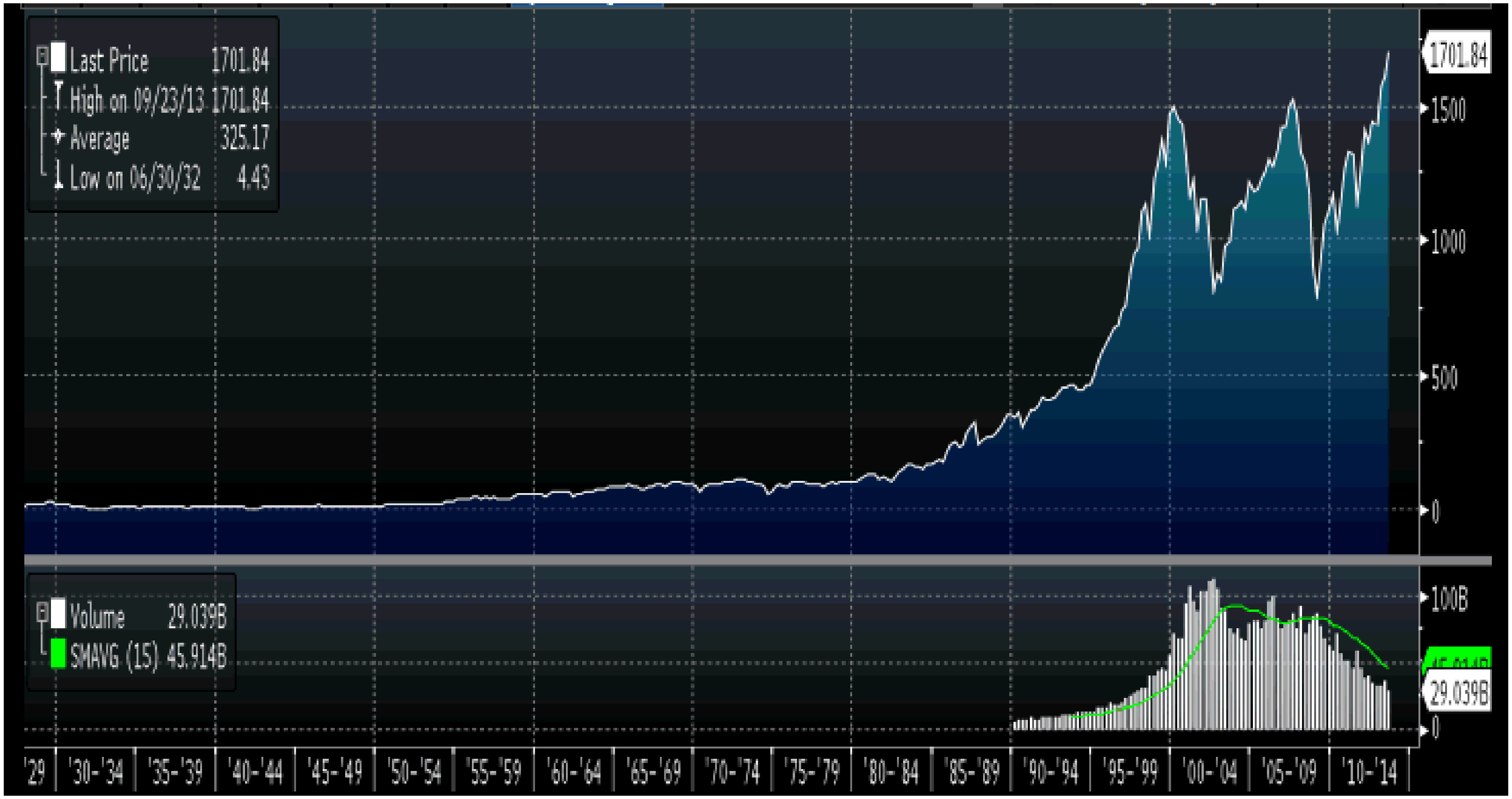
Source: World Bank

World GDP per person

GDP per capita (constant 2005 US$)										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
World	**8,257**	**8,557**	**8,832**	**9,174**	**9,541**	**9,669**	**9,487**	**9,848**	**10,102**	**10,282**

Source: Bloomberg

Standard & Poor S&P 500 Index



Source: Bloomberg

Mining Industry Characteristics: Structural

- Hazardous - safety
- Primary industry
- Energy intensive
- Immobile
- Wasting assets – ore depletion
- Environmental impact
- Remote locations
- Infrastructure dependent
- Water
- Skilled labour

The goose that lays the golden eggs?

The State of the Mining Industry

- **Good!**
  - World population is steadily growing
  - China is industrialising
  - Global per capita GDP is increasing
  - The mining industry is generously providing for the needs of the world
  - Mining generates great benefits for the producing countries and their people
  - Long term projections of most commodities predict better prices
  - Producing mining companies are (mostly) doing well
  - The current slight problems are only cyclical features

The State of the Mining Industry

- **Bad!**
  - Stock markets have lost confidence in the industry
  - Investors are fed up with the inefficiencies of the "junior" exploration companies:

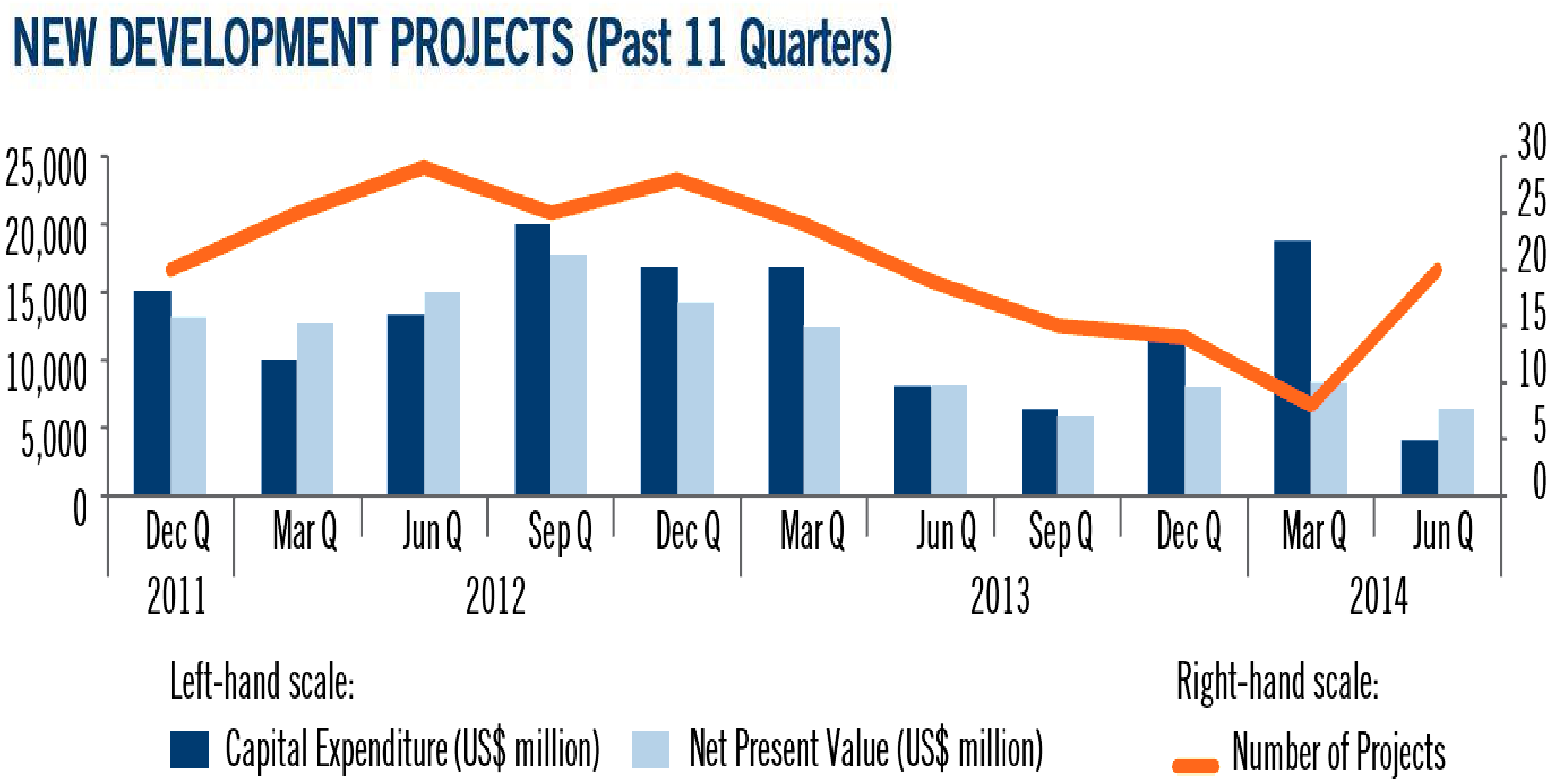
    high overheads with low quality projects
  - Investors are angry at the waste of money by the "major" mining companies :

    terrible acquisitions, and overproduction
  - Credit squeeze is hitting new mining very hard
  - Exploration model has collapsed:

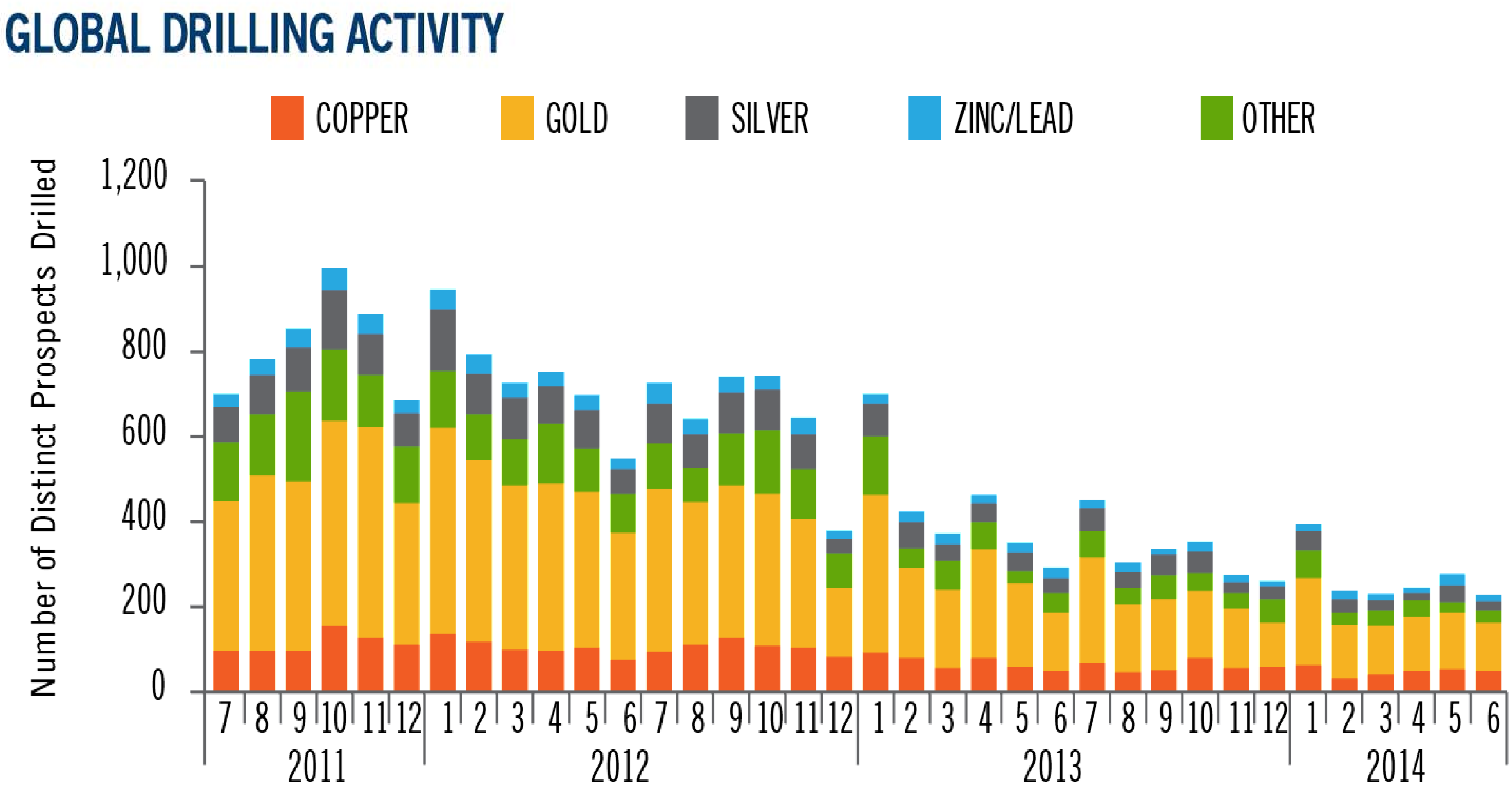
    "find and sell" – but there are no buyers!
  - The "gold mining premium" has disappeared
  - But cheer up it could be worse: "It's looking better"

Mining bad, mineral exploration worse

Mineral projects are looking bad



Mineral Exploration is very, very depressed

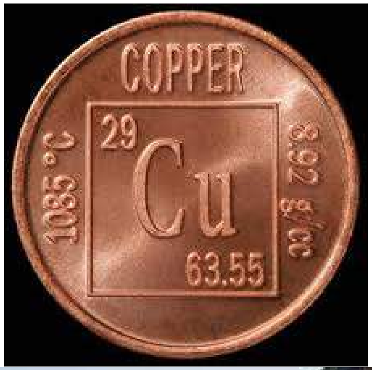


Mining Industry Characteristics: Financial

- Capital intensive: access to sufficient capital
- Very long lead times
  - Discount rates don't seem to work properly
- Price-takers not price-makers (mostly): some can be hedged out
- Highly cyclical supply/demand balances
  - Normal business cycle
  - Mining manias/despairs
- Price risks from
  - substitution
  - recycling
  - thrifting
- Cost risks from
  - Depletion
  - Input costs – labour, energy, steel, equipment
- Price and market risks due to technological advances
- Resource nationalism

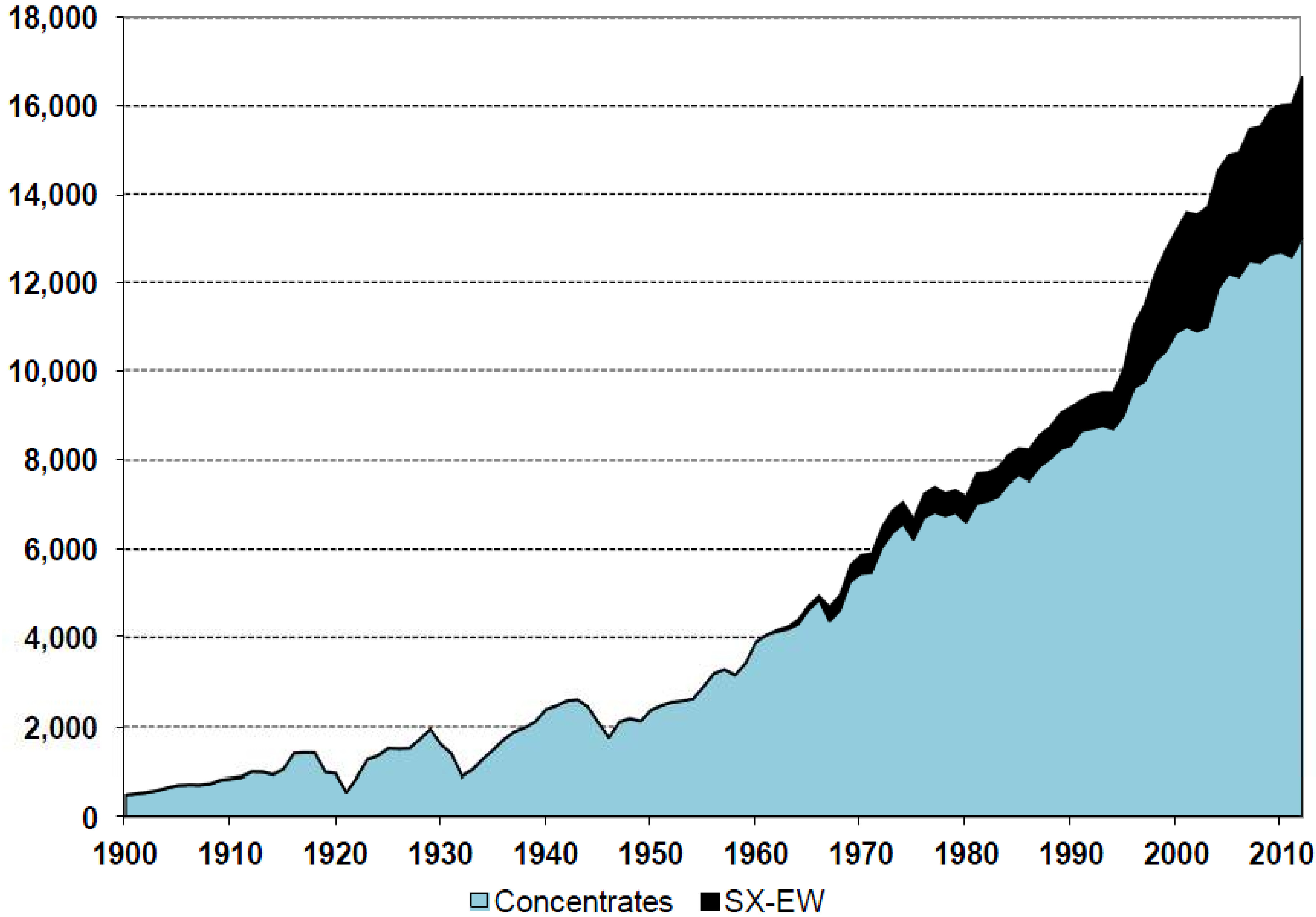
Structure of the industry

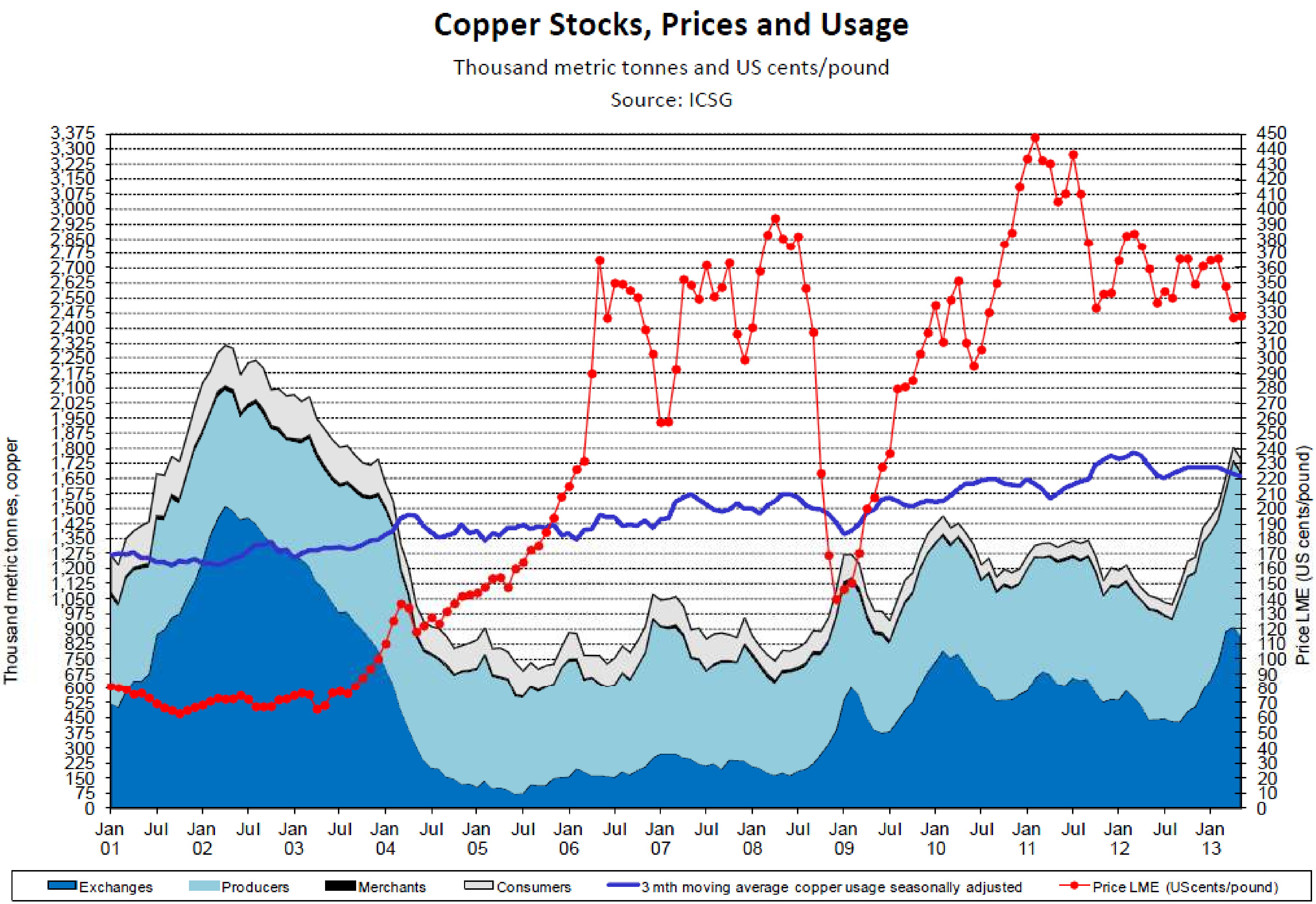
- **“Majors”**
  - Big diversified mining companies
  - Commodity specific mining companies
- **Mid Tier producers**
- **Developers**
  - Typically single project
- **Exploration**
  - Listed “Juniors”
    - TSX-V Toronto Venture Exchange
    - ASX Australian Stock Exchange
    - AIM London Stock Exchange
    - JSE Johannesburg Stock Exchange
  - Private companies – Private capital



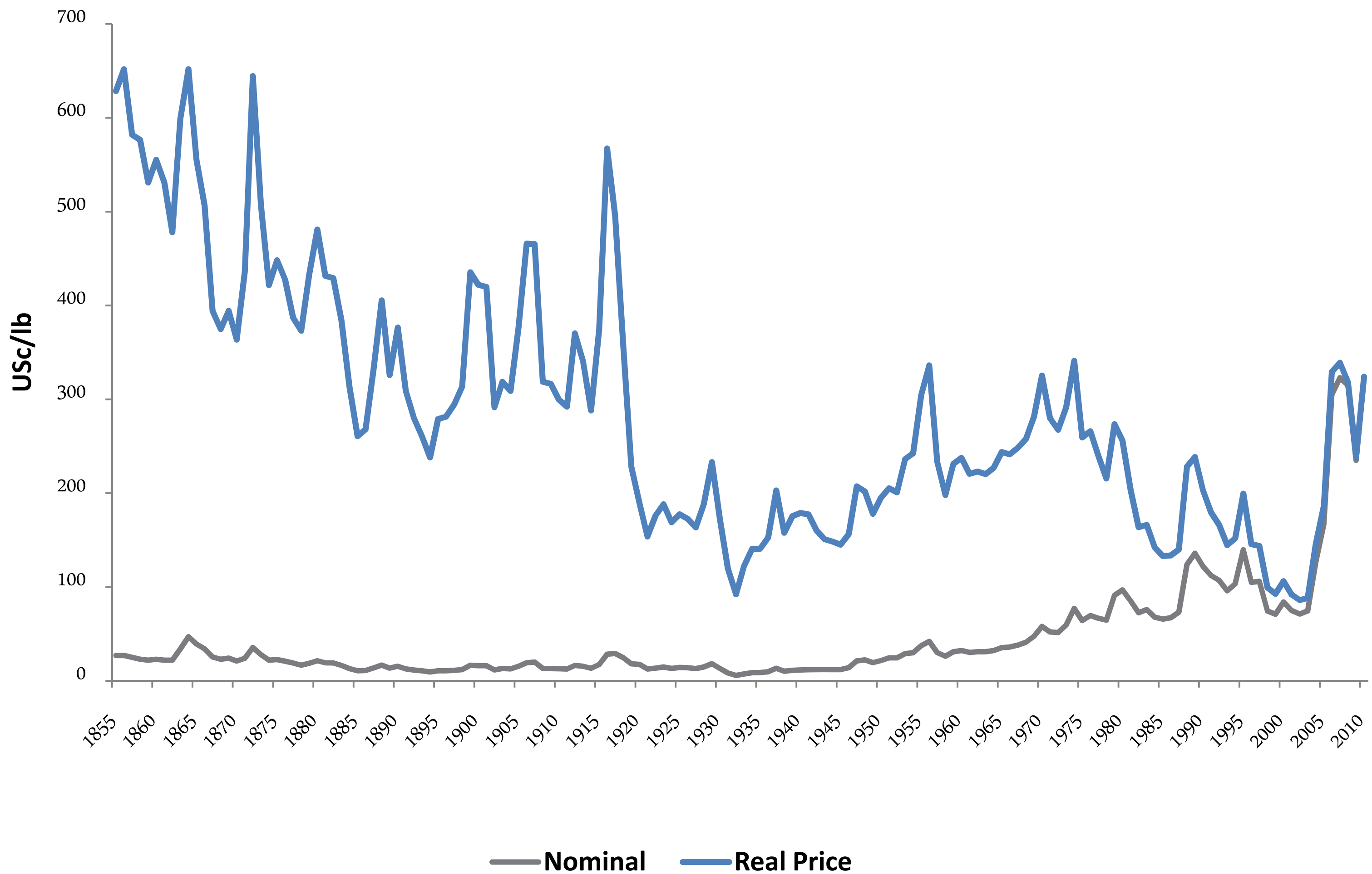
Copper

World copper production since 1900



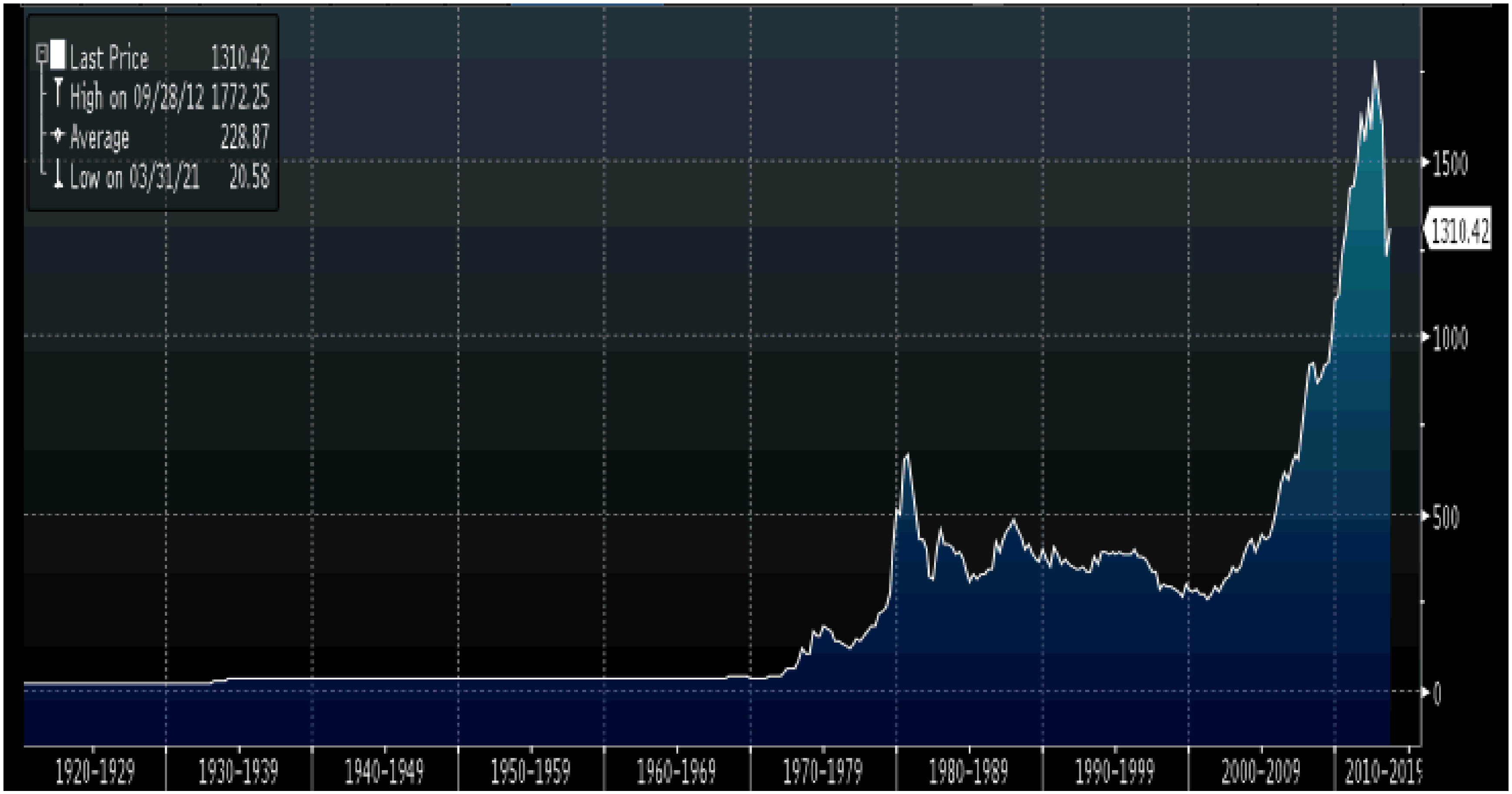

Copper Stocks, Prices and Usage
Thousand metric tonnes and US cents/pound
Source: ICSG
Thousand metric tonnes, copper
Price LME (US cents/pound)
Jan 01
Jul
Jan 02
Jul
Jan 03
Jul
Jan 04
Jul
Jan 05
Jul
Jan 06
Jul
Jan 07
Jul
Jan 08
Jul
Jan 09
Jul
Jan 10
Jul
Jan 11
Jul
Jan 12
Jul
Jan 13
Exchanges
Producers
Merchants
Consumers
3 mth moving average copper usage seasonally adjusted
Price LME (UScents/pound)

Copper price   long term.



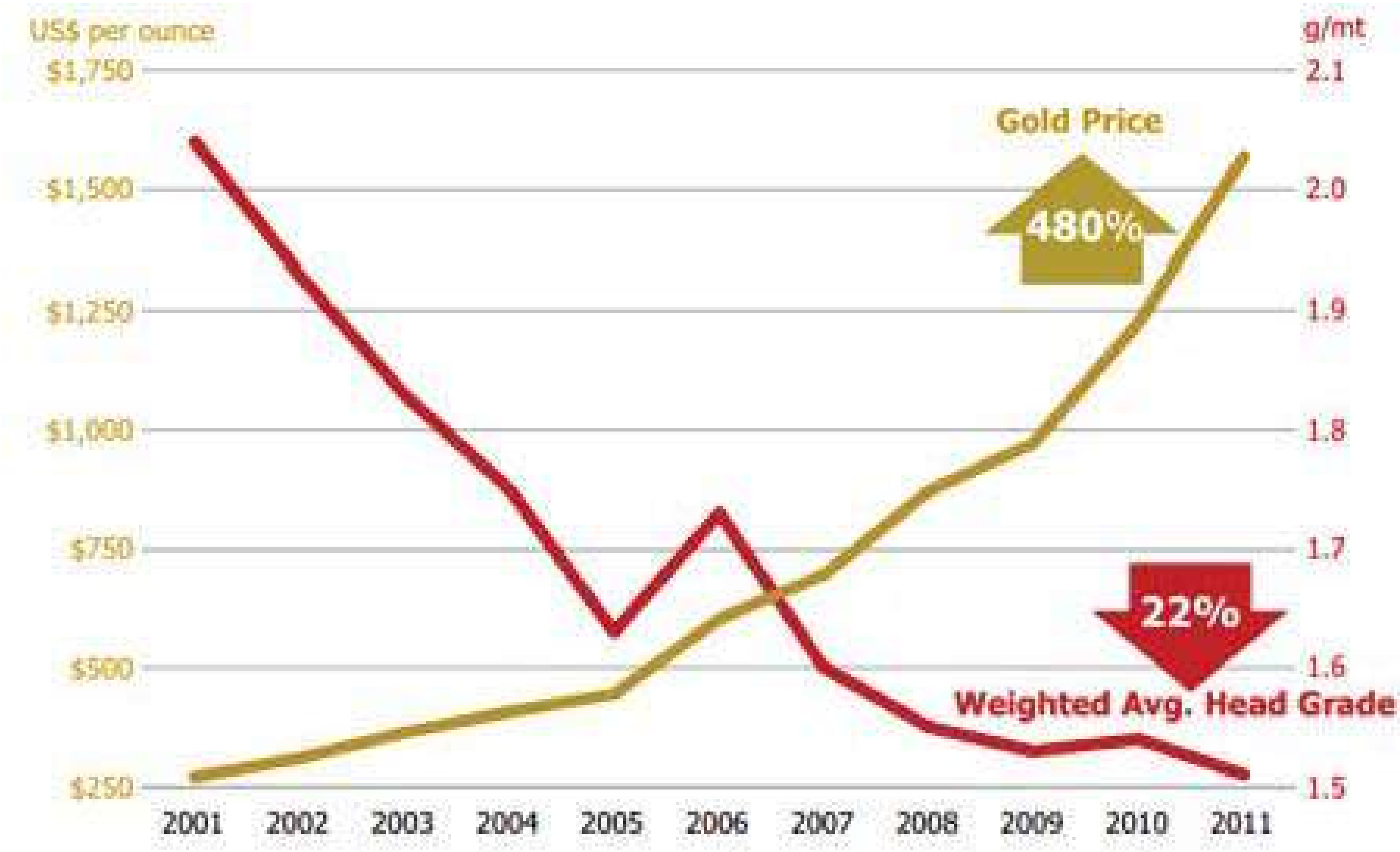
GOLD

Gold Price 1920 2013

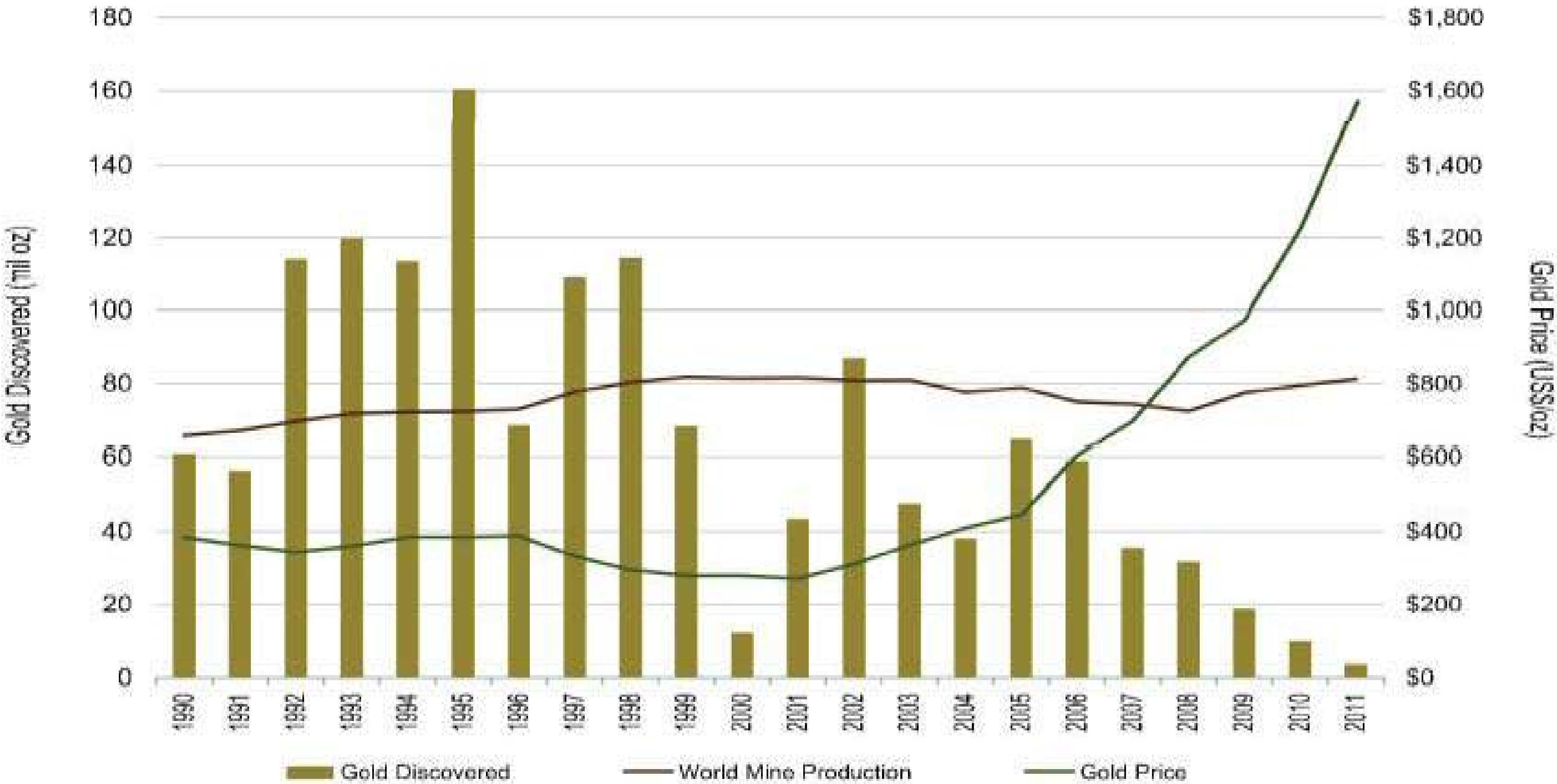


Source: Bloomberg

Gold price up: gold grade down



Not much new gold being discovered



So what does it all mean…#1

- Parkinson’s Law:
  - Work expands to fill the time available.
- Tim’s Law:
  - Mining costs expand to fill the revenue available.

So what does it all mean…#2

- Warren Buffet:
  - When the tide goes out we find out who has been swimming naked.
- Tim:
  - When the metal price falls we find out who has been mining the market.

Free Advice: How to get zero mine tax

- 1. Set mining tax at 0%
- 2. Set mining tax at 100%

Better to find the right level?

How to encourage a mining industry

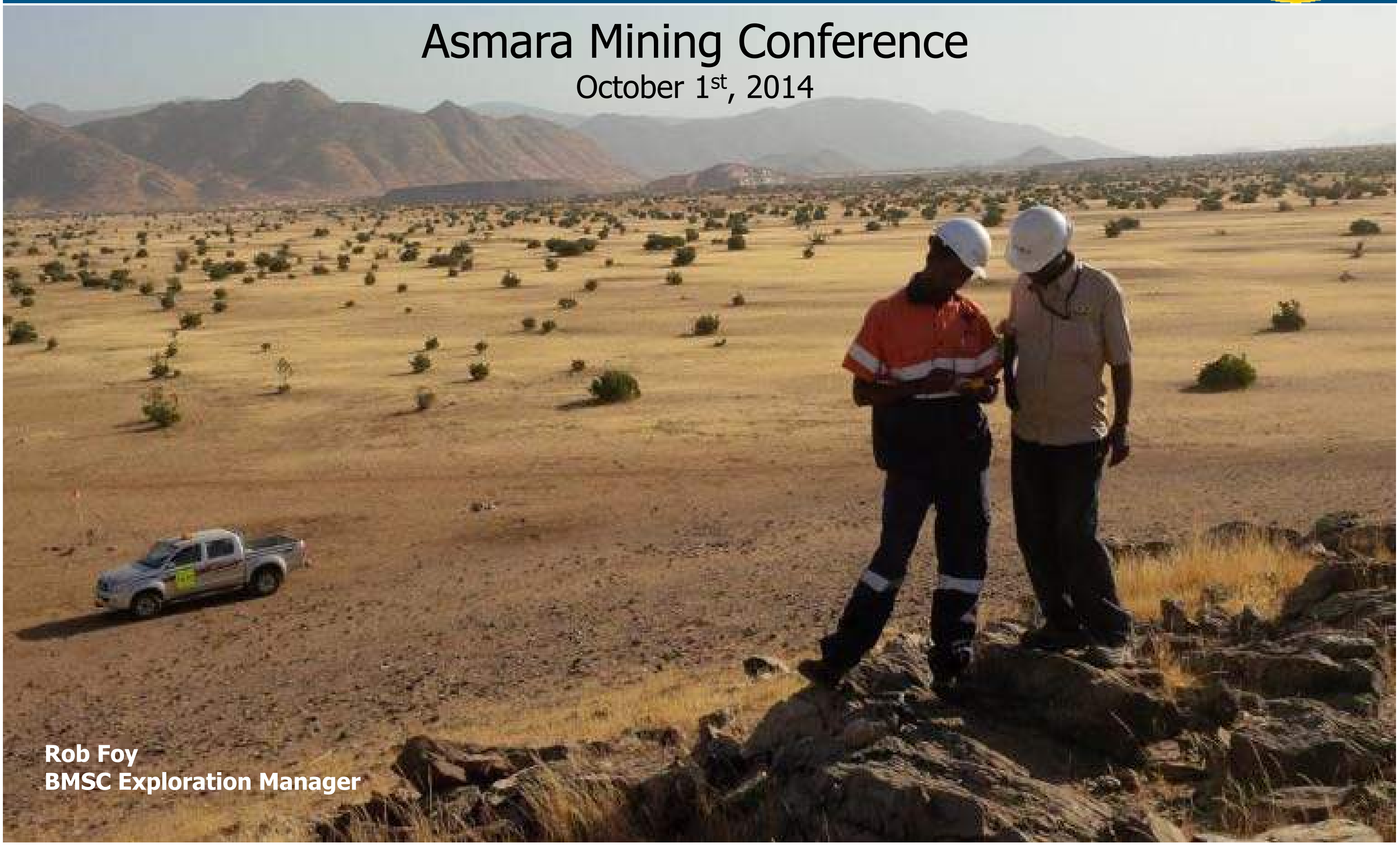
(full disclosure: by an interested party)

- Have a clear and fair mining code and obey it
- Look after that goose
- **Don't tax exploration!**

Thank you

2014 BISHA MINING EXPLORATION
An OVERVIEW

Asmara Mining Conference
October 1st, 2014



Rob Foy
BMSC Exploration Manager

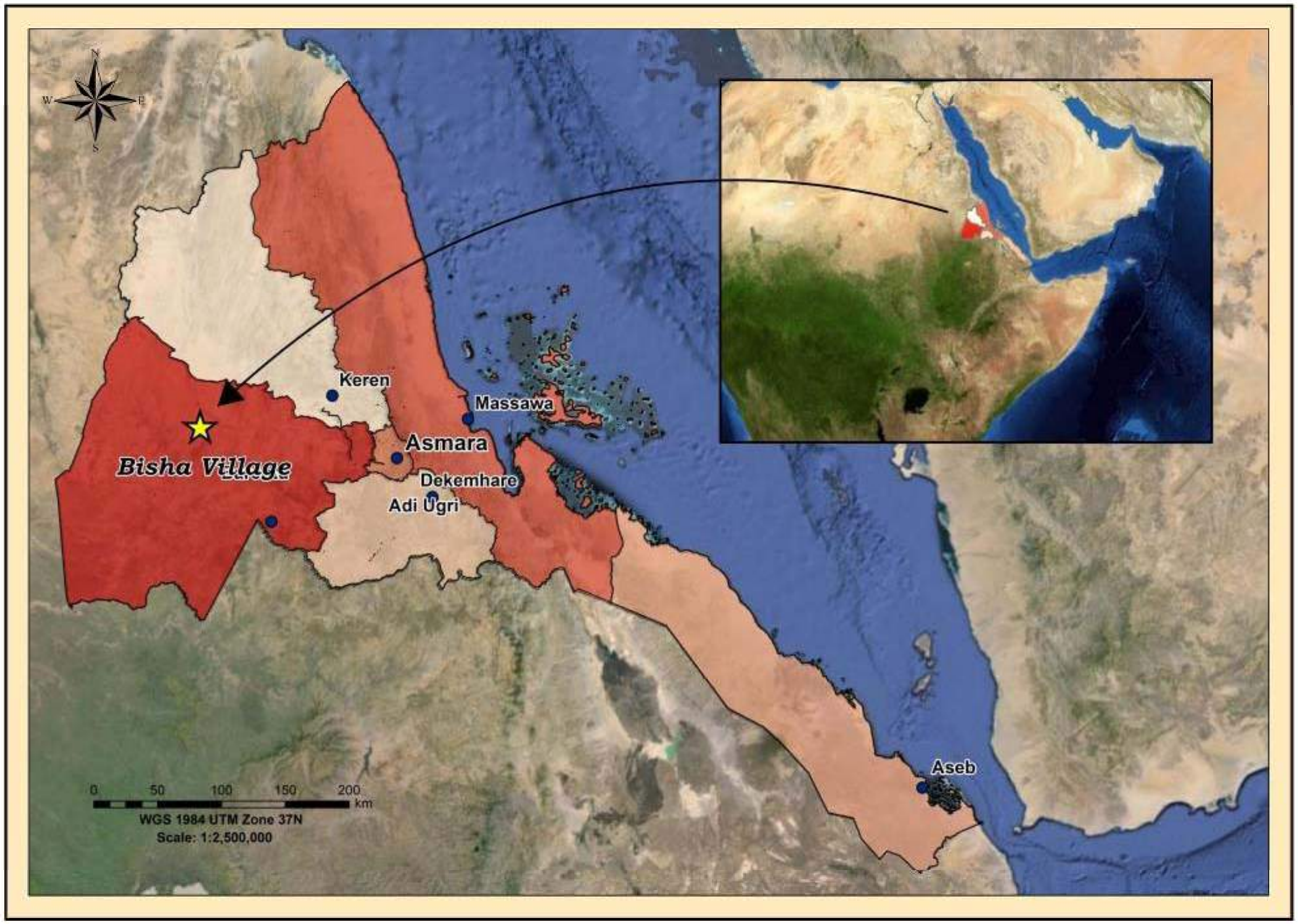
FORWARD LOOKING STATEMENTS

This Presentation contains forward-looking statements within the meaning of the United States Private Securities Litigation Reform Act of 1995 and applicable Canadian securities legislation concerning anticipated developments on the Company's continuing and future operations in Eritrea, the adequacy of the Company's financial resources and financial projections. Forward-looking statements include, but are not limited to, statements concerning or the assumptions related to estimates of capital and operating costs, the timing, nature and extent of future copper, zinc and gold production, expanding exploration licenses, the estimation of mineral reserves and resources, methodologies and models used to prepare resource and reserve estimates, the realization of mineral reserve estimates, the conversion of mineral properties to reserves and resources, the potential to expand resources, reserves and mine life, future exploration budgets, plans, targets and work programs, capital expenditures and objectives, anticipated timing of grant of permits, mining and development plans and activities, construction and production targets and timetables, grades, processing rates, life of mine, net cash flows, metal prices, exchange rates, reclamation costs, results of drill programs, dividend plans and policy, litigation matters, integration or expansion of operations, requirements for additional capital, government regulation of mining operations, environmental risks, political risks and uncertainties, unanticipated reclamation expenses, and other events or conditions that may occur in the future. Forward-looking statements are frequently, but not always, identified by words such as "expects," "anticipates," "believes,“ "intends," "estimated," "potential," "possible", "budget" and similar expressions, or statements that events, conditions or results "will," "may,“ "could" or "should" occur or be achieved. Information concerning the interpretation of drill results and mineral resource and mineral reserve estimates also may be deemed to be forward-looking statements, as such information constitutes a prediction of what mineralization might be found to be present if and when a project is actually developed, and in the case of mineral reserves, such statements reflect the conclusion based on certain assumptions that the mineral deposit can be economically exploited.

Forward-looking statements are statements about the future and are inherently uncertain, and actual achievements of the Company or other future events or conditions may differ materially from those reflected in the forward-looking statements due to a variety of risks, uncertainties and other factors. Although the Company has attempted to identify important factors that could cause actual results to differ materially from those contained in forward-looking statements, there may be other factors that cause results not to be as anticipated, estimated or intended. The Company's forward-looking statements are based on the beliefs, expectations and opinions of management on the date the statements are made and the Company assumes no obligation to update such forward-looking statements in the future, except as required by law. There can be no assurance that such statements will prove to be accurate, as actual results and future events could differ materially from those anticipated in such statements. For the reasons set forth above, investors should not place undue reliance on forward-looking statements.

Please see the Company's Annual Information Form and Management Discussion and Analysis of BMSC for a more complete discussion of the risk factors associated with our business which have been filed with Canadian securities regulators and are available at www.sedar.com, which have also been filed or submitted to the U.S. Securities and Exchange Commission on Form 40-F or Form 6-K and are available at www.sec.gov .

LOCATION MAP

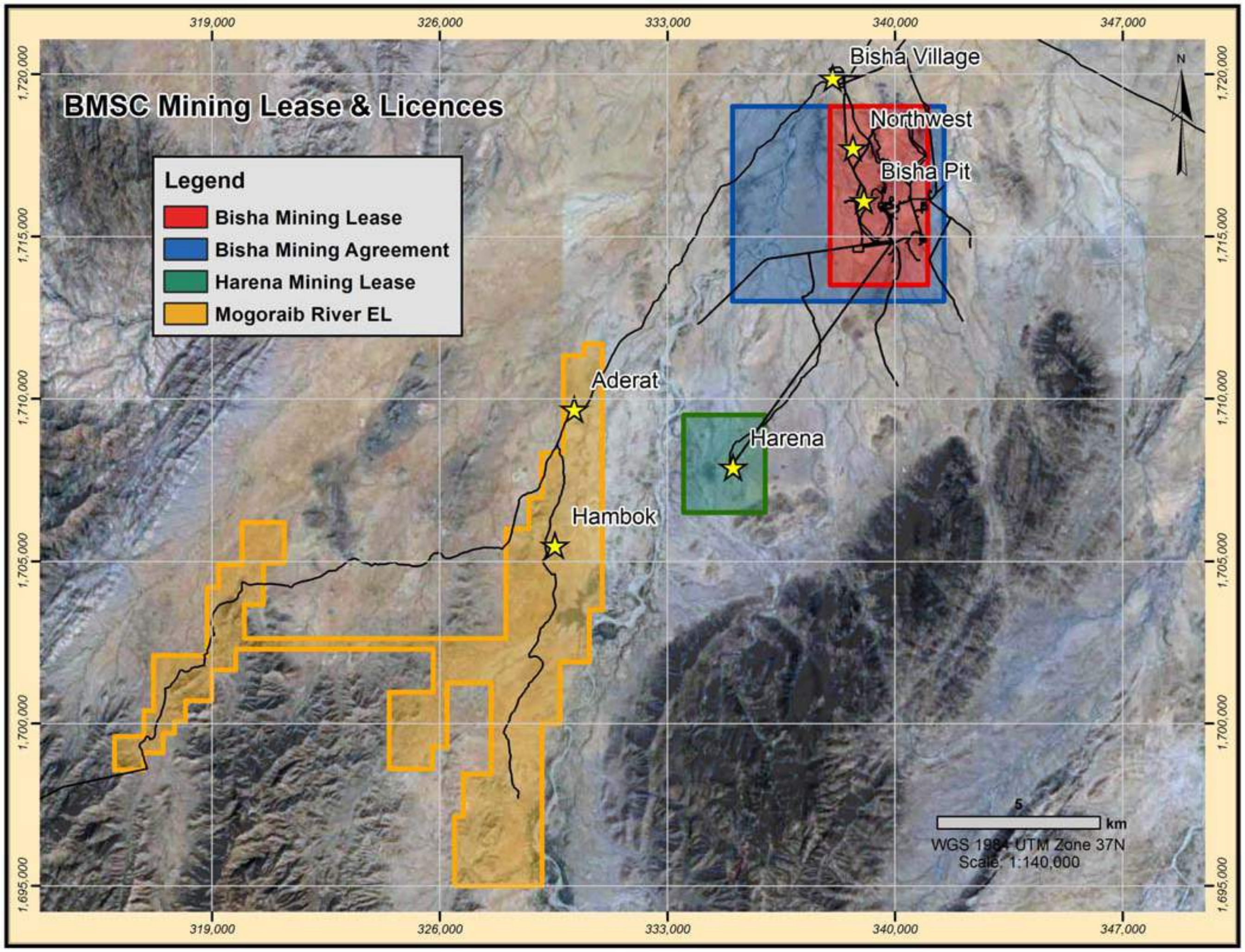


150km W of Asmara - 232km by road

Gash – Barka District - Western Nakfa Terrain

"Everyone going home safe and healthy everyday"

PROPERTY MAP



"Everyone going home safe and healthy everyday"

EXPLORATION HISTORY

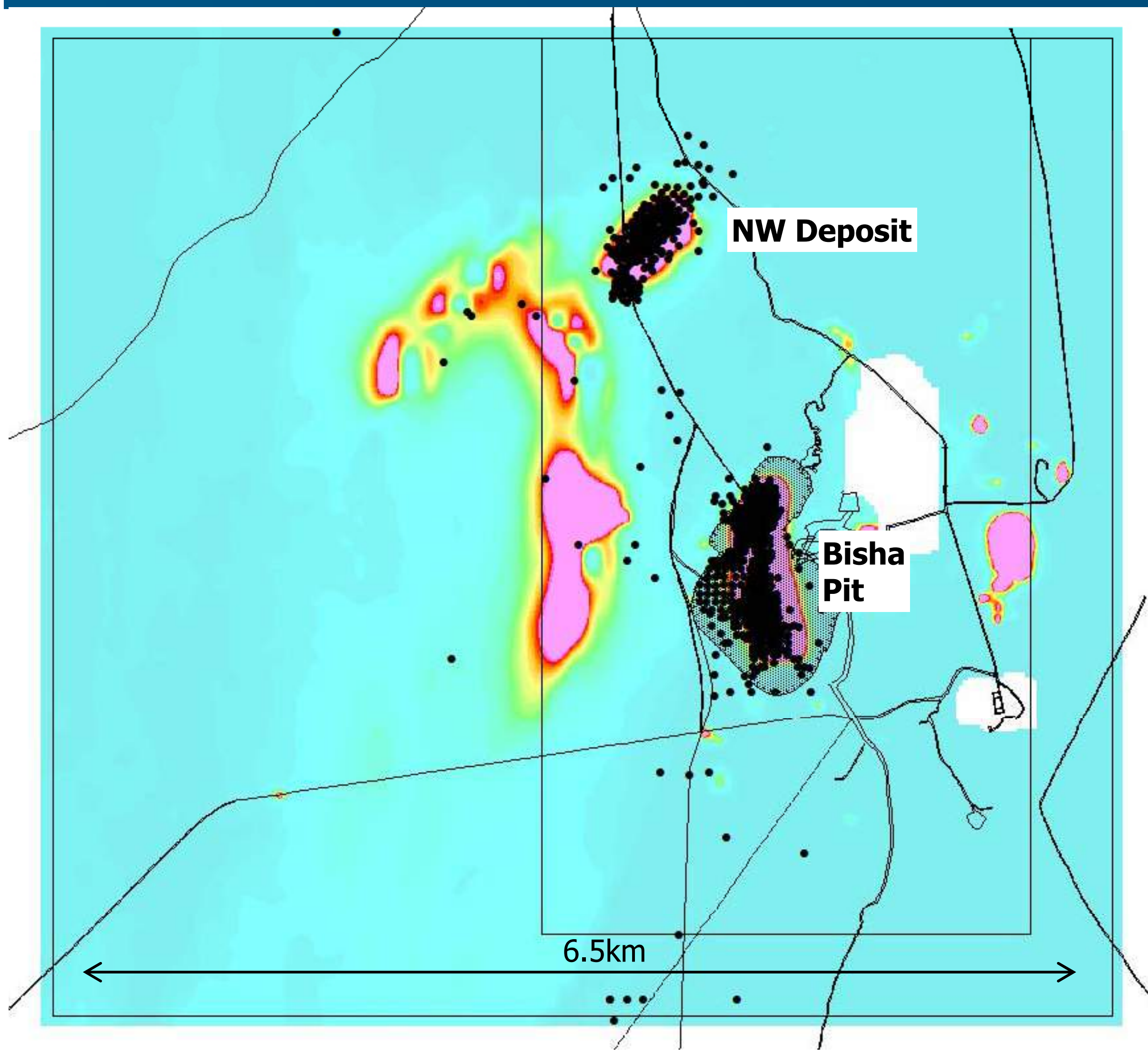
		Geol. Mapping	Streams Soils	AEM	HLEM	TEM	MAG	Gravity	IP	DDH Exploration	DDH Total
Ophir Ventures Regional Grassroots Exploration	1996										
Nevsun Granted Exploration License	1998										
	1999	X	X		X						
	2002	X								6	6
Bisha Main Recognized	2003	X	X	X	X	X	X	X		140	140
Mogoraib River Exploration License Granted (Sanu)	2004	X	X			X		X		163	312
Hambok	2005	X			X	X	X	X		105	453
	2006	X	X						X	68	519
Bisha Main Feasibility Study Completed	2007	X						X		16	16
	2008									7	7
	2009	X						X		17	17
Harena	2010							X		15	54
Harena	2011									12	172
Bisha Main First Production	2012	X								33	138
Northwest	2013									35	133
	2014	X		X		X				100	100
										717	2067

"Everyone going home safe and healthy everyday"

2014 EXPLORATION – QUICK FACTS

- 2014 Exploration now Stand-alone Department
- Strong Support from BMSC Board
- USD $9.0Mn Budget
- Properties have "critical mass of data"
- Drilling - ~ 100 diamond drill hole
- Geophysics – airborne, ground, borehole EM
- Targets – greenfields, brownfields, near Mine, Deposit extension
- 2014 – successes at Aderat and Harena

2014 EXPLORATION – AIRBORNE GEOPHYSICS



Bisha Property

2014 AEM VTEM Survey

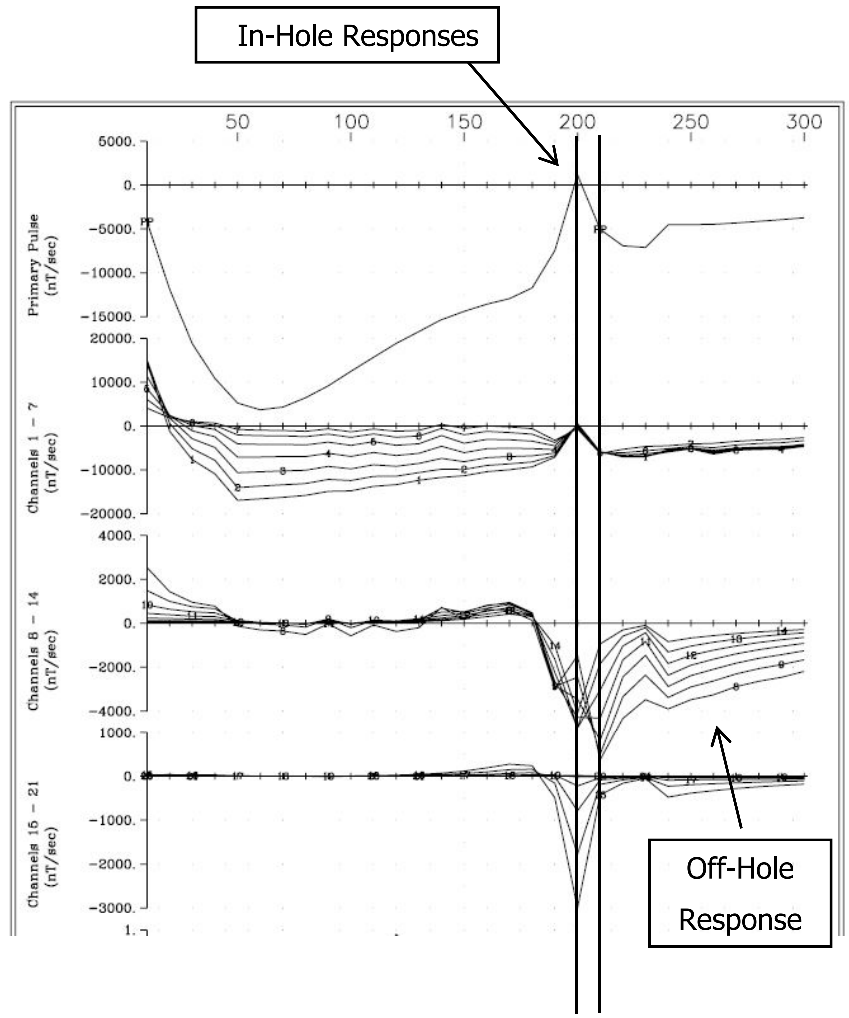
EM Ch 36 coloured

Showing previous drilling

"Everyone going home safe and healthy everyday"

2014 EXPLORATION –
GROUND and BOREHOLE GEOPHYSICS

Setting up Transmitter



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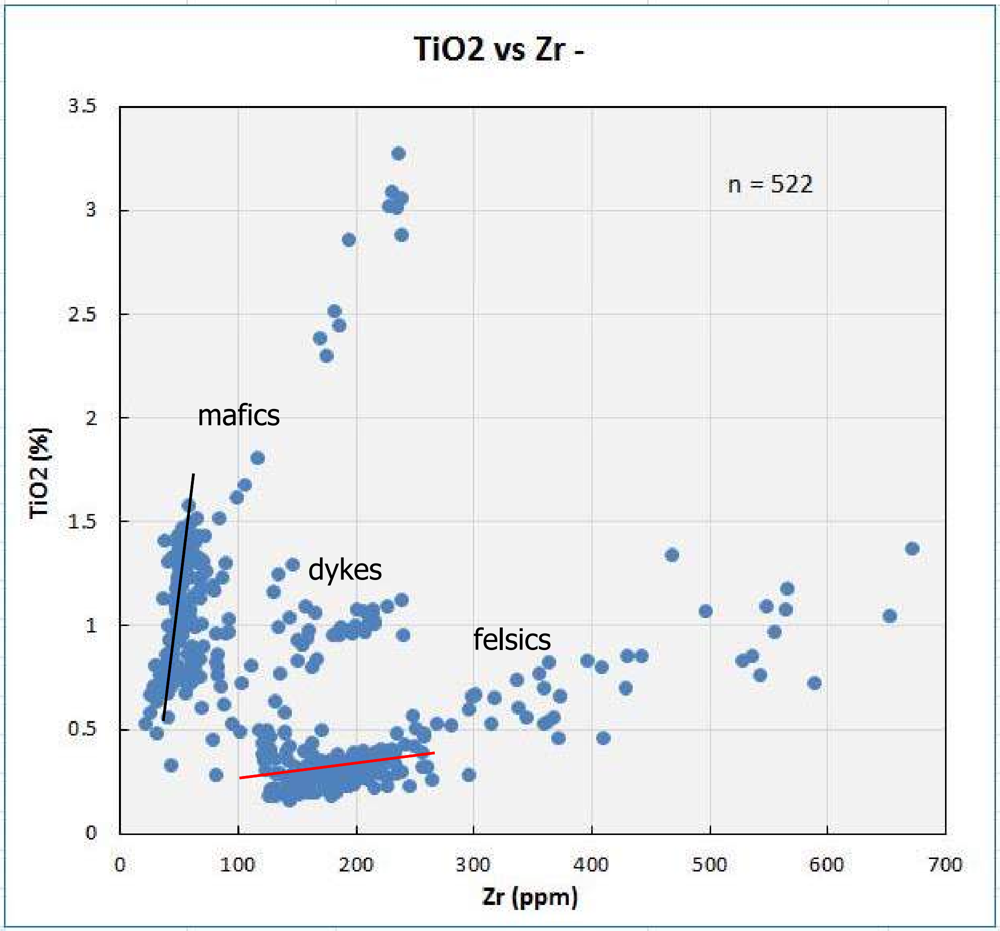
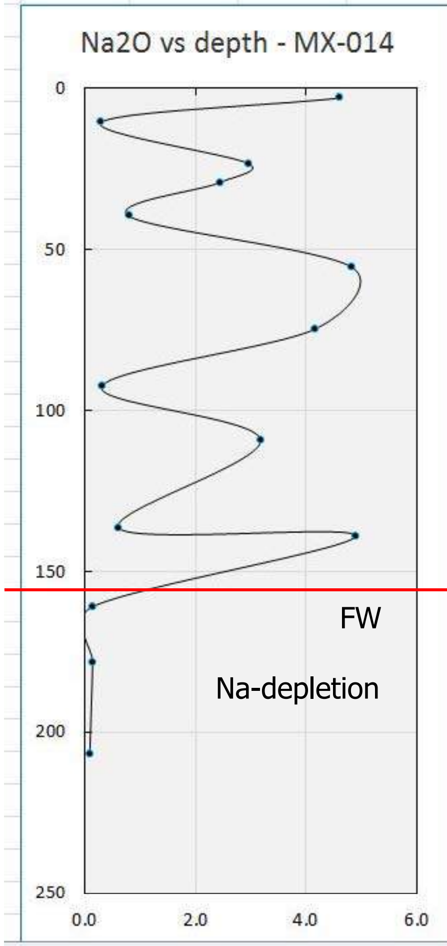
2014 EXPLORATION – LITHOGEOCHEMISTRY





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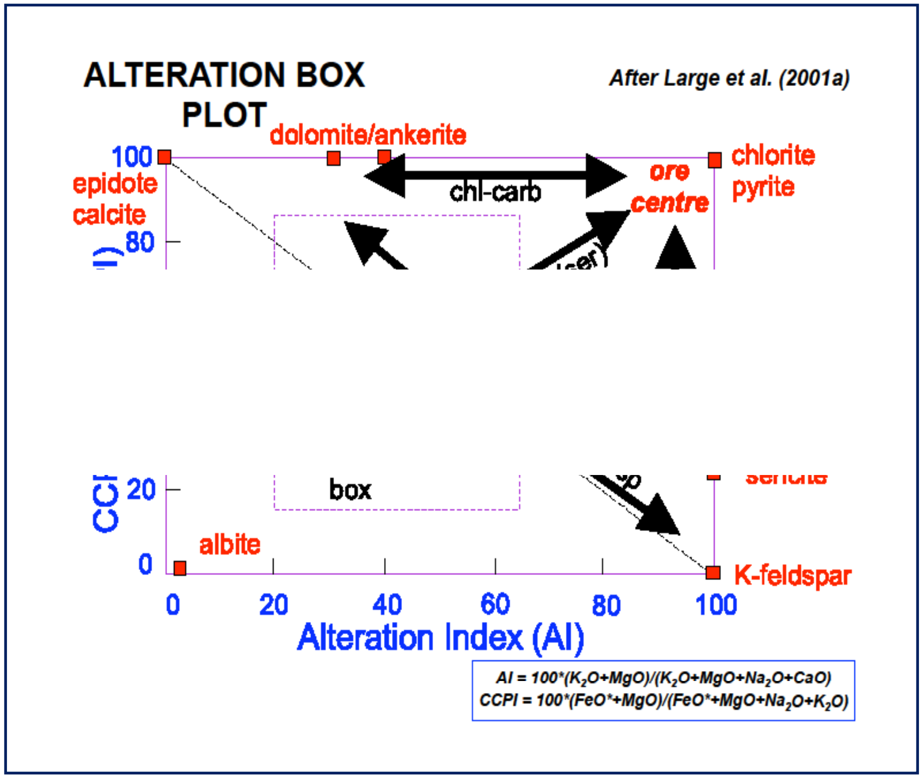
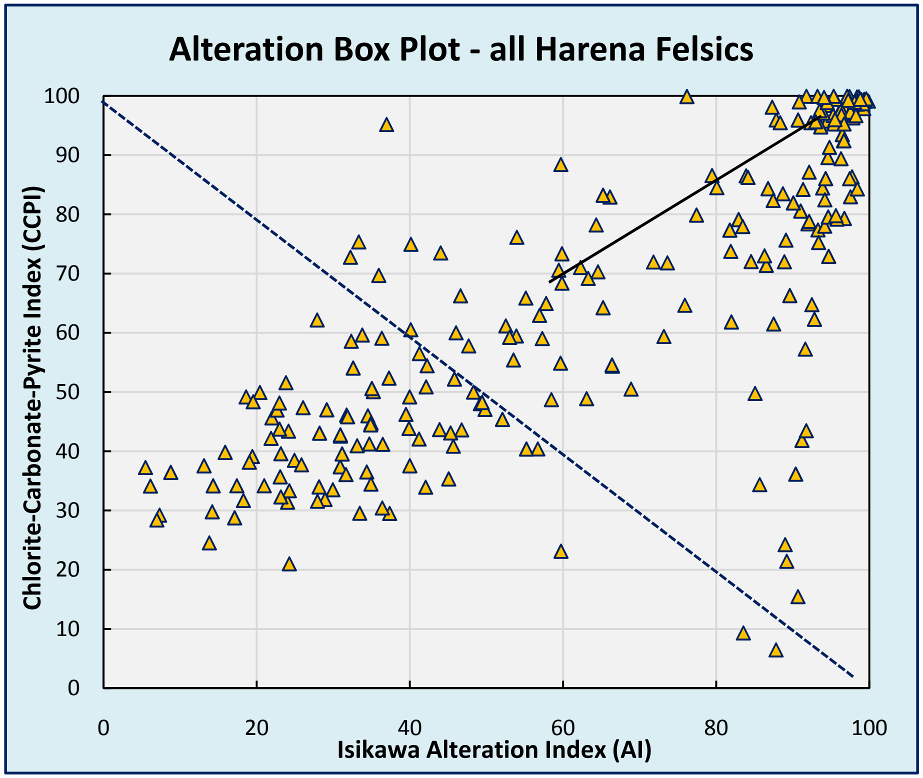
2014 EXPLORATION – LITHOGEOCHEMISTRY





Harena Felsics exhibit strong Chlorite-pyrite-(sericite) alteration

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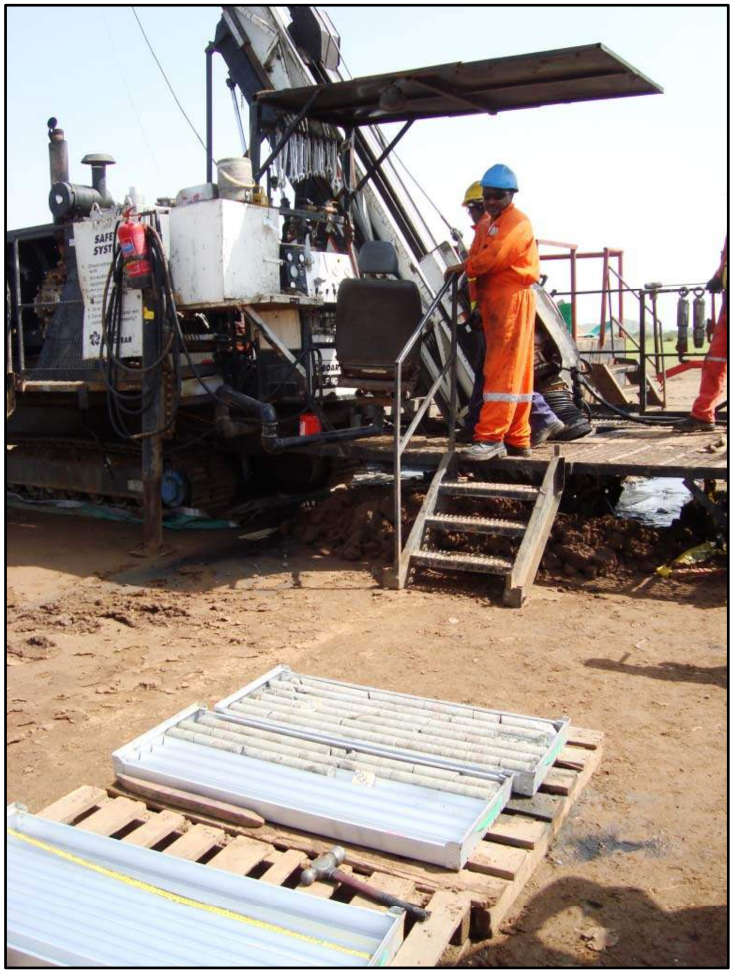
2014 EXPLORATION – DIAMOND DRILLING



Drilling massive sulphides at Harena (July 2014)

2014 Drilling

- 25,000m, > 100 holes
- Variety of targets at Bisha, Harena, Mogoraib River EL
- Variety of target types
- Work will continue into 2015

Drilling at Aderat (June 2014)

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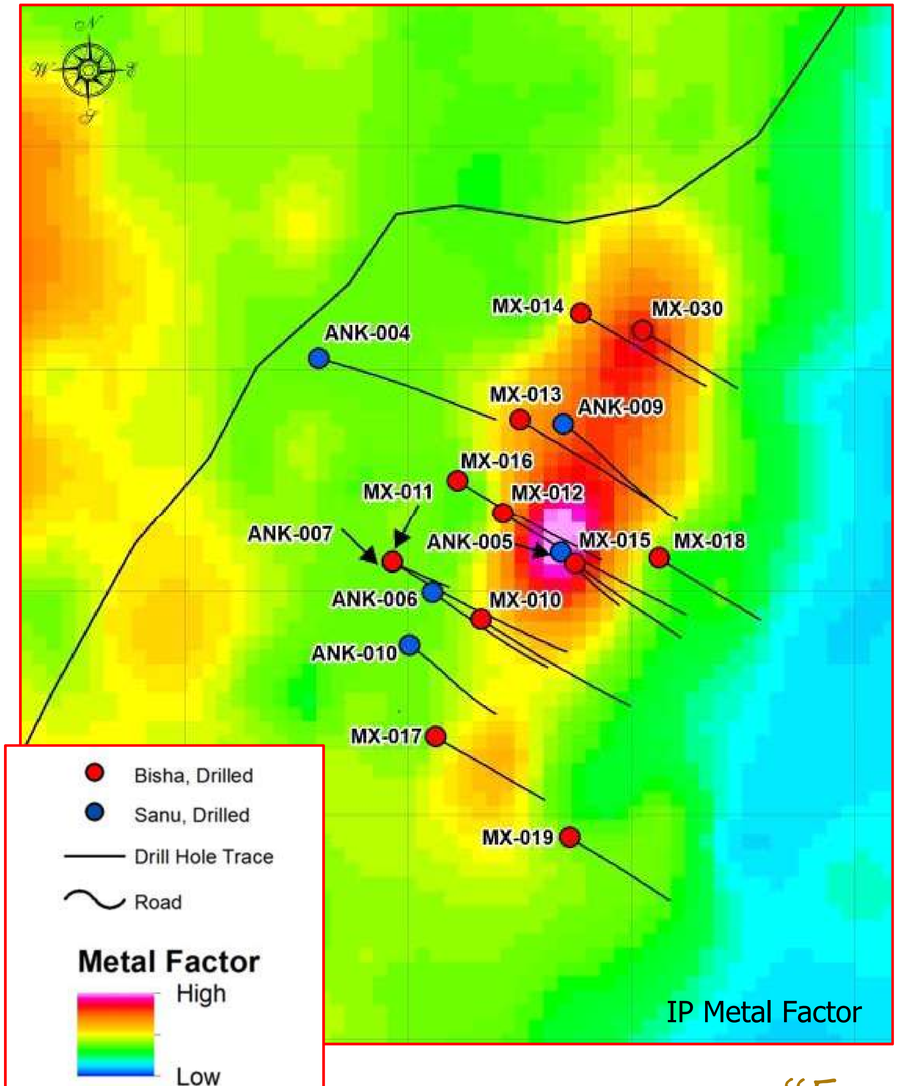
ADERAT – MOGORAIB RIVER EL



Aderat – Sanu Resources

- Located 4km N of the Hambok Deposit
- 2008-09 Discovered and Drilled by Sanu Resources
- DDH ANK-006 (Sanu, 2009) hit 27m intersection
- Grades up to 12.8% Zn, 2.6% Cu, 2.4% Au
- ~15% sulphide – High Metal Tenor system

Aderat – BMSC 2014

- Follow-up drilling to ANK-006
- Extended Zone up-dip, down-dip, along strike
- With similar results
- Will continue drilling after surface Geophysics

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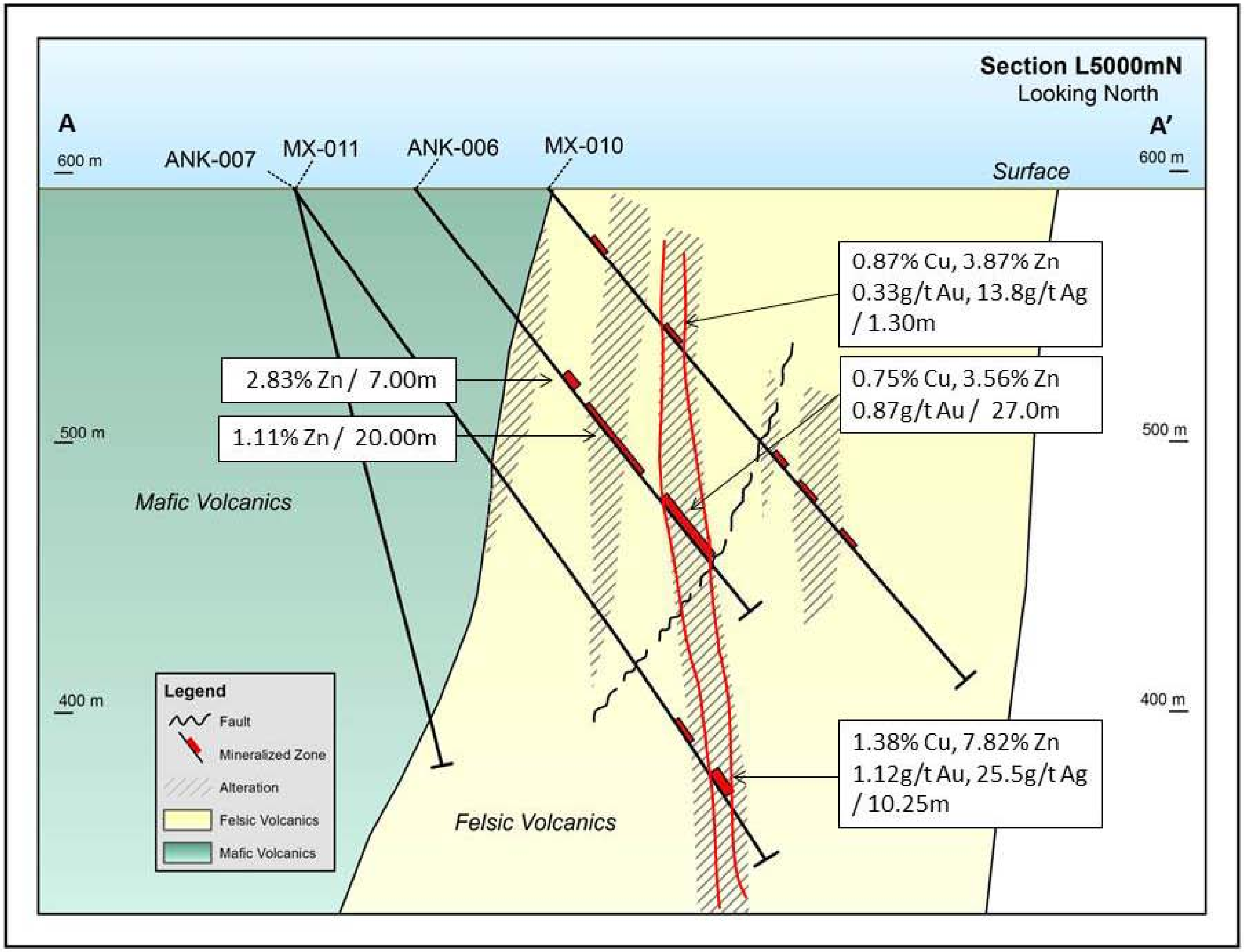
ADERAT SECTION L5000mN



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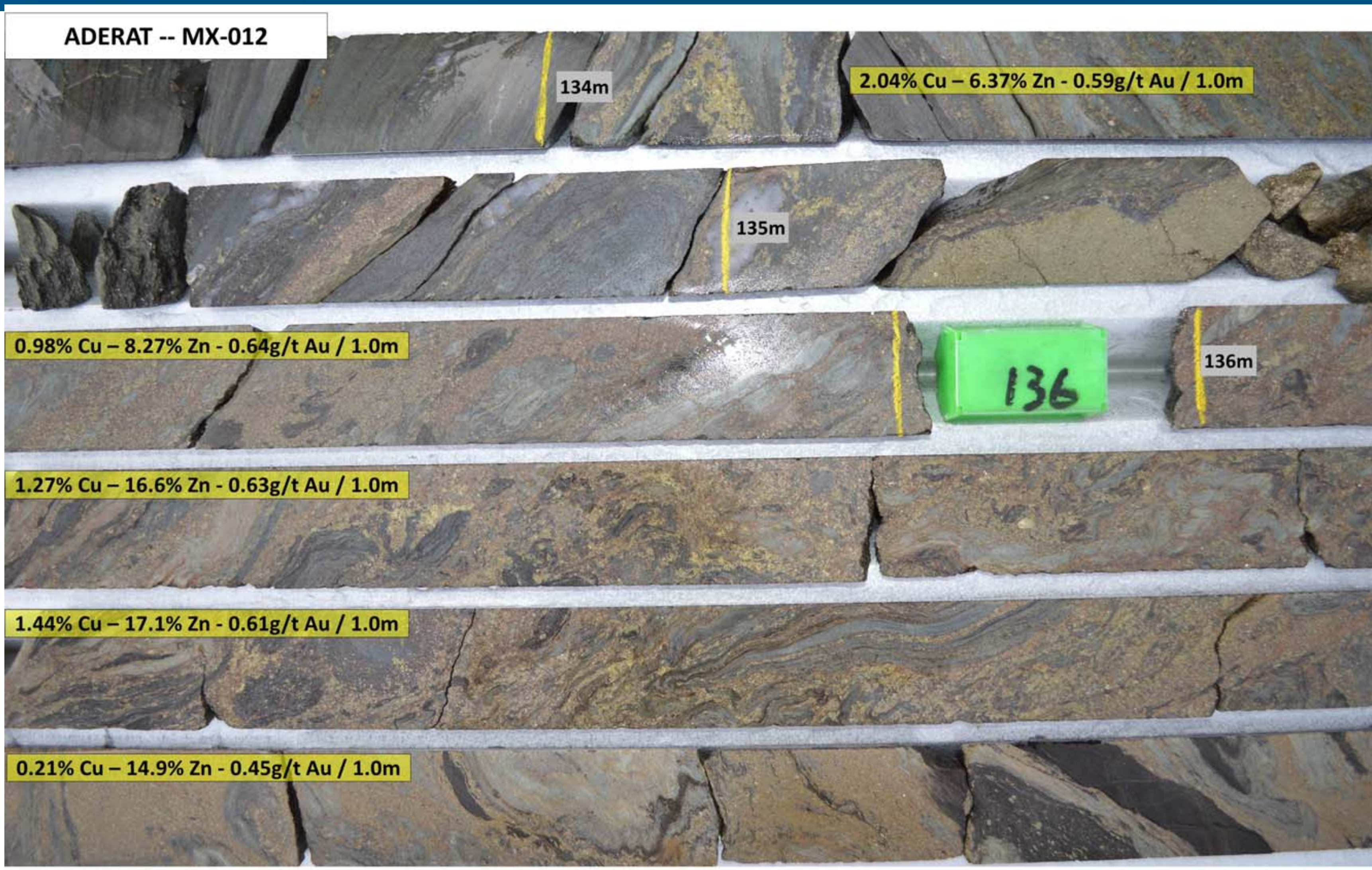
ADERAT– DDH MX 012



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HARENA – 2014 DRILLING

DDH Drilling at Harena (June 2014)

Harena – Previous Work

- located 10km from processing plant
- Previous drilling focused on defining the Oxide Gold Reserve
- 2011-12 – Mining Oxide Gold
- No Footwall drilling
- No Step-out drilling
- little Exploration drilling

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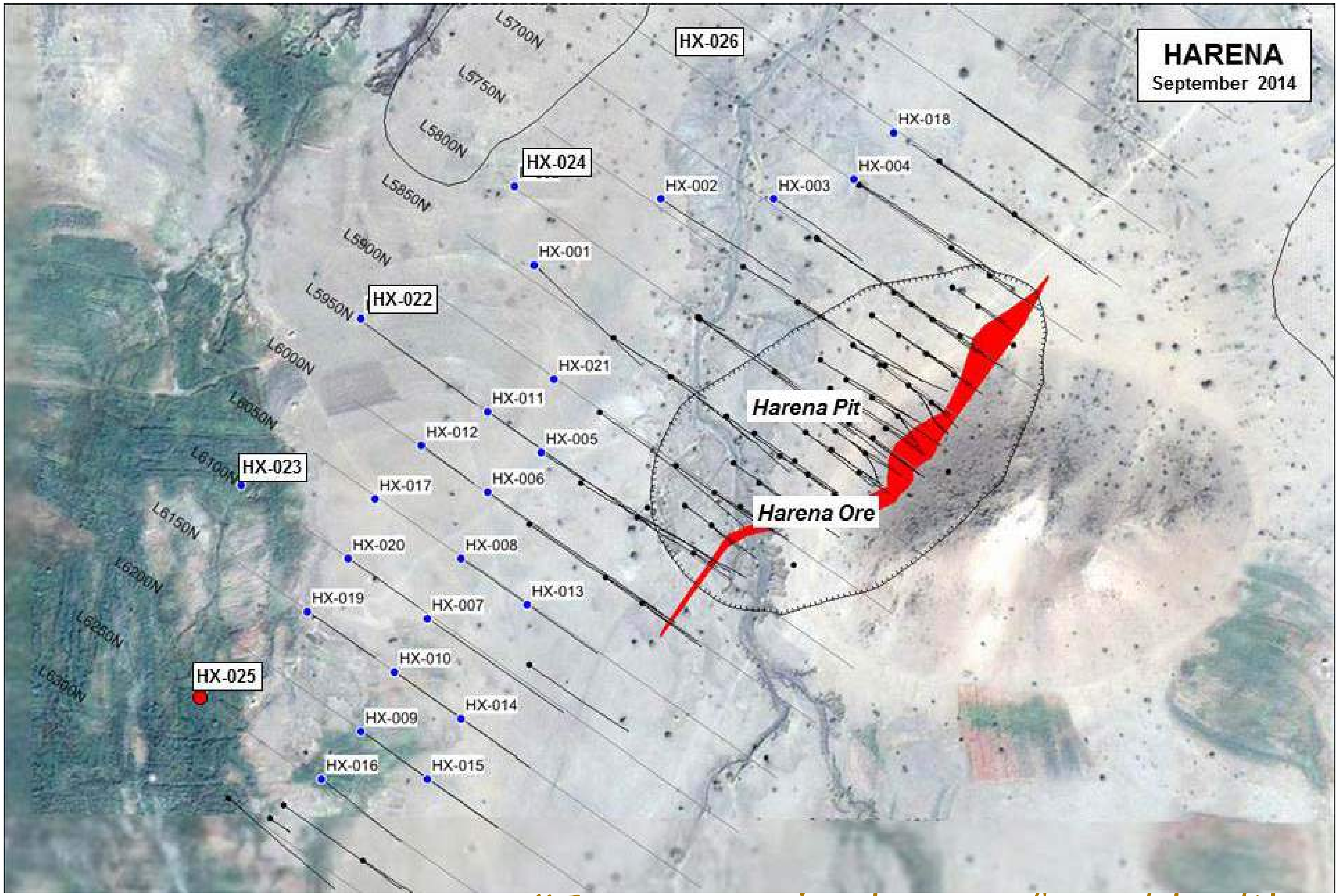
HARENA DRILL PLAN

Previous drilling focused on defining Oxide Au Reserve -- little Exploration drilling

Harena 2014 – Initial Targets: drilled under the Pit



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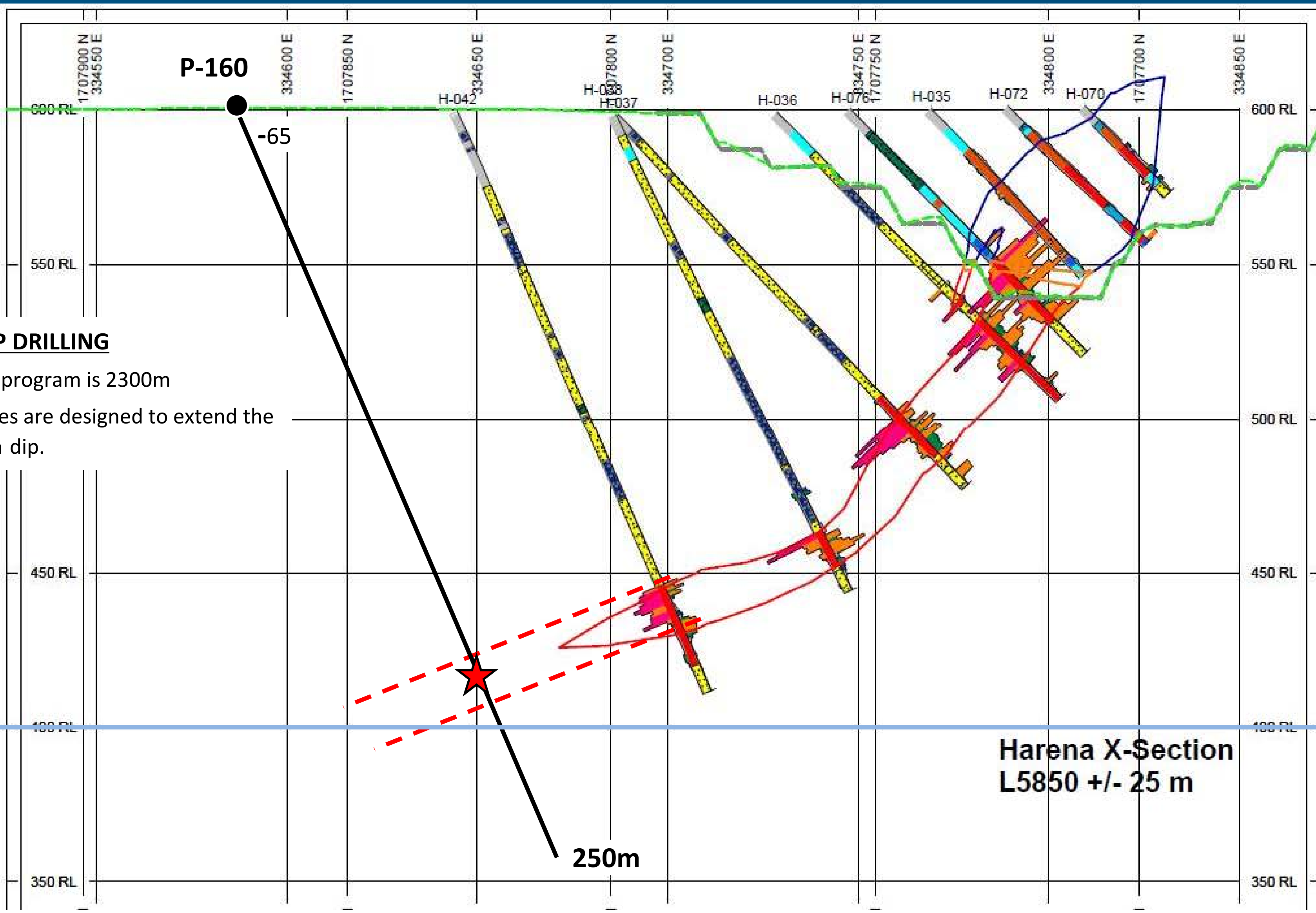
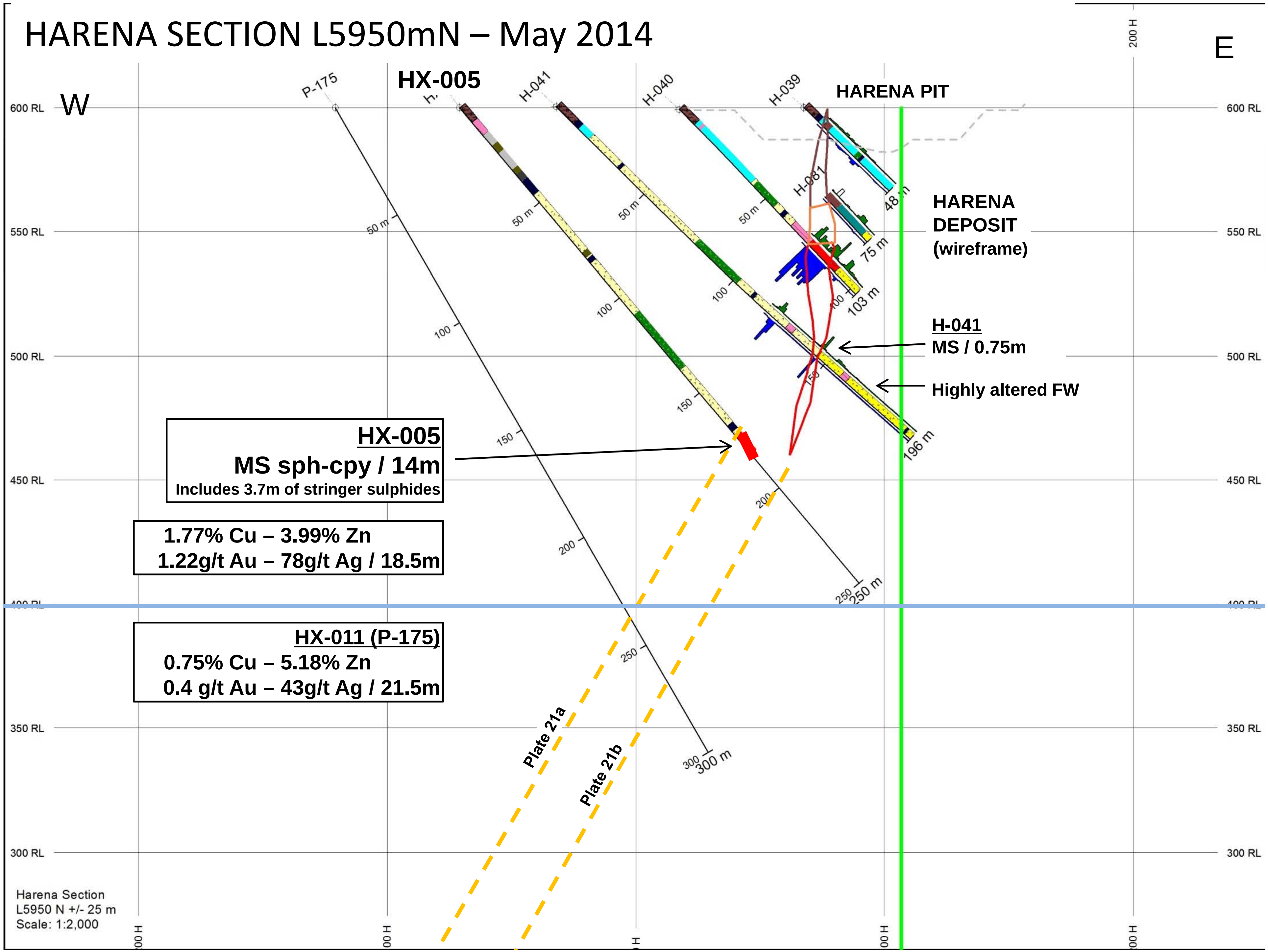
HARENA DRILLING – starts Monday April 28th



FOLLOW_UP DRILLING

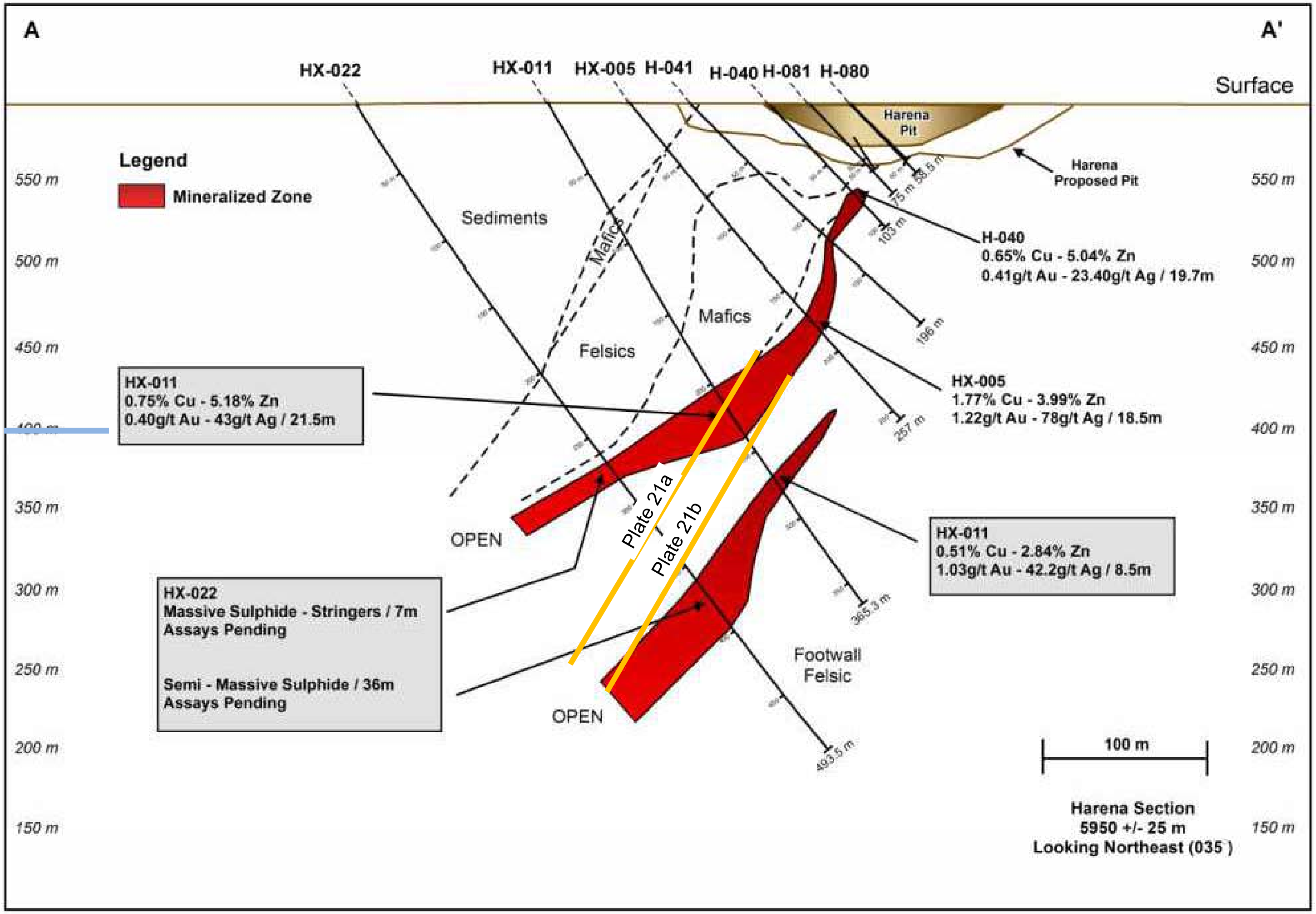
Harena 2014 program is 2300m

Initial 4 5 holes are designed to extend the deposit down dip.



HARENA SECTION L5950mN – May 2014
W
E
HX-005
P-175
H-041
H-040
H-039
H-081
HARENA PIT
HARENA
DEPOSIT
(wireframe)
H-041
MS / 0.75m
Highly altered FW
HX-005
MS sph-cpy / 14m
Includes 3.7m of stringer sulphides
1.77% Cu – 3.99% Zn
1.22g/t Au – 78g/t Ag / 18.5m
HX-011 (P-175)
0.75% Cu – 5.18% Zn
0.4 g/t Au – 43g/t Ag / 21.5m
Plate 21a
Plate 21b
600 RL
550 RL
500 RL
450 RL
350 RL
300 RL
48 m
75 m
103 m
196 m
250 m
300 m
Harena Section
L5950 N +/- 25 m
Scale: 1:2,000

HARENA SECTION L5950 – September 2014



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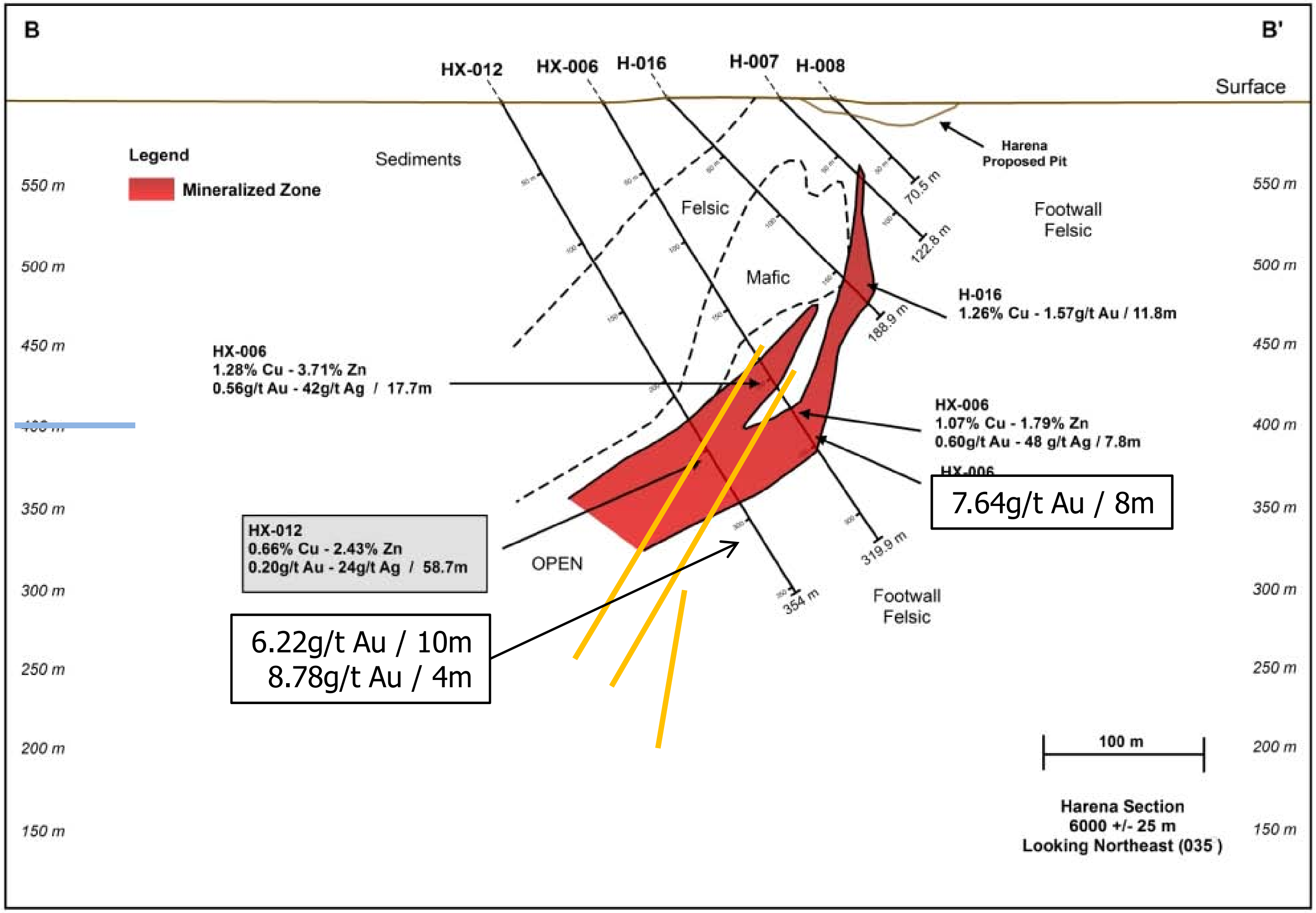
HARENA SECTION L6000 – Footwall Au Zone



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HAREAN 2014 – SELECTED RESULTS TO DATE

HOLE ID	From (m)	To (m)	Length (m)	Cu (%)	Zn (%)	Au (g/t)	Ag (g/t)
Massive Sulphide							
HX 004	170.00	180.45	10.45	2.30	0.91	1.30	42.9
HX 005	171.50	190.00	18.50	1.77	3.99	1.22	77.9
HX 006	189.10	206.80	17.70	1.28	3.71	0.56	41.7
HX 011	207.80	229.30	21.50	0.75	5.18	0.40	43.4
HX 012	275.50	289.00	13.50	0.96	6.57	0.30	30.1
HX 013	90.90	103.80	12.90	0.09	2.23	0.13	6.9
HX 017	235.40	277.00	41.60	0.85	3.96	0.40	43.6

Footwall Gold

HOLE ID	From (m)	To (m)	Length (m)	Cu (%)	Zn (%)	Au (g/t)	Ag (g/t)
HX 006	239.00	247.00	8.00	0.38	0.21	**7.64**	140.0
HX 008	187.00	204.15	17.15	0.71	0.22	**6.15**	241.6
HX 012	291.00	301.00	10.00	0.15	0.25	**6.22**	83.1
HX 012	316.00	320.00	4.00	0.01	0.01	**8.78**	93.8
HX 019	264.50	270.00	5.50	0.56	0.23	**8.04**	119.7
HX 020	258.00	272.00	14.00	0.25	0.11	**8.50**	146.2

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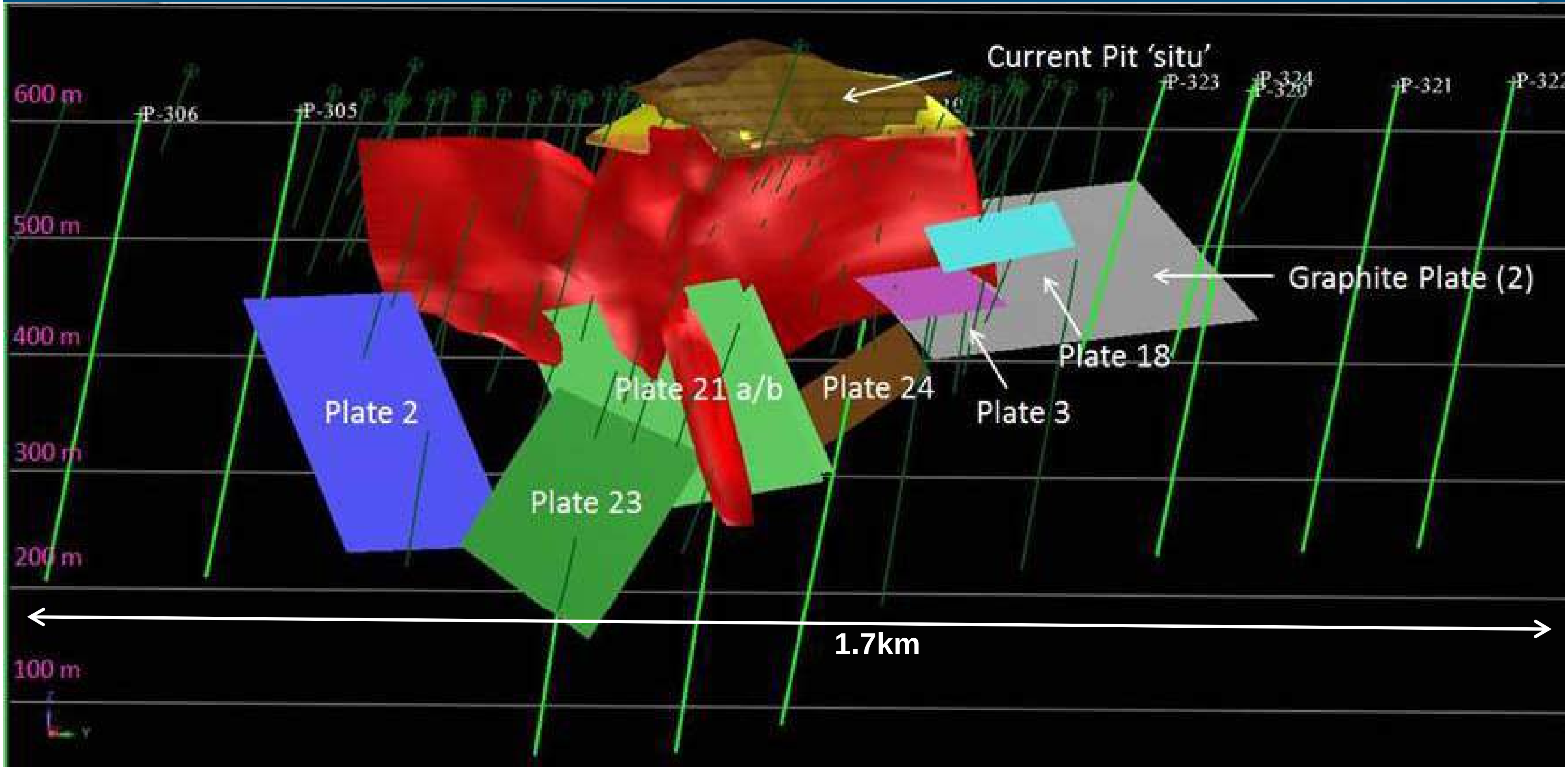
2014 EXPLORATION – MODEL



Harena Model – View from Footwall

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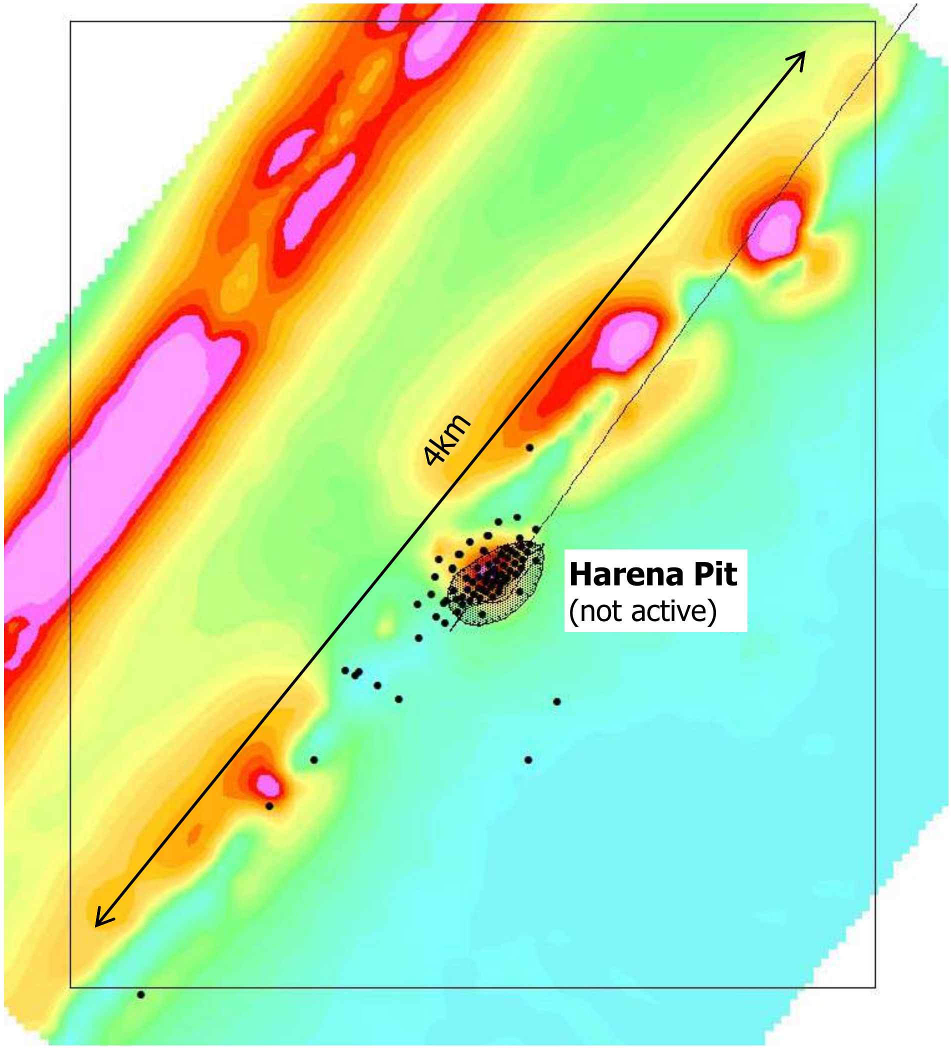
2014 EXPLORATION – AIRBORNE GEOPHYSICS



Harena Property

2014 AEM VTEM Survey

EM Ch 36 coloured

Showing previous drilling

"Everyone going home safe and healthy everyday"

Thank You!!

BISHA MINING

Mining
State & Investor
Striking a Balance

an idea to…

Advance investment in African Mining

Asmara Mining Conference 2014
1 – 5 October, 2014

Bruce Shapiro
President
MineAfrica Inc.
Canada-Southern Africa Chamber of Business

About MineAfrica

MineAfrica is a business development and marketing company providing the premier platform, since 2002, for mining companies, advisors to the mining industry, service providers and governments to promote themselves to a senior level, Africa focussed audience of financial institutions, investors, analysts, mining executives and media, all interested in Investing in African Mining via the following programs:

4th Focus on West Africa - London, UK - October 28, 2014

The Risk Mitigation & CSR Seminar Series - London, UK (October 31, 2014)
MineAfrica partners with the Canada-Southern Africa Chamber of Business and Founding Sponsor Hatch in delivering the leading CSR seminar series in Toronto, Vancouver and London, UK.

8th Annual Investing in African Mining - London, UK - December 1, 2014

5th Managing Your Risks in Investing in African Mining - Toronto, Canada - March 1, 2015

MineAfrica at PDAC - Toronto, Canada - March 1-4, 2015
Our 13th Annual Investing in African Mining Seminar in Toronto seminar takes place with the Canada-Southern Africa Chamber of Business 16th Annual African Mining Breakfast and is the biggest African mining event in North America.

MASTERMINING Educational Courses
MineAfrica organizes educational courses in various cities around the world under its MASTERMINING brand. We also design specialized courses in various areas depending on our client's requirements and our two ongoing offerings are:

- 3-day MASTERMINING course "Understanding the Mining Industry: From A to Z"
- A to Z of Mining Supply Chain Optimisation - Interactive one-day Workshop

Business Development, Marketing and Consulting Services
We provide effective advice based on our many years of experience in dealing with African mining opportunities

For full details of MineAfrica events and other services see http://www.mineafrica.com/

About the Canada-Southern Africa Chamber of Business

The Canada-Southern Africa Chamber of Business is the premier business association promoting trade and investment between Canada and Southern Africa (and beyond) primarily through organizing business networking events with speakers of interest to its members and guests.

Founded in 1994 after South Africa's democratic election, the Chamber originally focussed on South Africa. Given the broader geographic interests of its members across the African continent, the Chamber expanded its geographic focus in 2008. It is not-for-profit, apolitical and funded entirely by its membership and activities.

Chamber members and guest speakers represent the who’s who of Canadian companies invested in or doing business with Africa.

For full details of the Canada Southern Africa Chamber of Business, see www.canadasachamber.com

About this presentation

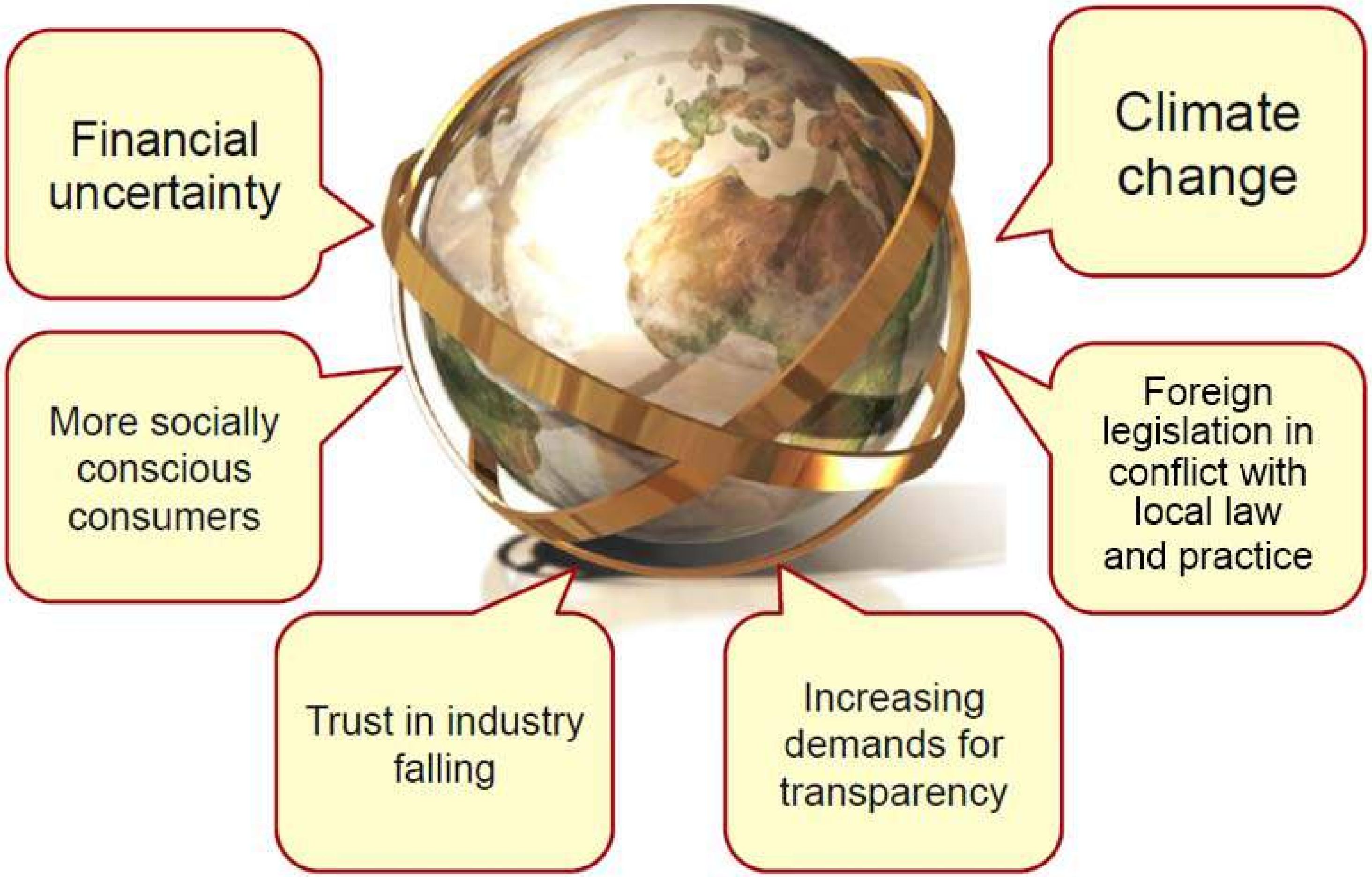
This presentation is based on my Opening Intervention on December 18, 2013 in Paris, France at the:

OECD Multi Stakeholder Consultation

First Policy Dialogue on Natural Resource Based Development

The original paper can be found at
http://www.oecd.org/dev/2.%20Kick%20off_taxation_Bruce%20Shapiro.pdf

Trends – Global level



www.icmm.com

Trends – country & local levels

Resource nationalism

\+ importance of mining in low and middle income countries

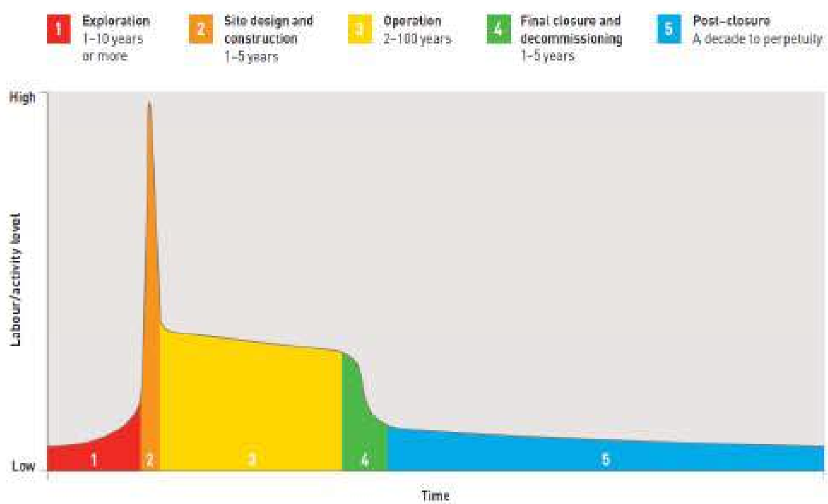
Limited understanding of benefits, costs and risks

Not all responsibilities and accountabilities addressed

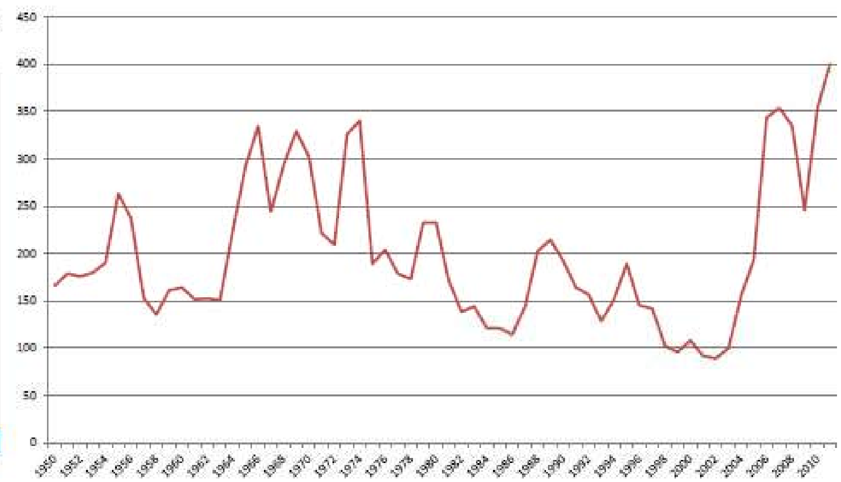
Increasing conflict

The time horizon disconnect

Mine project life cycle



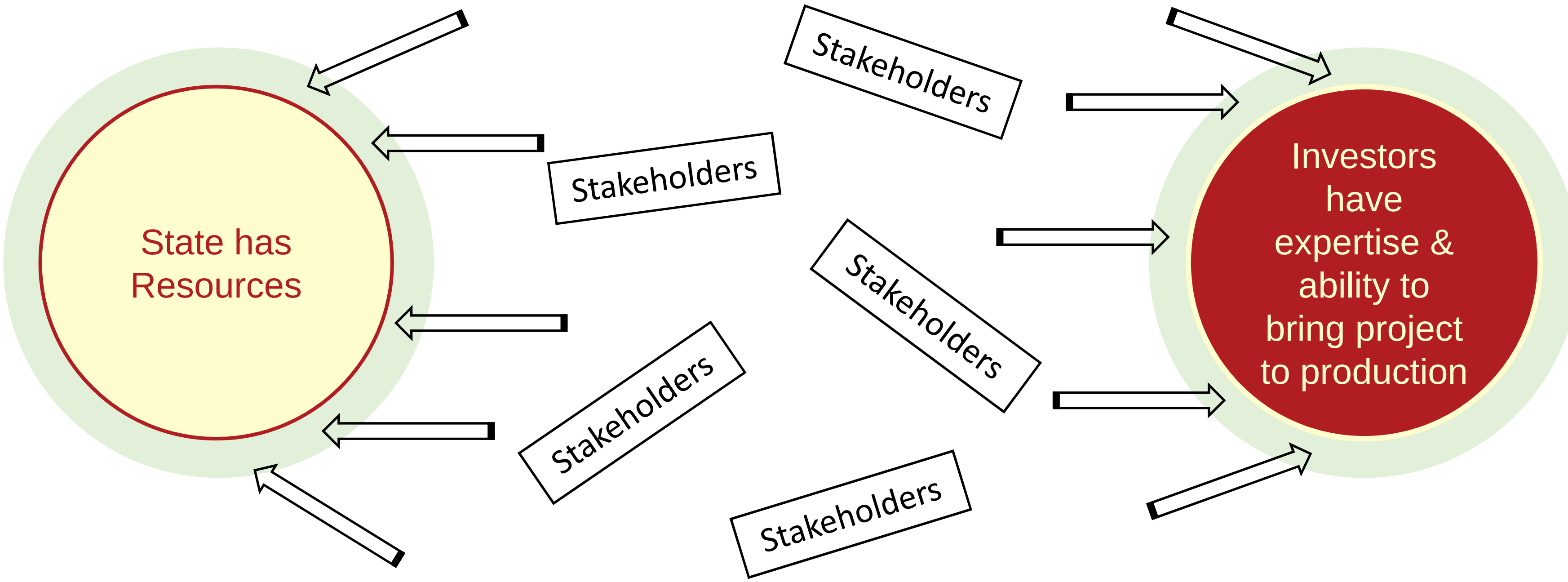
Copper price, 1950 – 2012, US cents (2012)/lb



Time horizon disconnect

- Mining investments, 30-100 year horizon
- Government, 3-5 year horizon
- Indigenous peoples, multi-generation
- Communities, often immediate
- Price, constant change

The main players



Broad range of stakeholders

State	Investor
Citizens	Shareholders
Host jurisdiction	Banks
Local Communities	Project Financiers
Investors – Attraction of Foreign Direct Investment (FDI)	Loan providers
	Host state
	Host jurisdiction
	Local communities
	Customers
	Any jurisdiction with "control"

The preferred result

Balance

⇕

A true partnership

The unfortunate truths in the investment decision process

- Money has no conscience
- Uncertainty is the enemy of investment

What is relevant?

- To the investor:

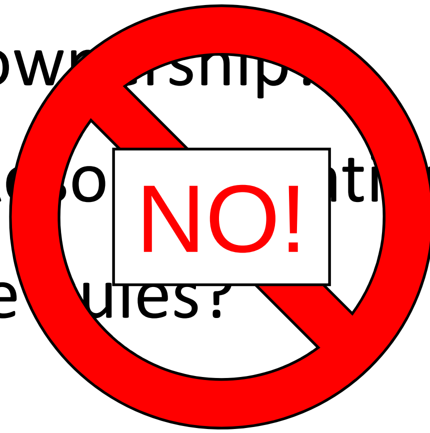
  Return on Investment (ROI)

- To the host jurisdiction:

  The total "Resource Rent", which includes all of the benefits of mining

What to do?

- Full State ownership?
- Creeping Resource Nationalization?
- Change the rules?



The answer

Host nations should allow investors an ROI which is adequate for them to be able to fund and operate the project.

This agreed ROI should be a minimum over the life of the investment.

The guarantee will likely result in an investor taking a lower ROI than in other circumstances.

…

However

Both the State and investors must benefit from any upside.

Given a guaranteed ROI, the investor would be satisfied with a smaller share of this upside, thus allowing the host jurisdiction a higher share of the upside.

How can this be done?

- Initial ROI to the investor is agreed and guaranteed.
- Split above agreed ROI between state and investor to be negotiated.
- Split below agreed ROI between state and investor to be negotiated. The state must still receive a minimum revenue stream.
- All calculations must be done at arms length by appropriate professionals, based on input costs including depreciation of assets and all output revenues.

When times are bad

- The State needs ongoing revenue and this can be provided on an agreed but realistic basis.
- The investor would not receive the agreed ROI, so when returns are again above the agreed threshold, the investor would receive a greater proportion of the upside than originally agreed until the guaranteed ROI has been achieved.

Main stakeholders in revenue & expenditure

The State, the investor and their respective stakeholders have an interest in, but not limited to, the following:

- Profit taxes (including profit, income and production taxes);
- Royalty payments (including royalty payments made in-kind);
- Fees (including license fees, rental fees and concession fees);
- Production entitlements (by both value and volume);
- Bonuses (including signature, discovery and production bonuses);
- Dividends (e.g. withholding tax);
- Payments made for infrastructure improvements including; and
- Transportation and terminal operations fees.

Many of these complex negotiations would be eliminated by agreeing a ROI and subsequent split of upside and downside. However, all of the above should be transparent as suggested by various bodies interested in transparency.
See: <hold for link to BennettJones transparency thinyg>

Conclusion

The ROI Approach:

- Reduces complexity of negotiations
- Removes uncertainty
- Creates flexibility
- IS A TRUE PARTNERSHIP

Appendix

References

- This presentation: Mining - State & Investor, Striking a Balance
- Mining's Contribution to Sustainable Development
  Ben Peachey, Director, Communications - International Council on Mining and Metals
- Opening Intervention – Bruce Shapiro
  OECD Development Centre Multi-stakeholder Consultation Policy Dialogue on Natural Resource-based Development
- Is Africa's "great boom" sustainable? Growth, prices and the resources rent between 1970 and 2010
  Eunomix
- An overview of various proposed and existing transparency initiatives in the extractive industries
  Eden M. Oliver, partner, Bennett Jones LLP, Toronto, Canada

Resources

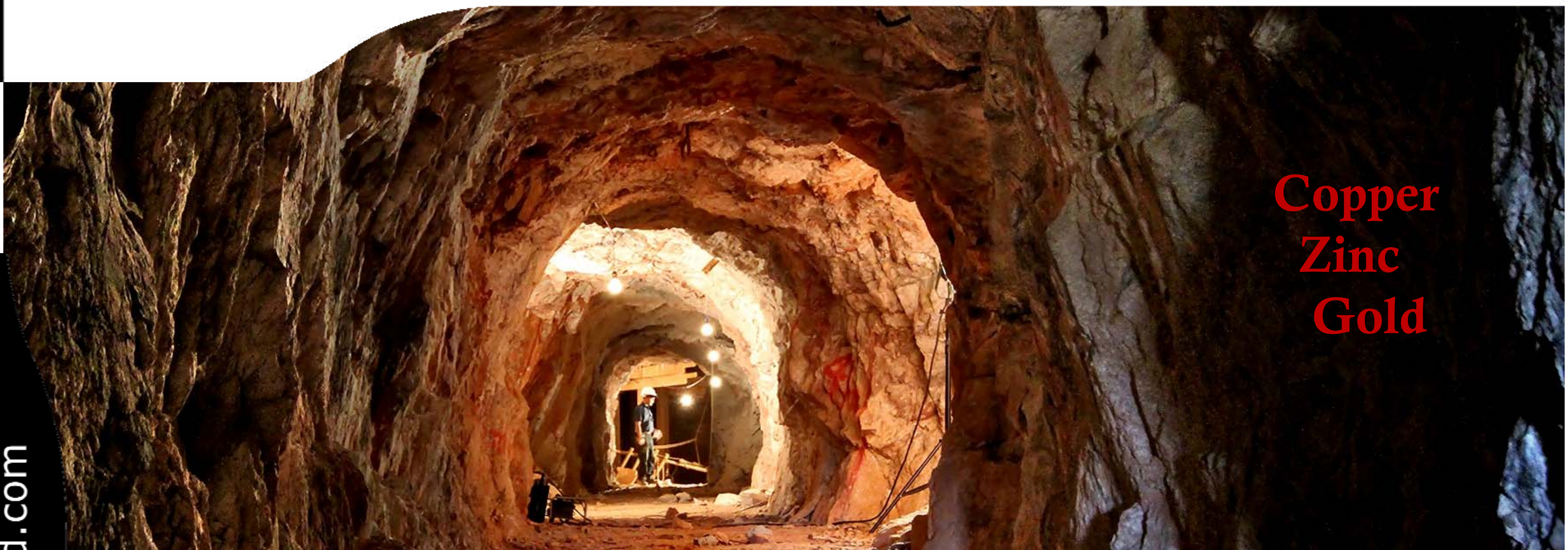
- MineAfrica
- Canada-Southern Africa Chamber of Business
- Prospectors and Developers Association of Canada
- International Council on Mining & Metals (ICMM)
- Eunomix
- OECD - Policy Dialogue on Natural Resource-based Development

Thank you

Bruce Shapiro
President
MineAfrica Inc.
Canada-Southern Africa Chamber of Business

SUNRIDGE GOLD CORP

October 2014



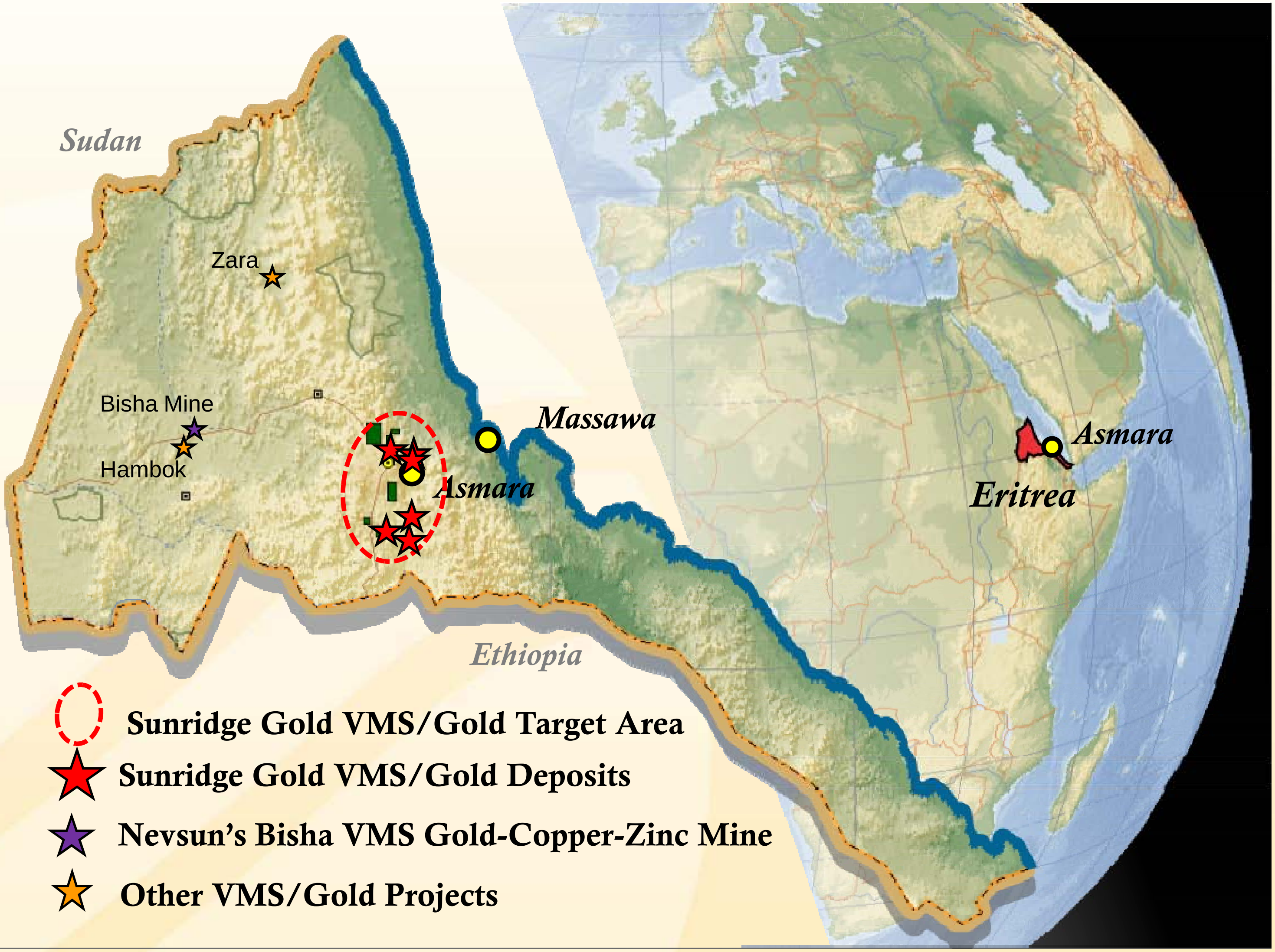
Underground workings at Debarwa copper-gold deposit

EXPLORATION, DEVELOPMENT AND BEYOND

SGC: TSX.V

www.sunridgegold.com

Eritrea and the Asmara Project



Asmara Licenses in 2003 (1100 Km²)
(SGC came in to Eritrea)

Adi Nefas

Medrizien

Debarwa

Advanced Projects

x Priority Targets

Granite

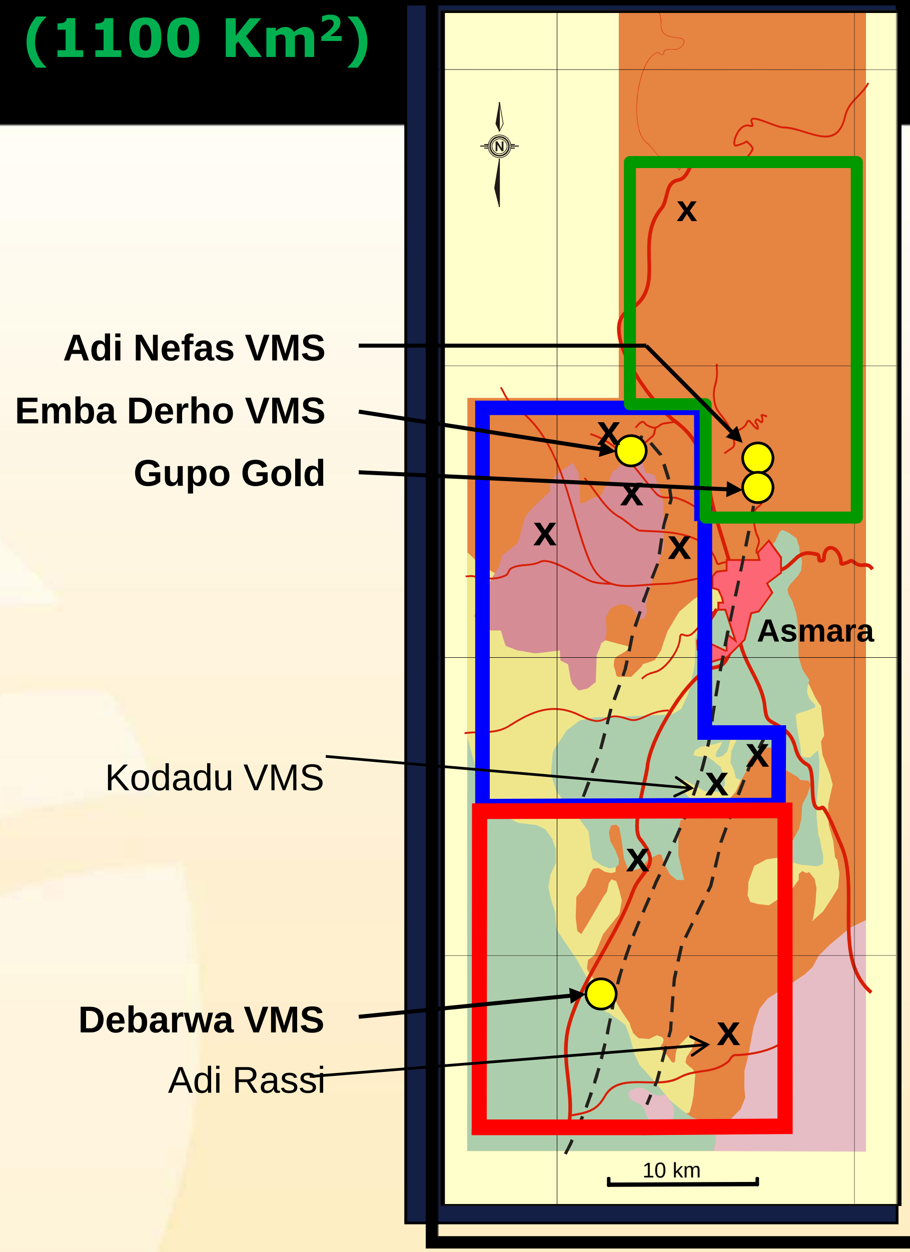
Quartz Porphyry

Tertiary Basalt

Laterite / Saprolite

Undifferentiated Proterozoic Rocks

VMS Structures



Debarwa EL - Exploration History Prior to 2003

DEBARWA EXPL. LICENSE

•**Western Mining Corp. (WMC) –** April 1996 to July 1997 (Debarwa & surroundings)

- *Mapping, geochem & geophy*. surveys

•Too small; Transferred to Phelps Dodge

•**Golden Star** : 1996 – 1998 (Adi Rassi & surroundings)

•*Mapping, Geochem, trenching, drilling*

•**Phelps Dodge**– July 1997 to Nov. 2001.

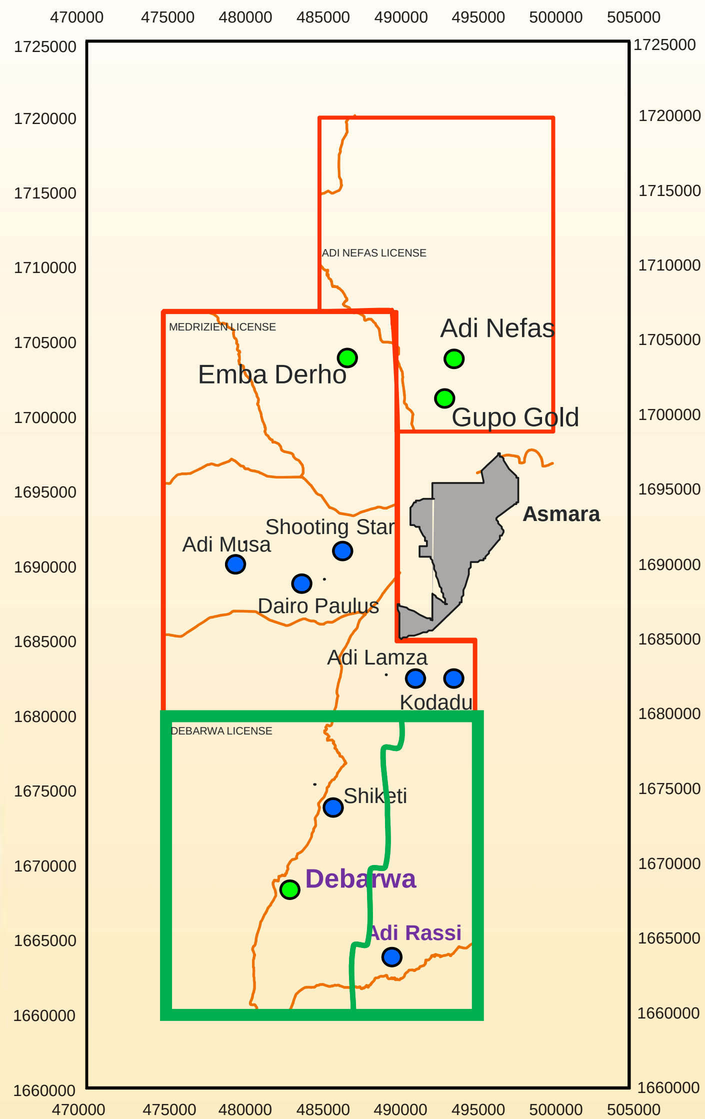
•*Re-mapped & drilled 12 holes*

- *PD concluded that Debarwa deposit is too small as a stand-alone mine & transferred Debarwa licenses to Sub-Sahara Resources in Nov. 2001*

- **SBS - Nov 2001 to Aug 2003 -** Regional mapping, drilled 9 holes at Debarwa

•***Aug 2003* - Sunridge and SBS *signed* JV *Agreement***

•*SGC drilled >46,000m & concluded/proved that Debarwa can be a stand along mine*



Medrizien license – Expl. History prior to 2003

MEDRIZEN EXPL. LICENSE

(includes the large Emba Derho deposit)

- **Ashanti Gold Fields**: March 1996 – March 1998
- *Mapping, geochem, geophysics, trenching & drilling (3 drill holes at ED)*

•**Phelps Dodge:** May 1998 to Nov. 2001

- *Remapped ED, trenching, geophysics,*

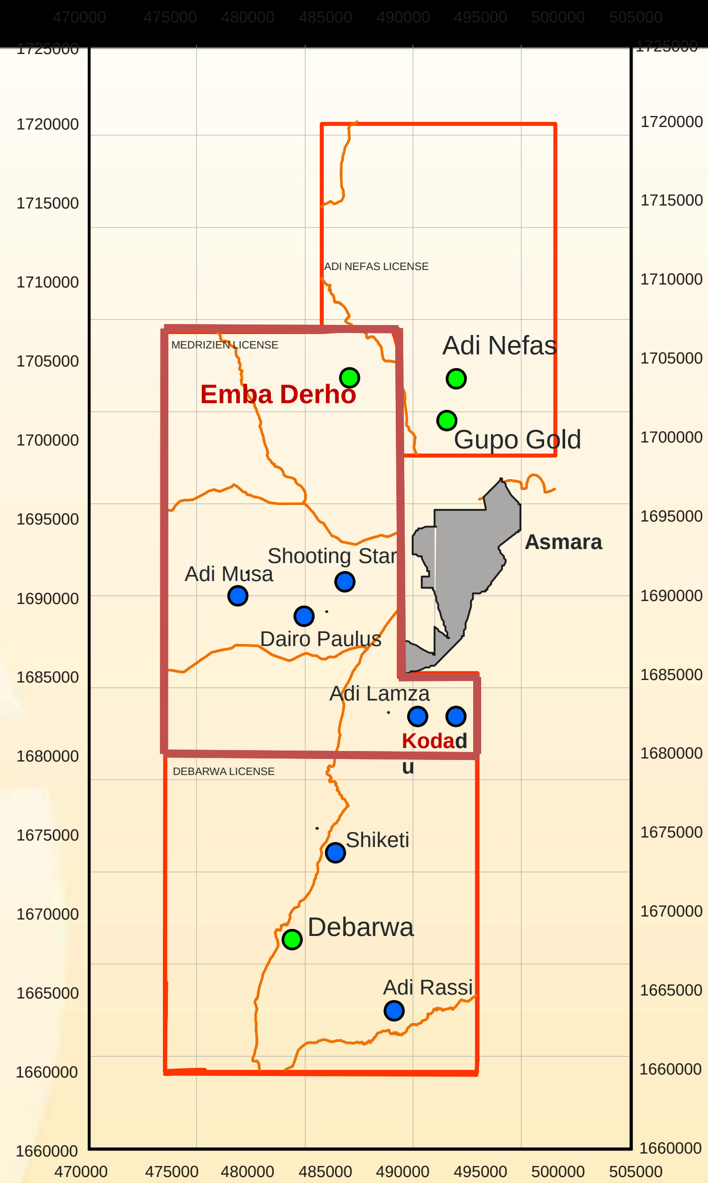
•drilled a single hole at ED to test TEM anomaly , intersected massive sulphide

•***Nov. 2001 -*** *PD pulled out & transferred Medrizien EL to* ***SBS****.*

SBS (Nov 2001 – Aug 2003) – Regional mapping, geochem, limited drilling

•**Sunridge and SBS signed JV Agreement – Aug 2003**

•**SGC** drill tested a gravity anomaly & discovered the large ED VMS deposit .



Emba Derho VMS Deposit

Sunridge/Sub-Sahara JV : Aug 2003 to Jan 2006

Airborne Mag/EM survey,
Surface geochem sampling,
Gravity survey
Drilling of 11 diamond holes

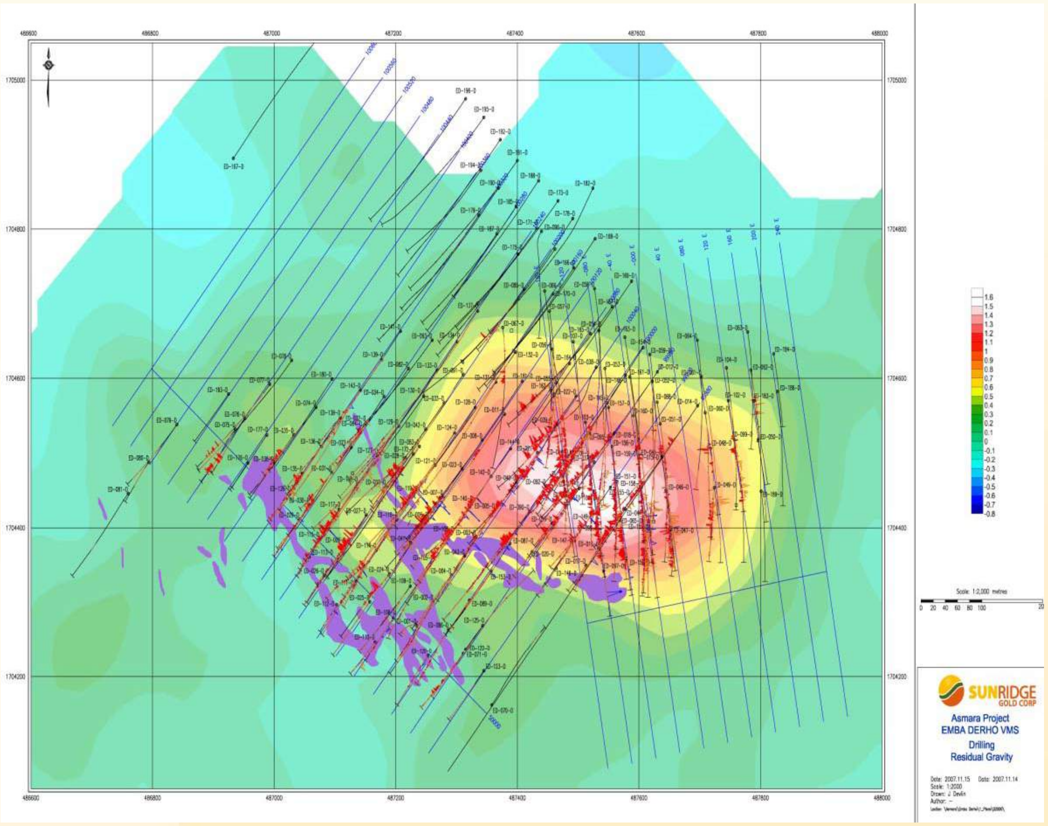
Sunridge Gold : Jan 2006 to present

Regional Gravity Survey (300x300m)
Detailed geological mapping
Ground geophysics (gravity, mag, pulse EM, down-hole EM, and AMT)

Feb 2006 - Discovery of the large ED blind deposit

Drilled 322 holes, totaling over 80,000m
Resource estimation – **70 million tones; huge world class deposit**
Completed FS in May 2013

Gravity high anomaly



Adi Nefas EL – Expl. History Prior to 2003

ADI NEFAS EXPL. LICENSE

(Includes Adi Nefas VMS & Gupo Gold)

•**La Source April 1996 – Mar. 1999**

•*Mapping, geochem, geophy., trenching, drilling at Gupo Gold*

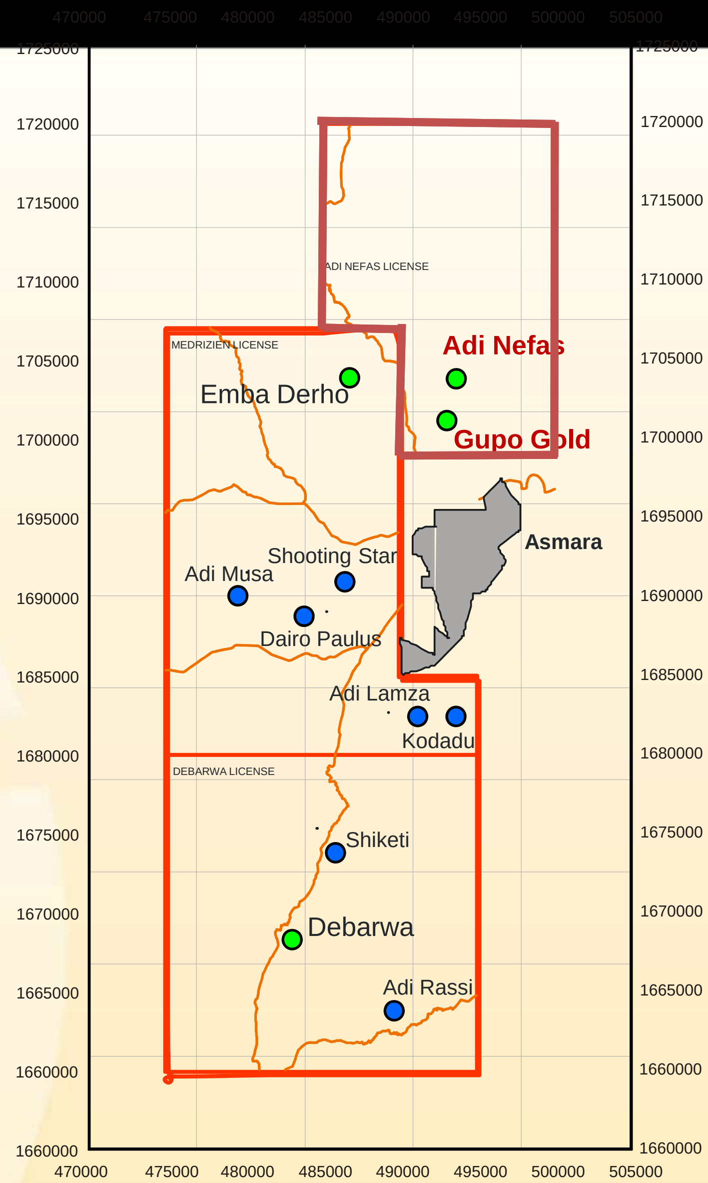
•*Focus on gold, concluded too small deposits and relinquished the license*

•**Sub-Sahara** acquired the Adi Nefas license in Nov. 2001.

•**Sunridge and SBS signed a JV Agreement in Aug 2003**

•*Sunridge drilled > 22,000m at Adi Nefas VMS and over 17,000m at Gupo*

•*SGC tested that the Adi Nefas VMS deposit is a high grade zinc deposit*



Asmara Project Agreement Terms

- ***Nov. 2001 – Aug. 2003*** **- Sub-Sahara Resources NL owns 100% of the 3 Asmara Exploration licenses;**
- ***August 2003*** **Sunridge & Sub-Sahara signed an agreement;**
- ***Jan. 2004 -*** **Sunridge earned 20% interest by funding $350,000**
- ***Feb. 2005 -*** **Sunridge earned 40% interest by funding $2.4 million & became operator**
- ***Jan. 2006 -*** **Sunridge exercised option to purchase SBS's 60%**
- ***April 2007 -*** **Sunridge owns 100% of Asmara Project by paying US$15.6 million in shares to Sub-Sahara**

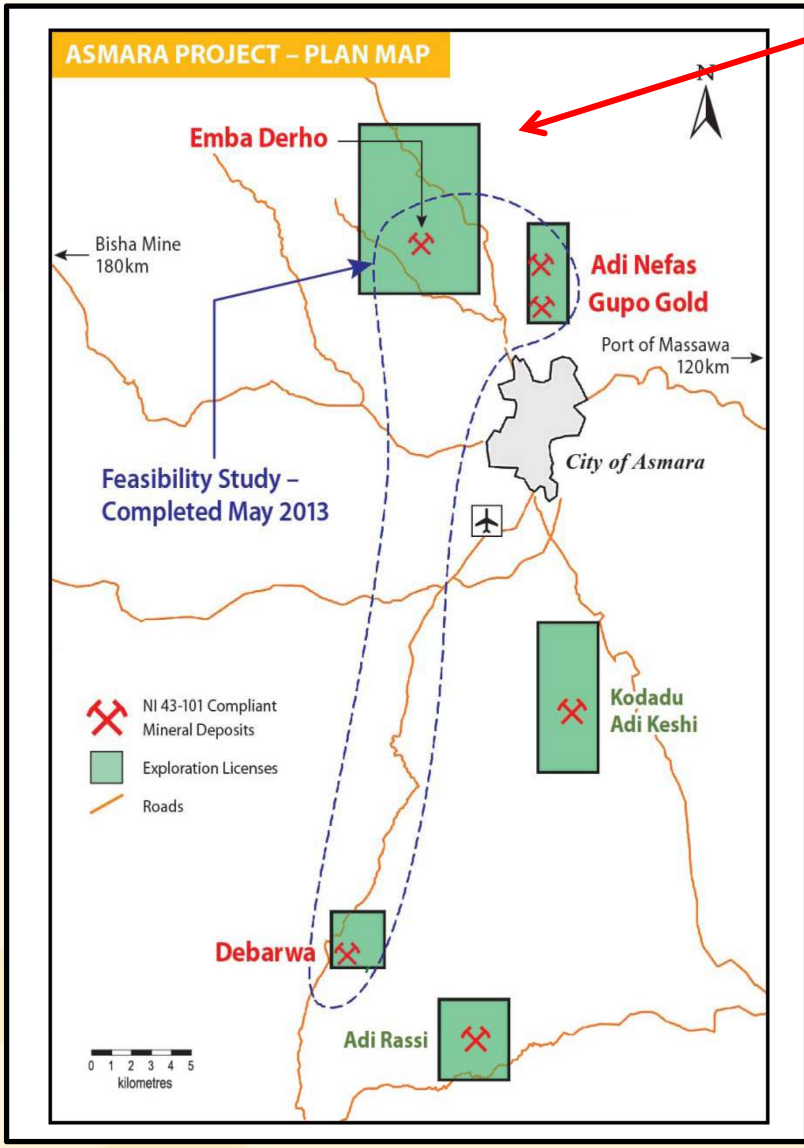
Summary of SGC Work on Asmara Project 2003 - 2014

- **Airborne Fugro survey over whole property 5,441 line kms (by SBS & SGC JV)**
- **Regional & local gravity survey > 60,000 stations**
- **Ground magnetic survey: over 1,000 line kms**
- **Ground EM surveys – over 170 line kms**
- **IP/Resistivity surveys: > 42 line kms**
- **AMT surveys: > 100 line kms**
- **Detailed geological mapping: >70 km**
- **Soil and rock geochemical surveys: +10,000 samples**
- **Trenching and channel sampling - +3800m**
- **Over 1200 drill holes, +210,000 m on 4 deposits & 12 prospects**
- **Metallurgical test-work on 6 deposits – total of +4000Kg**
- **Social & Envir baseline data collection on 5 deposits for SEIA**
- **Total exploration costs + US$88 million**

Asmara Project – Historical Highlights

- **February 2006 – Emba Derho discovered**
- **January 2008 – New resources for Debarwa & Adi Nefas by MSA**
- **September 2008 – indicated resource for ED by Wardrop – 59M ton**
- **October 2010 – SENET chosen to complete Debarwa feasibility study**
- **February 2011– Snowden chosen to complete PFS for Asmara North**
- **February 2012 – New Snowden resource for ED – 70M tonnes**
- **April 2012 – New resources for all 4 deposits for FS by Snowden**
- **May 2012 – Asmara North PFS & Debarwa FS completed**
- **June 2012 – SENET chosen to complete Asmara Project FS**
- **July 2012 – ENAMCO exercises option to acquire 30% interest**
- **May 2013 - Asmara Project FS completed**
- **2013/2014 – SEIA & SEMP submitted to the DoM**
- **June 2014 - Sunridge & ENAMCO signed shareholders' Agreement**
- **September 2014 – AMSC officially formed**

Asmara Project – Current Land Position (102km²) & Resources



Completed May 2013! **BFS - Central processing facility at Emba Derho with 3 satellite deposits:**

- **Emba Derho** - 70.0 million tonnes (Measured and Indicated) resource containing 1.0 Blbs Cu, 2.07 Blbs Zn, 506,000 oz Au, 19 M oz Ag
- **Adi Nefas** - 1.8 Mt (Indicated) resource at, 10.1% Zn, 3.3 g/t Au, 1.8%Cu & 115 g/t Ag
- **Gupo Gold** - 0.95 Mt (Indicated) resource at 1.52 g/t Au
- **Debarwa** - 3.3 Mt (Measured and Indicated) resource containing 200 Mlbs Cu, 74 Mlbs Zn, 180,000 oz Au, 2.94 M oz Ag

Development and Exploration:

- **Adi Rassi** –15.77 Mt (Inferred) resource at 0.54% copper and 0.33 g/t gold
- **Kodadu Gold Target** – (Inferred) resource of 990,000 tonnes with an average grade of 1.24 g/t gold & 1.6 g/t silver

Asmara Project – Contained Metals

Exploration Success on the Asmara Project – Contained Metal in Measured and Indicated Resources

Deposit	Copper millions of lbs	Zinc millions of lbs	Gold thousands oz	Silver million oz
Emba Derho	993.70	2,071.00	506.00	18.60
Debarwa	199.85	74.05	181.00	2.93
Adi Nefas	72.30	408.00	196.00	6.83
Gupo Gold	0	0	47.00	0
Totals	**1,265.85 (574,000 tonnes)**	**2,553.05 (1,158,000 tonnes)**	**930.00**	**28.36**

: Resources - Emba Derho Copper-Zinc-Gold Deposit

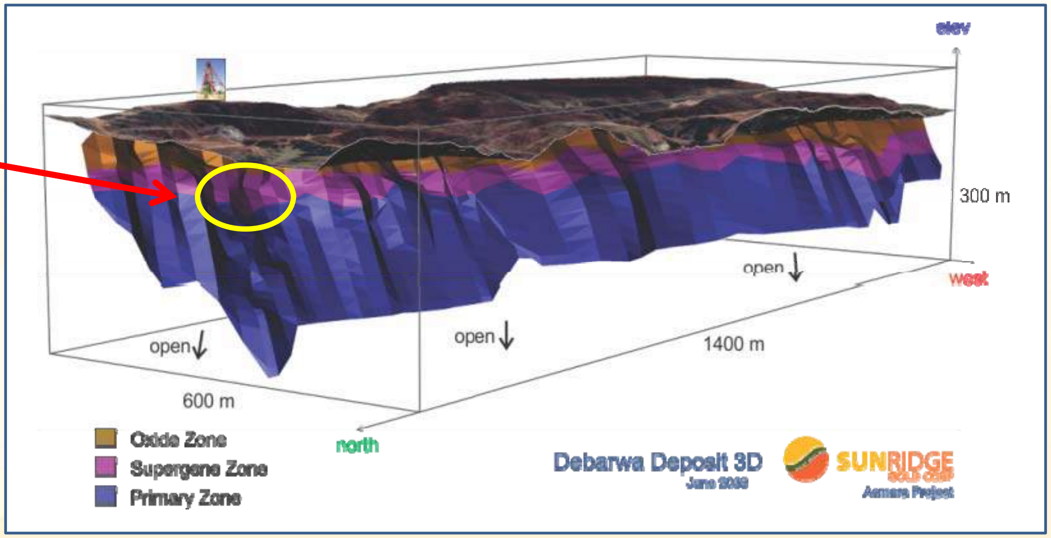
Emba Derho -Summary of Measured and Indicated Mineral Resource

Zone	Cut-off grade	tonnes (million)	Copper %	Zinc %	Gold g/t	Silver g/t
Gold Oxide	0.5 g/t Au	**1.74**	0.07	0.04	**1.06**	4.30
Cu Supergene	0.5% Cu	**1.64**	**0.94**	0.38	0.17	12.20
Copper-rich Primary	0.3% Cu	**49.80**	**0.83**	**0.93**	0.17	7.70
Zinc-rich Primary	<0.3% Cu, >1.0% Zn	**16.80**	0.14	**2.80**	0.31	9.90
TOTAL		**70.0**				

Sunridge Gold Corp: Mineral Resource Estimate Update, Emba Derho Deposit, Eritrea. NI 43-101 Technical Report prepared by Snowden Mining Industry Consultants Inc. for Sunridge Gold Inc. with contributions by Blue Coast Metallurgy Ltd. 110 pages. Effective date 6 February 2012.

Resources – Debarwa Copper-Zinc-Gold Deposit

Location of Direct Shipping Option (DSO) tonnage



Debarwa Measured and Indicated Resources*

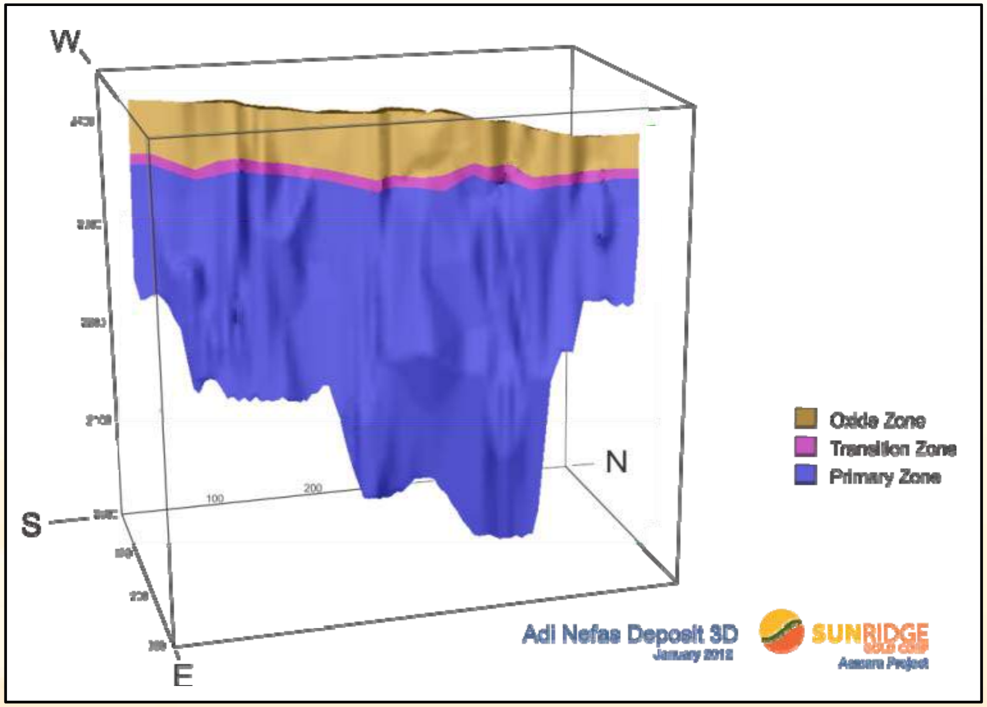
Material Type	Cut-off	Tonnes (million)	Copper (%)	Zinc (%)	Gold (g/t)	Silver (g/t)
Oxide	Au 0.5g/t	1.091	0.08	0.05	2.38	20
Supergene	Cu 0.5%	1.389	5.15	0.07	1.40	33
Primary	Cu 0.5%	0.832	2.20	3.86	1.50	29
Totals		3.312				
DSO zone	Cu 12.0%	**0.116**	**16.00**	**0.05**	**3.00**	**77**

* resource estimate completed by AMC Consultants (UK) Ltd, August 11, 2011

Resources – Adi Nefas Copper-Zinc-Gold Deposit

Adi Nefas:

- High grade zinc-copper-gold VMS deposit
- 6 km from Emba Derho
- High grade material to be blended with Emba Derho
- Underground mine plan



Measured and Indicated Resources*

Zone	Cut-off	tonnes (million)	Gold (g/t)	Silver (g/t)	Copper (%)	Zinc (%)
Primary	Zn 2 %	1.84	3.31	115	1.78	10.05

* Sunridge Gold Corp: Mineral Resource Estimate Update, Adi Nefas Property, Eritrea. NI 43-101 Technical Report prepared by Snowden Mining Industry Consultants Inc. for Sunridge Gold Inc. with contributions by Blue Coast Metallurgy Ltd. 82 pages. Effective date 20 February 2012.

Resources – Gupo Gold Deposit

Indicated resource*:

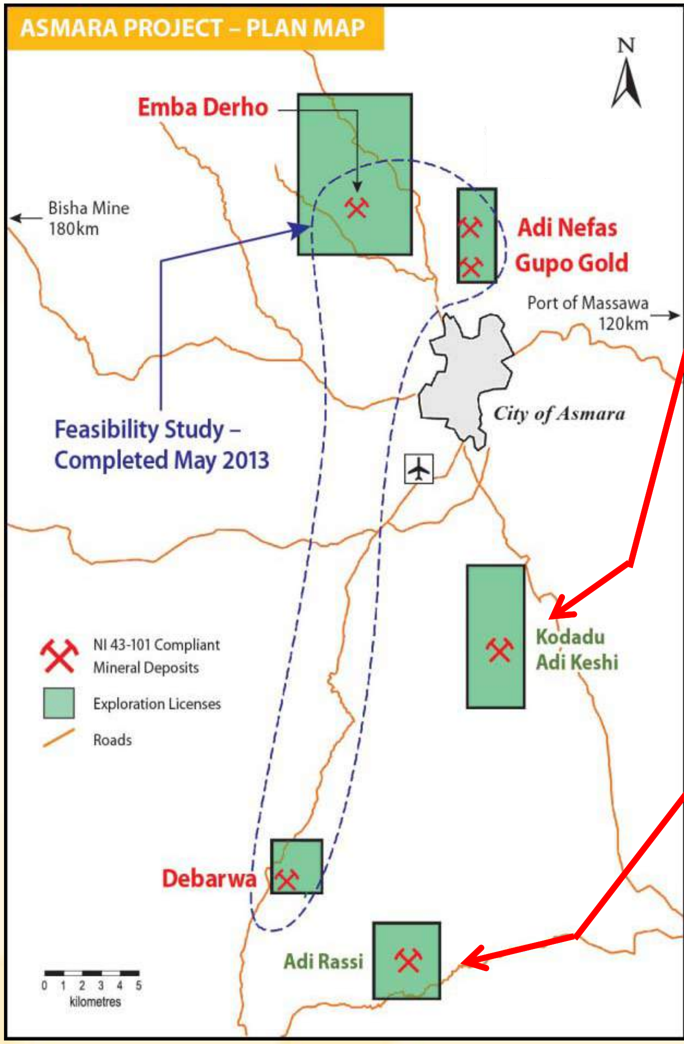
Cut of Grade g/t Au	Tonnes	Average Grade g/t Au	Ounces of Gold
0.5	951,800	1.53	46,780

Inferred resource*:

Cut of Grade g/t Au	Tonnes	Average Grade g/t Au	Ounces of Gold
0.5	1,808,550	1.83	106,340

* Sunridge Gold Corp: Gupo Gold Mineral Resource Estimate Update, Adi Nefas Property, Eritrea. NI 43-101 Technical Report prepared by Snowden Mining Industry Consultants Inc. for Sunridge Gold Corp. with contributions by Blue Coast Metallurgy Ltd. 97 pages. Effective date 3 April 2012

Pipeline Deposits and current land position (102km^2)



Kodadu Gold Target:

- Inferred Mineral Resource of 990,000 tonnes with an average grade of 1.24 g/t gold & 1.6 g/t silver
- Contained metal = 39,000 ounces of gold & 51,000 ounces of silver in the near surface oxide
- Initial metallurgical results show gold can be recovered by heap-leaching
- The resource area is open for expansion

Adi Rassi:

- Inferred resource of 15.8 million tonnes with an average grade of 0.54% copper and 0.33 g/t gold.
- The resource area is open for expansion in most directions

Sunridge Successes

Sunridge has been successful in its exploration programs in Eritrea in the past 10 years:

The mysteries for the successes are:

- **Followed the right Exploration Approaches**
- **Experienced and devoted staff**
- **Well organized and strong Management**
- **Team work**
- **Government support**

ENAMCO

Sunridge and the Eritrean National Mining Corporation ("ENAMCO") have now executed a **shareholders' agreement** to organize and operate the Asmara Mining Share Company ("AMSC") - **June 27, 2014**

Agreement Highlights:

- AMSC will be owned 60% by Sunridge and 40% by ENAMCO (30% purchased and participating and 10% free carried interest) and will have a board of directors of five, comprising three from Sunridge and two from ENAMCO.
- ENAMCO is paying Sunridge **$18.33 million** for their purchase of 30% of the project

  (US$2 million received by Sunridge immediately on signing the Shareholders' Agreement, US$3 million to be paid by November 2014, US$6 million to be paid upon on signing project Financing Agreement, US$4 million 6 months after signing the Financing Agreement, US$3.3 million 12 months after signing the Financing Agreement)
- In addition, ENAMCO to fund the next ~US$6 million to AMSC for their portion of retroactive contributions to the project.
- All future project development or exploration costs will be shared two-thirds Sunridge and one-third ENAMCO.

Sunridge Gold Highlights

- Track record of success - explored and defined 6 deposits on the Asmara Project in Eritrea
- Feasibility Study completed on the 4 advanced projects demonstrate very strong economics; NPV (10%) = $428 million, IRR = 27%
- Mining License expected Q1 2015
- Near term production - minimizing dilution: Robust mining plan with a 3 phase staged start-up with Phase 1A DSO production beginning in 2015 providing injection of cash into the project
- Full production to average 65 million lbs. (29,000 t) copper and 184 million lbs. (83,000 t) zinc, with 42,000 oz gold and 1 million oz silver per year
- Strong Management Team with extensive experience in Eritrea
- Project has government participation (ENAMCO)

Asmara Project Feasibility Study – Mining Phases

Initial Capital Required

Phase I - DSO and Gold Production (Year 1 – Year 5)

± $30m

Phase IA – DSO (Year 1 – Year 2)

- Mining of 116,000 tonnes of high-grade DSO with an average grade of 15.6% copper, 2.96 g/t gold, and 76.8 g/t silver from Debarwa

± $50m

Phase IB – Gold production – (Year 1 – Year 5)

- Mining and heap-leaching of the 3.0 million tonnes near-surface gold "caps" at Debarwa and Emba Derho followed by Gupo Gold

± $357m

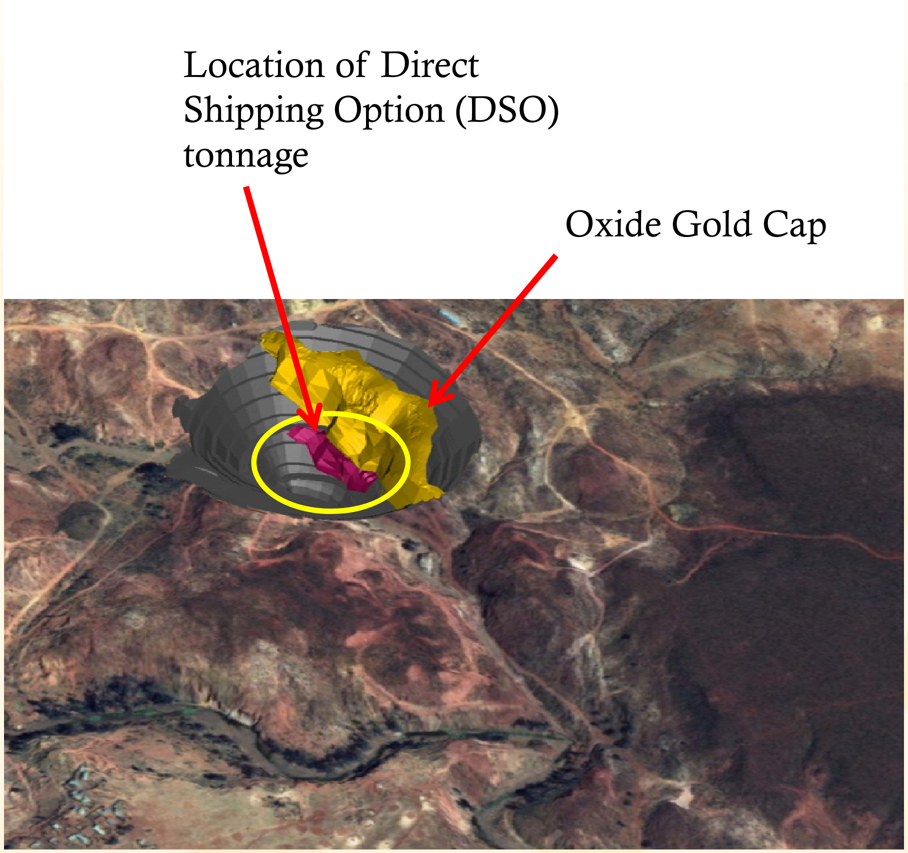
Phase II– Supergene Copper Production (Year 2 – Year 3.25)

- Mine and process by flotation 2.4 million tonnes of high-grade copper supergene ore from Debarwa and Emba Derho at rate of 2 million tonnes per year for 1.25 years
- Phase II average grades 2.25% copper, 0.76 g/t gold, 21.6 g/t silver

Phase III Full Production (Year 3.25 – Year 16.3)

- Mine and process by flotation 51.0 million tonnes of primary copper and zinc ore from Emba Derho, Debarwa, and Adi Nefas at a rate of 4 million tonnes per year for 13years

Phase 1A- DSO at Debarwa

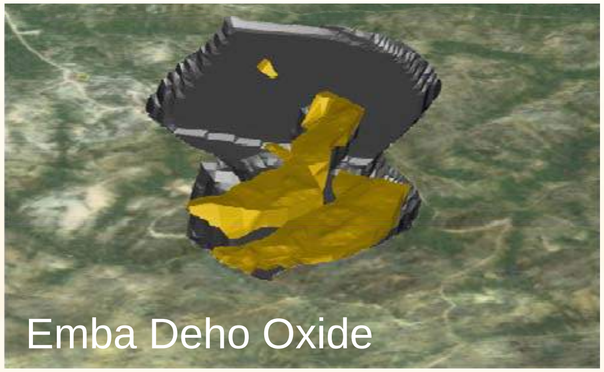


Phase IA – DSO (Year 1 – Year 2)

- Mining of 116,000 tonnes of high-grade DSO with an average grade of 15.6% copper, 2.96 g/t gold, and 76.8 g/t silver from Debarwa
- Crush and direct ship to smelter
- Mine and ship in 6 months
- Sandfire's Dagrussa Coper-Gold Mine had similar DSO start up

* resource estimate completed by AMC Consultants (UK) Ltd, August 11, 2011

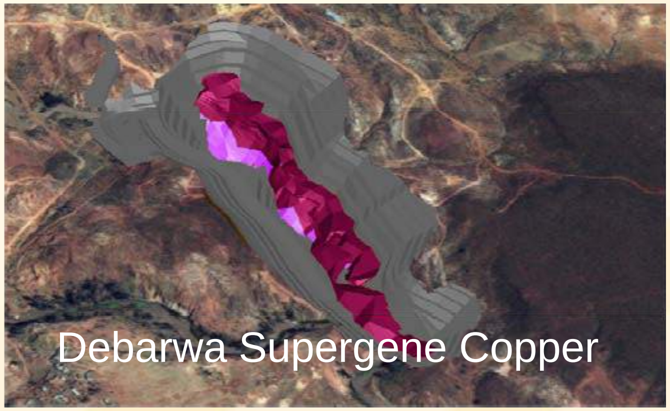
Phase 1B- Heap Leach Gold Production



Phase IB – Gold production – (Year 1 – Year 5)

- Mining of the 3.0 million tonnes near-surface gold "caps" at Debarwa and Emba Derho followed by Gupo Gold
- Process at gold heap-leaching operation near the Emba Derho deposit at a rate of 1.4 million tonnes per year
- Phase IB average grades 1.48 g/t gold and 8.2 g/t silver
- Phase IB average recoveries 66.7% gold, 37.7% silver
- Final Waste/Ore ratios at Gupo -1.7:1

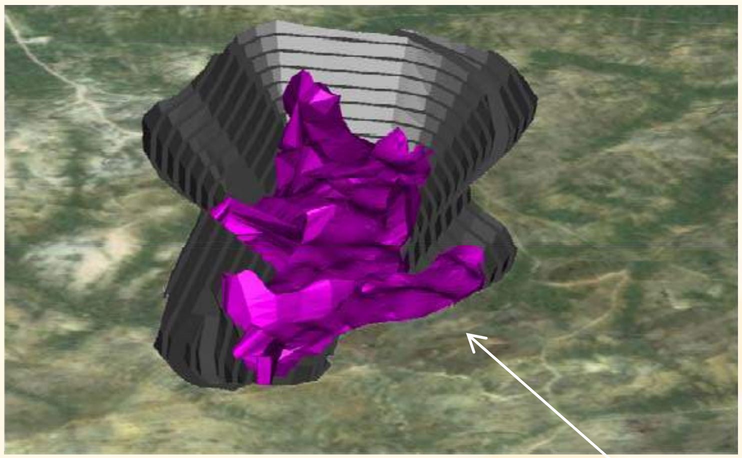
Phase 2- Supergene Copper Production



Phase II– Supergene Copper Production (Year 2 – Year 3.25)

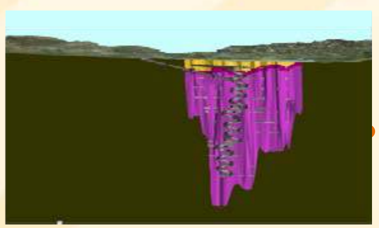
- Mine and process by flotation 2.4 million tonnes of high-grade copper supergene ore from Debarwa and Emba Derho at rate of 2 million tonnes per year for 1.25 years
- Phase II average grades 2.25% copper, 0.76 g/t gold, 21.6 g/t silver
- Phase II average recoveries 79% copper, 51% gold, 58% silver
- Copper concentrate – 25% copper, 4.2 g/t gold, 109 g/t silver

Phase 3- Full Production



Emba Derho Primary

Debarwa Primary



Adi Nefas Primary

Phase III Full Production (Year 3.25 – Year 16.3)

- Mine and process by flotation 51.0 million tonnes of primary copper and zinc ore from Emba Derho, Debarwa, and Adi Nefas at a rate of 4 million tonnes per year for 13years
- Phase III average grades 0.73% copper, 1.91% zinc, 0.36 g/t gold, 12.6 g/t silver
- Phase III recoveries average 86% copper, 86% zinc, 48% gold, 44% silver
- Copper concentrate – 25% copper, 7.9 g/t gold, 255 g/t silver
- Zinc concentrate – 57% zinc

Asmara Project – Potential Funding Sources

Export Credit Agencies

AMSC will carefully consider its procurement strategy and seek to maximise the use of funds and political risk covers available from this sector including approaching institutions such as EKN, other European ECAs, ECIC, EDC and KEXIM.

Equipment Financiers, Leasing Providers

Equipment providers such as Atlas Copco, Caterpillar may contribute to project finance funding particular if ECA cover is available

Development Banks and Multi-lateral Agencies

Development banks can provide potentially large amounts of financing and longer tenors and could also be considered for the Asmara Project. DEG and KfW were involved in the Bisha transaction and could again be approached.

Alternative Sources

Several funds and companies are now active in the mining sector who are looking to enter into royalty, streaming, offtake linked transactions and convertible notes

Offtakers

Offtake finance could come directly from smelting companies or traders.

Commercial Banks

Current market is characterised by no (or very weak) underwritings and certain banks withdrawing from the mining sector altogether which has reduced the overall lending capacity of the commercial bank sector.

Equity/Convertible Debt

In common with standard project finance practice a proportion of the funding requirement will come from the Sponsor's equity contribution which could be raised at the corporate level in the form of equity or quasi-equity such as convertible debt

Challenges to Financing the Current Plan

- **Quantum of Senior Debt**

  Requirement for US$300-350m of Senior Debt, US$50-80m of Cost Overrun Facility is a significant amount of debt to be raised in the current market irrespective of jurisdiction of the Project. Location of project reduces the number of financing sources currently available which provides a challenge to financing the current plan

- **Tenor of Senior Debt**

  Current modelling envisages a 3.5 year grace period for principal repayments followed by a 7 year repayment period so an overall tenor of 10.5 years. This will be challenging for commercial banks but may be possible for Development Financial Institutions and commercial banks under ECA cover

  A cash sweep of 50% is assumed which reduces the tenor from 10.5 years to 6.75 years which will provide some comfort to lenders

  Irrespective of ECA cover and the cashsweep the 3.5 year grace period required will be a concern to lenders

Alternative "phased" approach

Given the challenges highlighted it maybe prudent to consider a more stagger phased approach to development.

This will be worked on in parallel to the current financing plan and the current permitting process

This plan envisages a phased approach as set out below:

- **Phase IA – DSO only from Debarwa**

  Finance DSO only and use any excess cashflow after completion of DSO phase to provide funding to Phase IB

- **Phase IB – Gold Oxide HL**

  Finance gold HL and process oxide caps at Emba Derho, Debarwa and Gupo using excess cashflow from completion of Phase IA plus additional funding

  Use any excess cashflow after completion of oxide phase to provide funding to Phase II and Phase III

- **Phase II and III – Copper and Zinc (supergene and primary)**

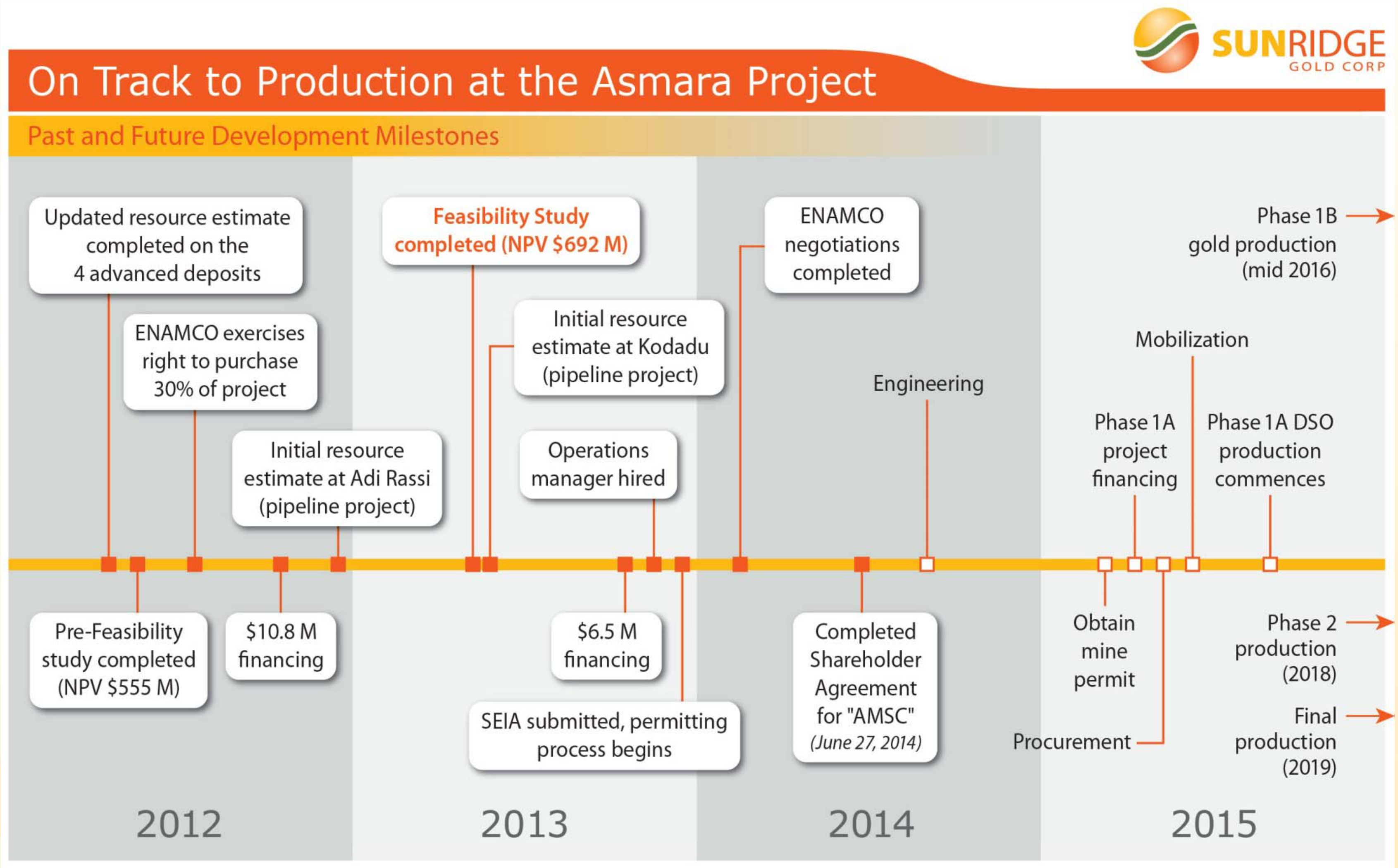
  Excess cashflow from Phase IA and IB provides equity portion of Phase II and Phase III project costs

  Remainder of project costs easier to fund from conventional debt markets now as grace period for repayments and overall tenor likely to be reduced. Plus company has demonstrated ability to build and operate to potential lenders

Alternative "phased" approach

- Financing for Phase IA and Phase IB unlikely to be financed from conventional lending sources but could potentially be financed from offtakers, equipment finance, streaming companies or alternative funds capable of providing mezzanine/bridge finance.
- Key to this approach is understanding capex, operating costs and cashflows from each phase on a stand-alone basis and to understand whether sufficient cash is generated by each stage to provide a meaningful contribution to the project costs for the next phase
- Additionally, the cashflows from Phase IA and Phase IB *ideally* need to also provide both payback and a return to any provider of funding for Phase IA and Phase IB
- If the cashflows generated in each phase are insufficient to payback the funding provider then will likely need an alternative structure that provides a return over a longer timeframe (i.e. over Life of Mine and including Phase II and III) such as a 3rd party royalty or streaming transaction
- Some initial optimization work to understand better the capex, operating costs and cashflows of this staged approach will be required

Asmara Project Timeline



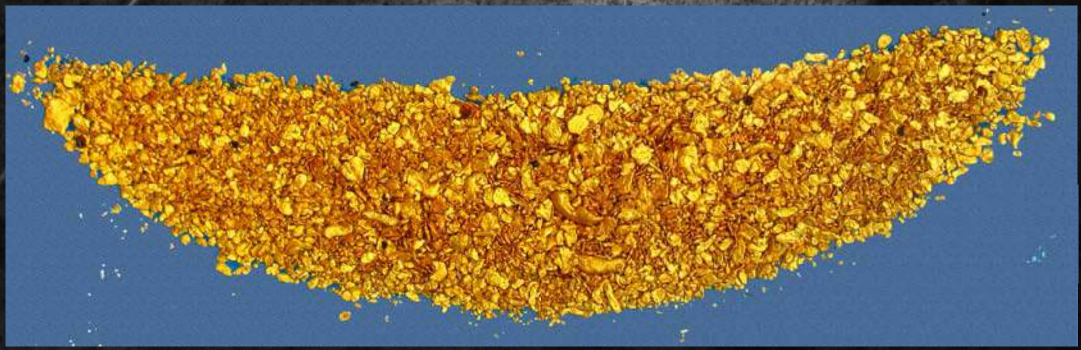
Thank You!

EquatorGold

Gold in South Sudan

Asmara Mining Conference

October 2015



EquatorGold

South Sudan

- Independent since July 2011
- Favourable new mining law
- Minimal exploration for 60 yrs
- Ony two explorers with licences:
  - *Equator Gold (Luri)*
  - *New Kush Exploration and Mining (Kapoeta)*
- Gold areas largely unaffected by recent conflict

EquatorGold

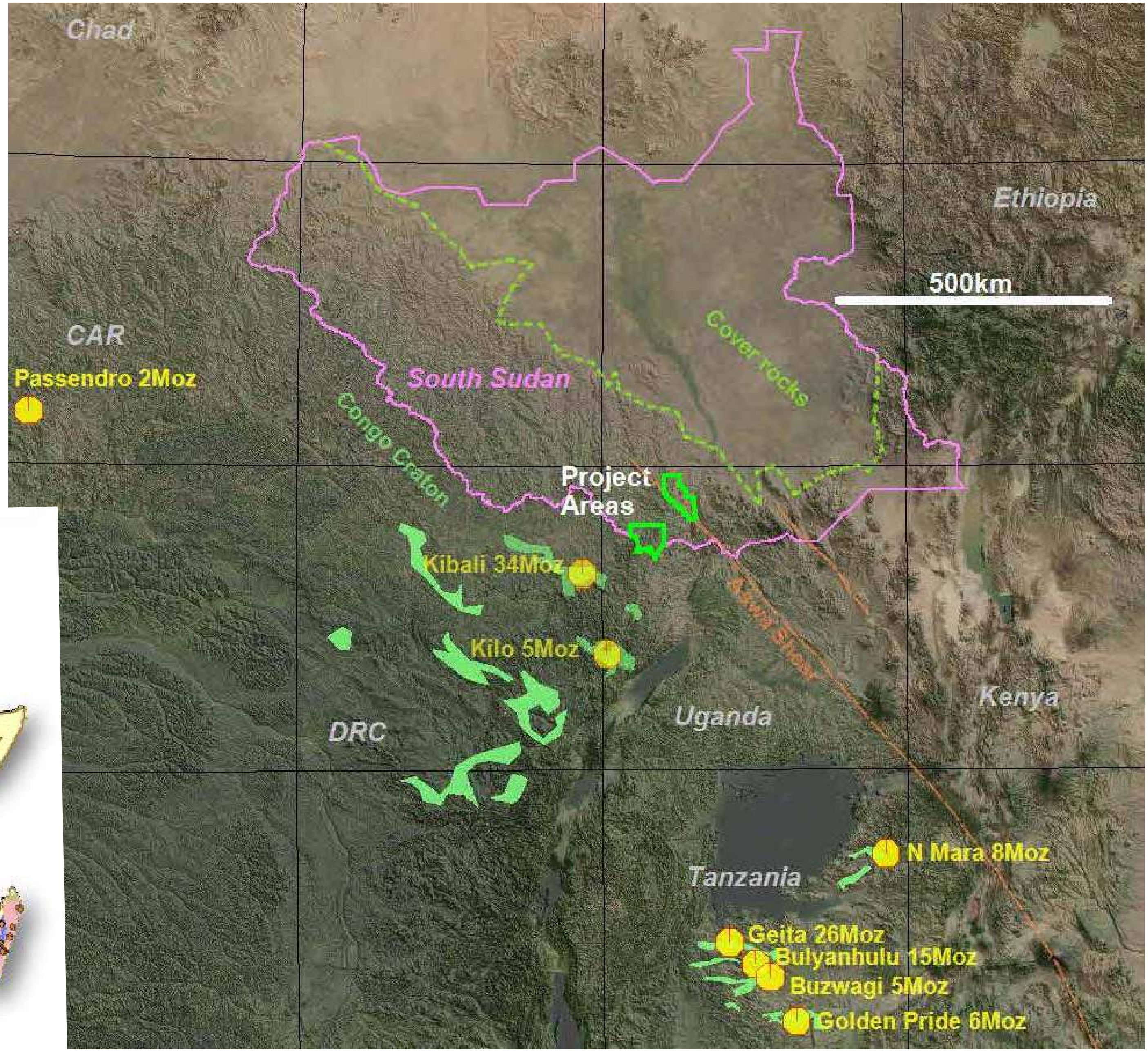
Frontier exploration ...in elephant country

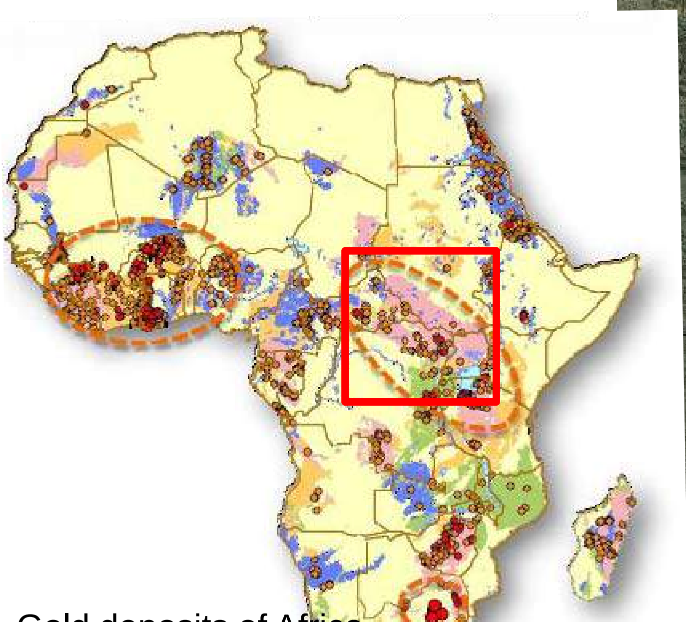
- Two major unexplored frontier gold provinces
  - *300,000km^2 Congo Craton rocks – bigger than Ghana*
  - *Significant areas of Neo-Proterozoic Arabian-Nubian Shield*
  - *Greenstone belts and crustal-scale shear zones*
  - *Close to recently-developed world-class gold deposits in Congo*
  - *Many areas of artisanal operations*
  - *Large licences available (up to 2500km^2)*
  - *No exploration for ~60 years*
  - *Good potential for high grade multi-million ounce deposits*

"South Sudan is frontier of choice for Randgold"

(Mark Bristow, Randgold CEO, February 2014)

South Sudan

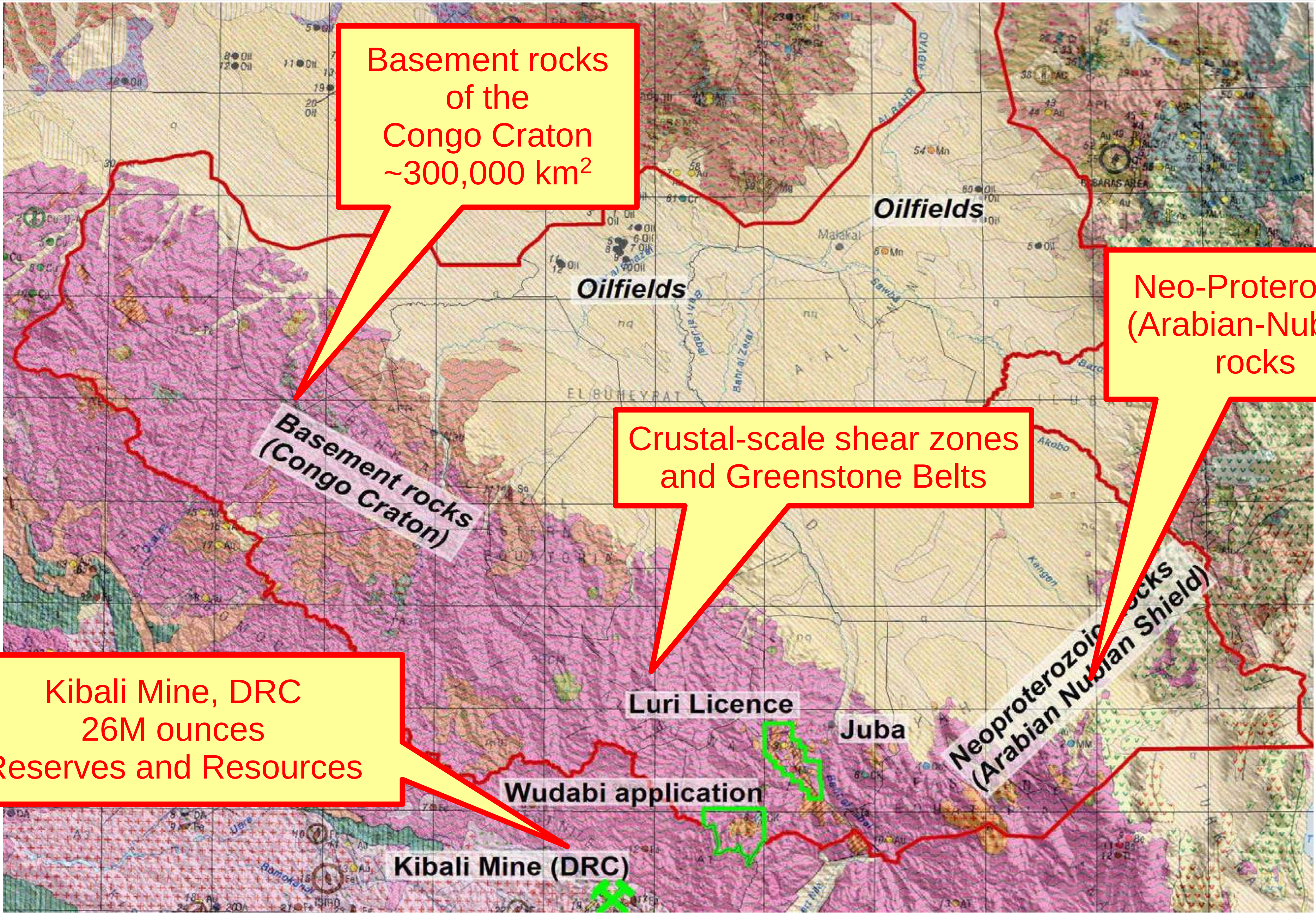




Gold deposits of Africa
(Source: Randgold)

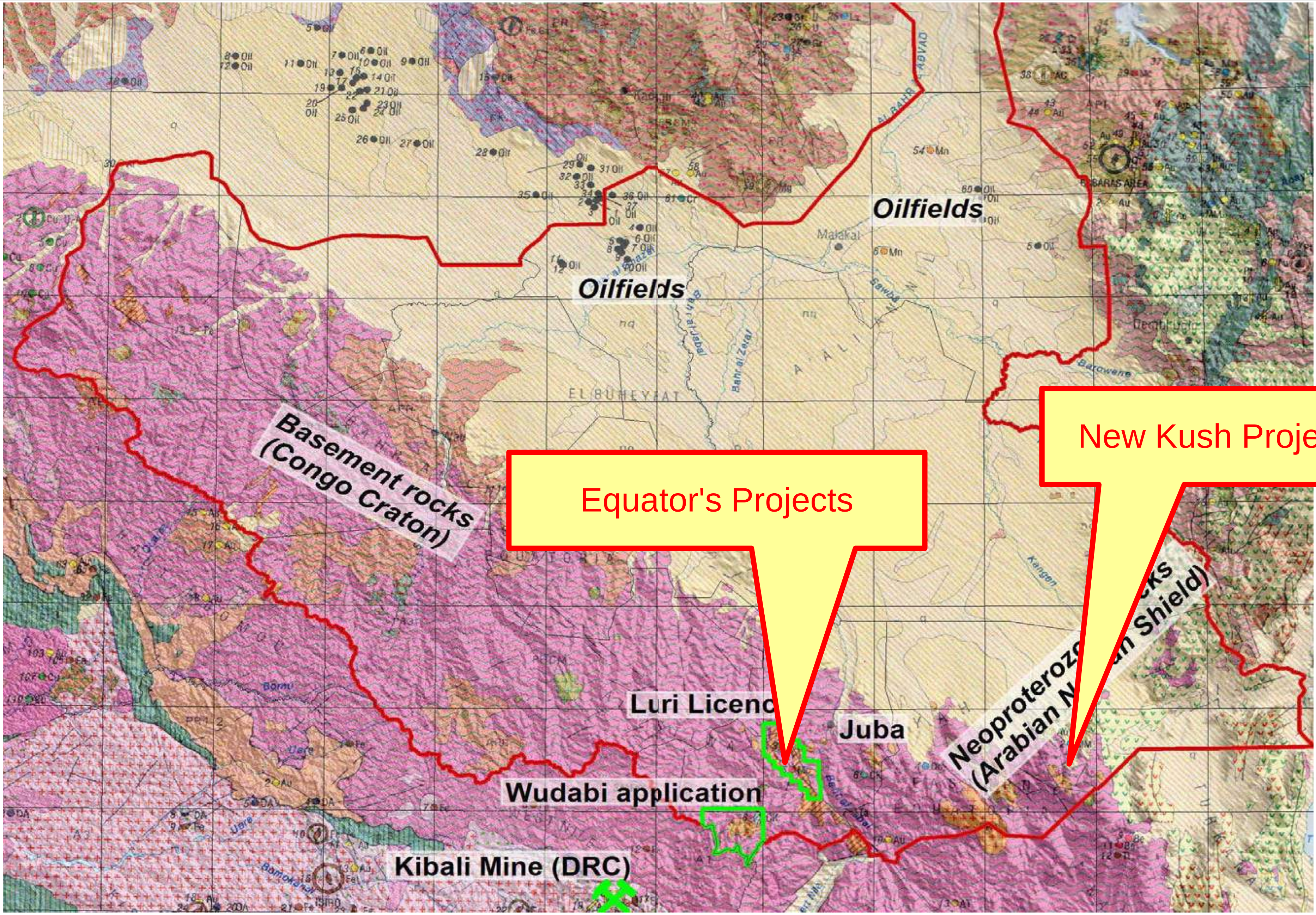
EquatorGold

South Sudan



EquatorGold

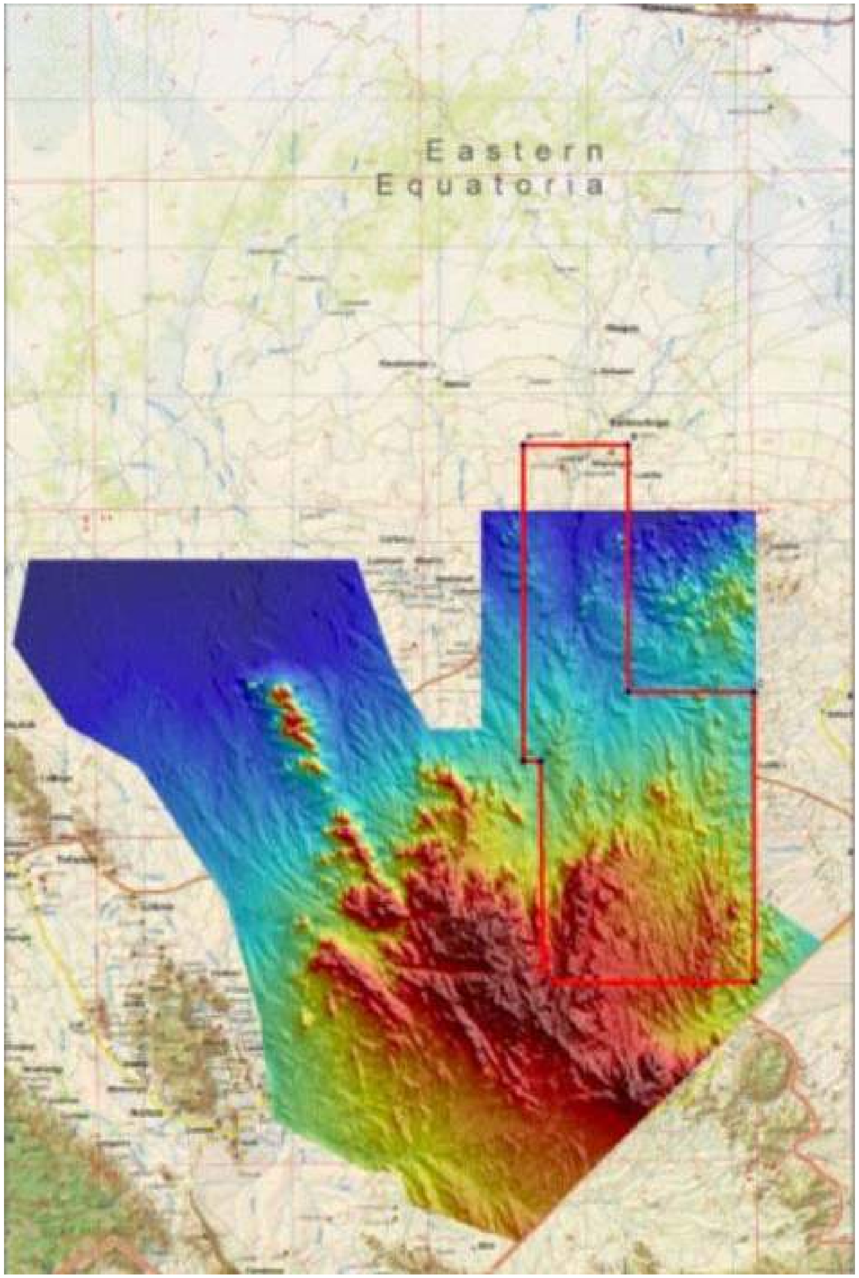
South Sudan



EquatorGold New Kush - Kapoeta

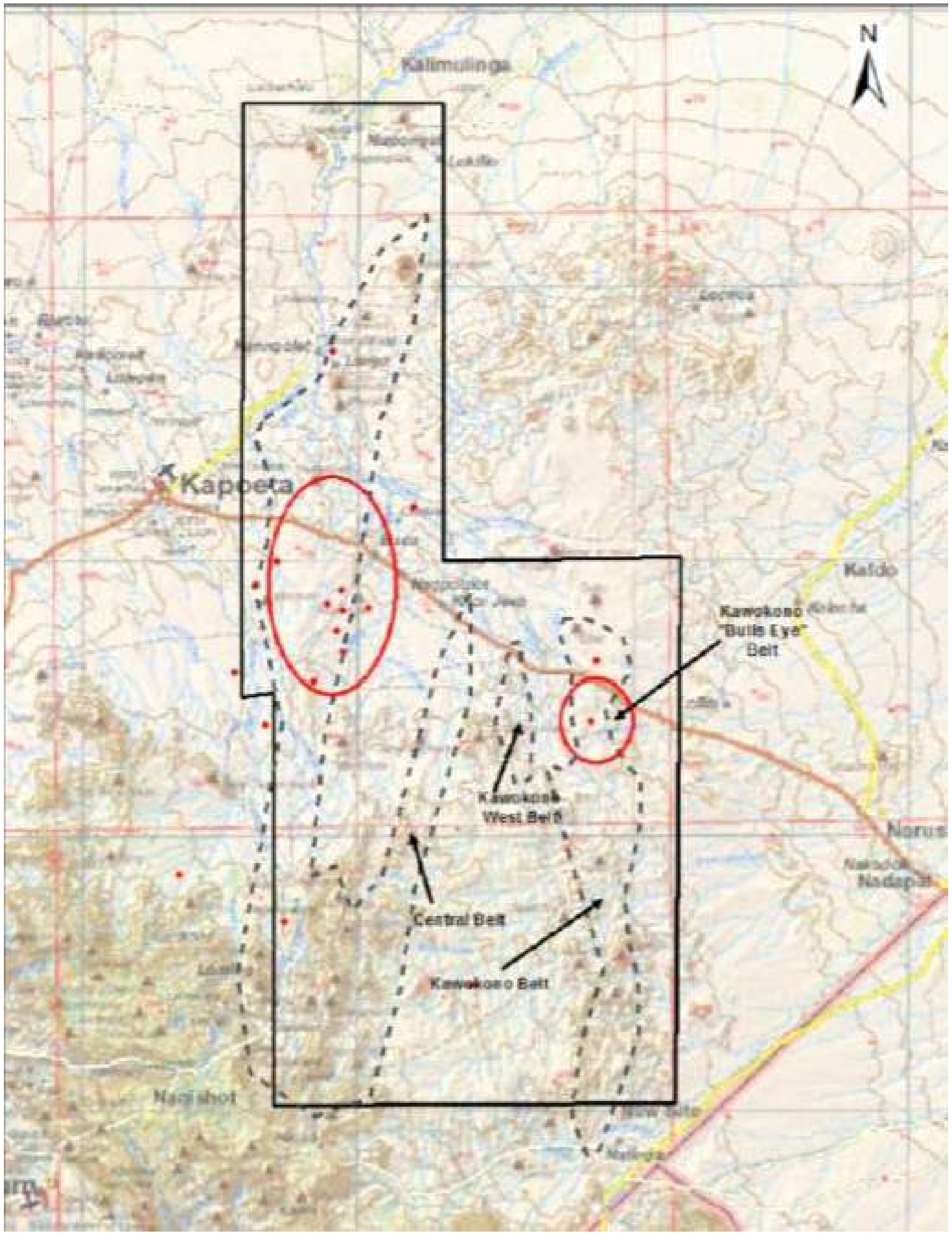
- Gold scarn deposit
  - Coarse gold in carbonates
- Prolific gold panning
  - Famous for large nuggets
- Work completed:
  - Satellite image interpretation
  - Airborne geophysical survey
  - Soil geochemistry
  - Geological mapping

Drills now on site



New Kush - Kapoeta

- Four "greenstone" belts
  - carbonates, quartz gneiss
  - amphibolites, ultramafics
  - chlorite schist
- Shear zones
- Artisanal operations
  - (Red circles on map)
- Alteration anomalies
  - Landsat and Aster images



New Kush - Kapoeta

Bulls-eye target

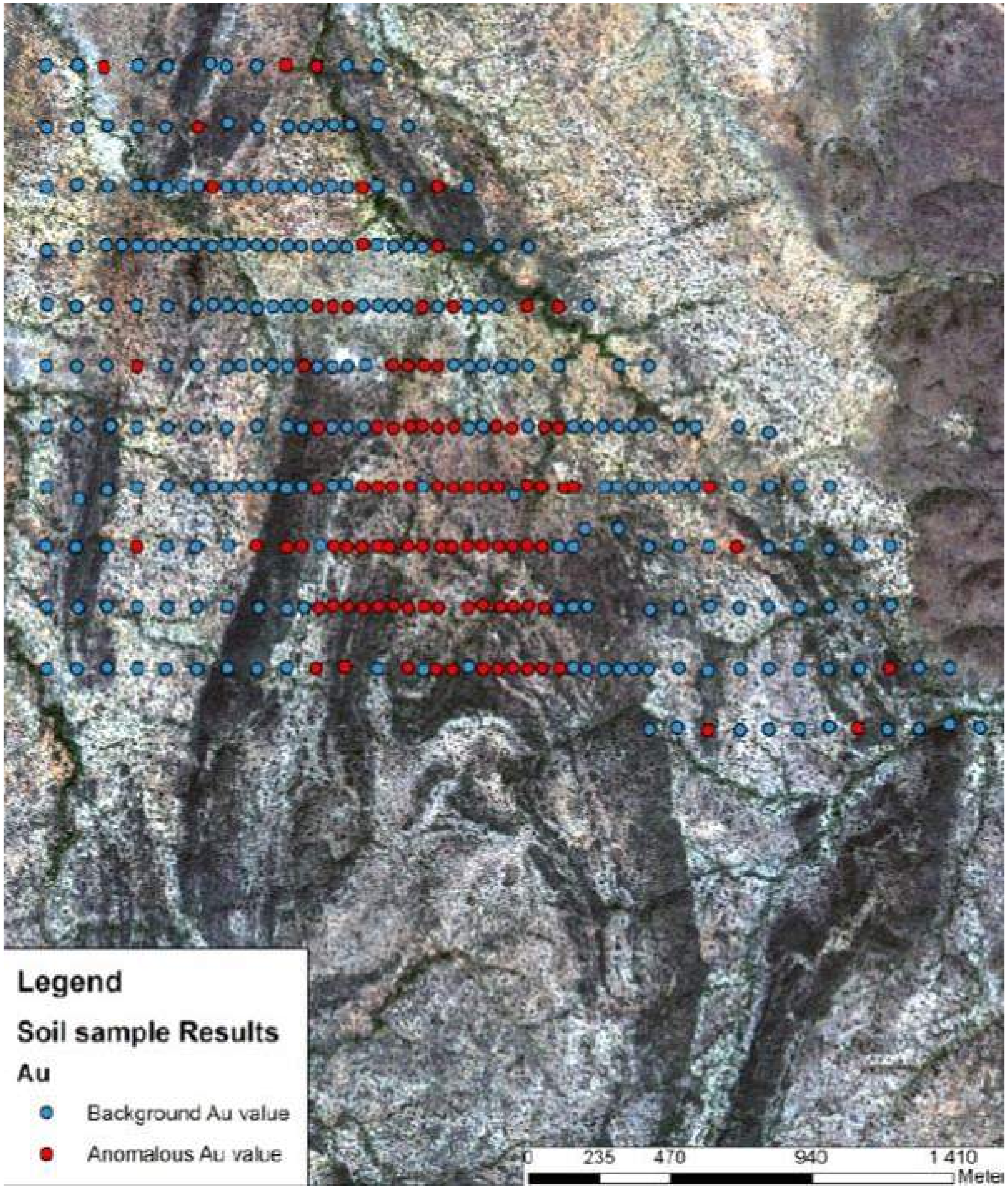
Soil anomalies up to 15g/t

Shear zones and alteration

Extensive artisanal operations

Drill targets selected

Drills now on site



EquatorGold

Luri Gold Project

- Three priority gold targets found to date
- Gold zone extends over 33km strike
- Metavolcanic (greenstone) rocks
- Previous work by Kivu Gold (2008), Hunting (1980), Belgian Aid
- Also indications of base metal and intrusion-related minerals

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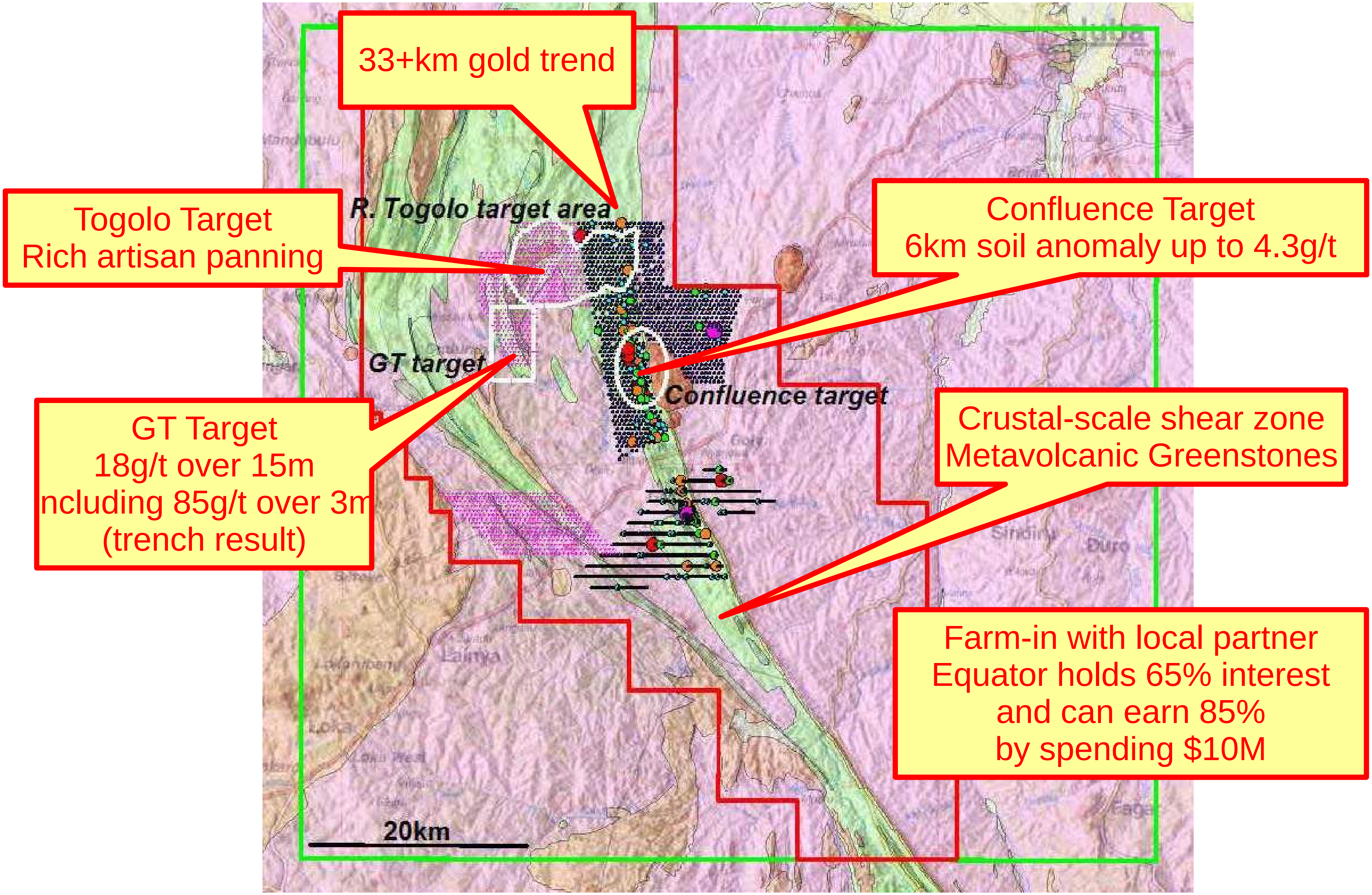
- JV with local partner (CMERIC)
- Equator can earn 65% by $1M exploration

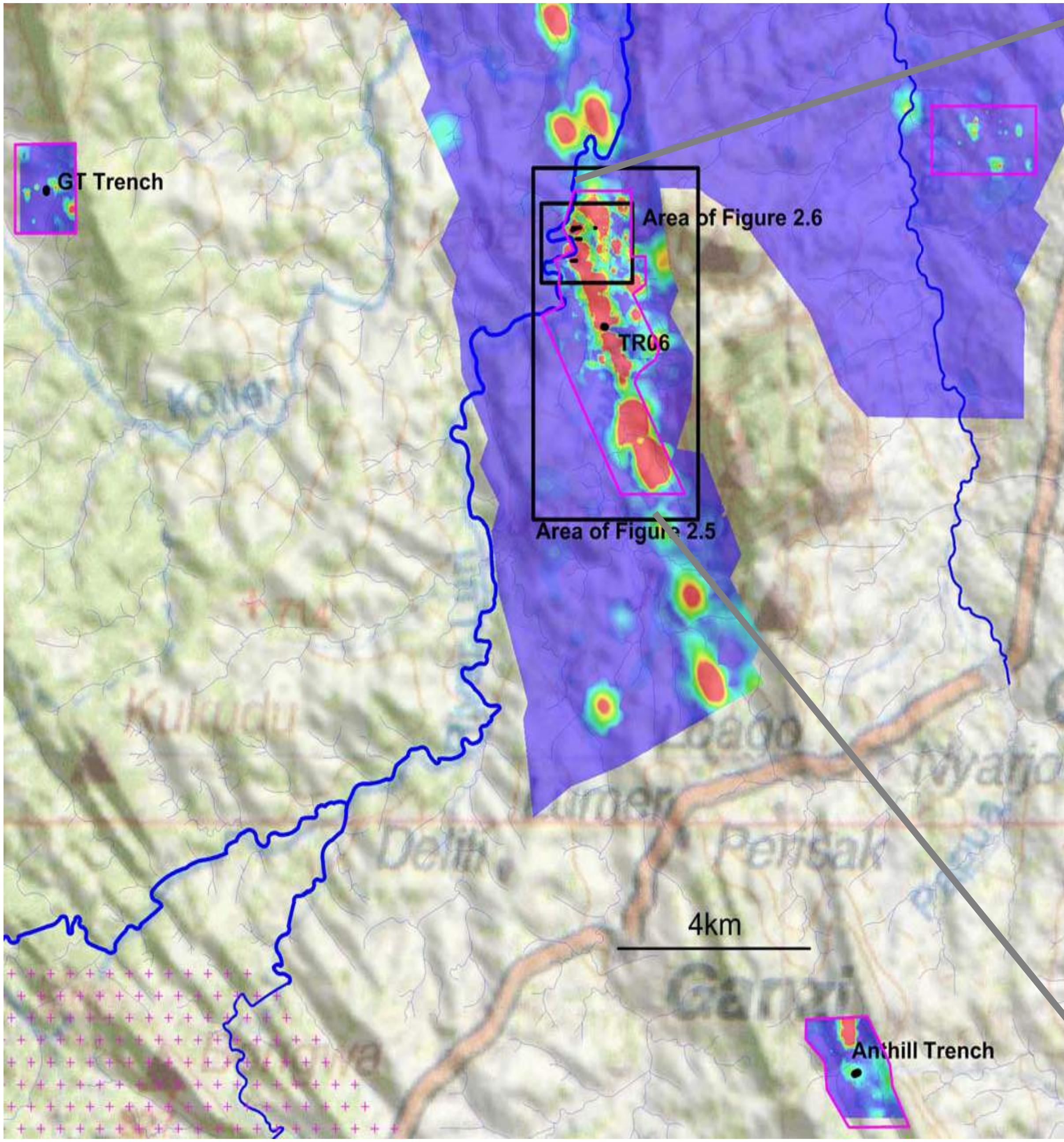
  and up to 85% by further $10M exploration

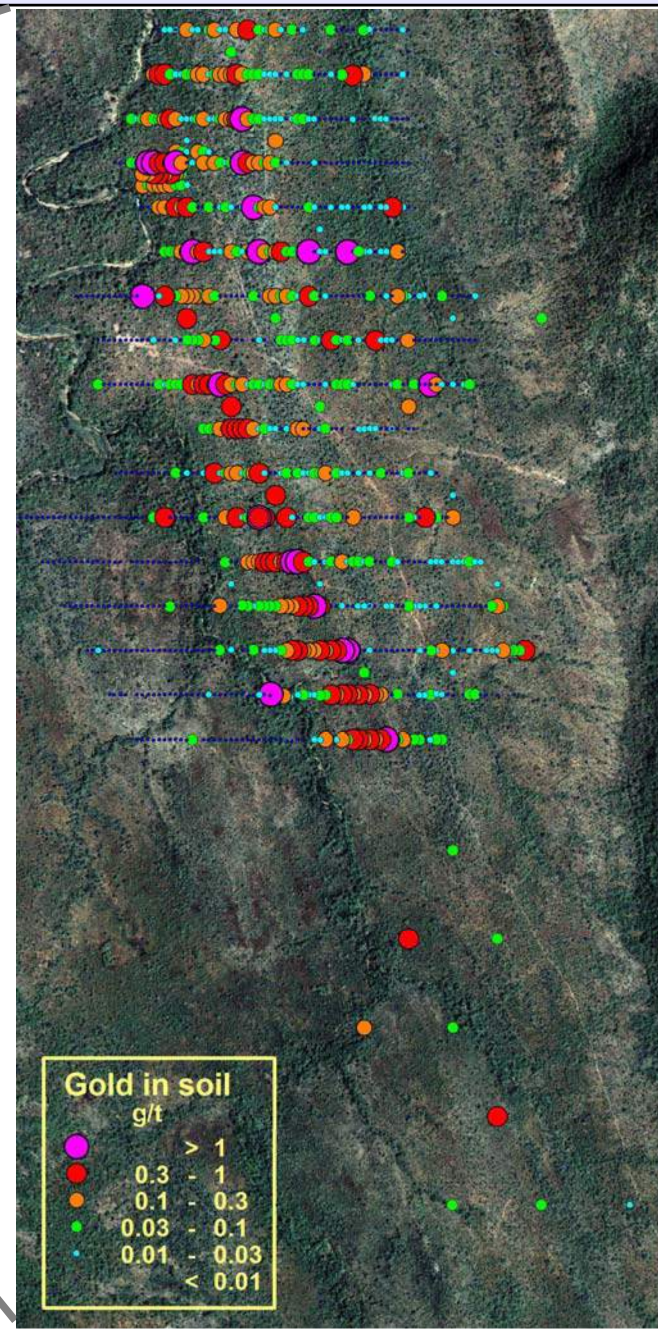
EquatorGold

Luri Gold Project



Confluence Target





EquatorGold

Localities

Clockwise from top right:

Gold-bearing quartz vein from GT target;

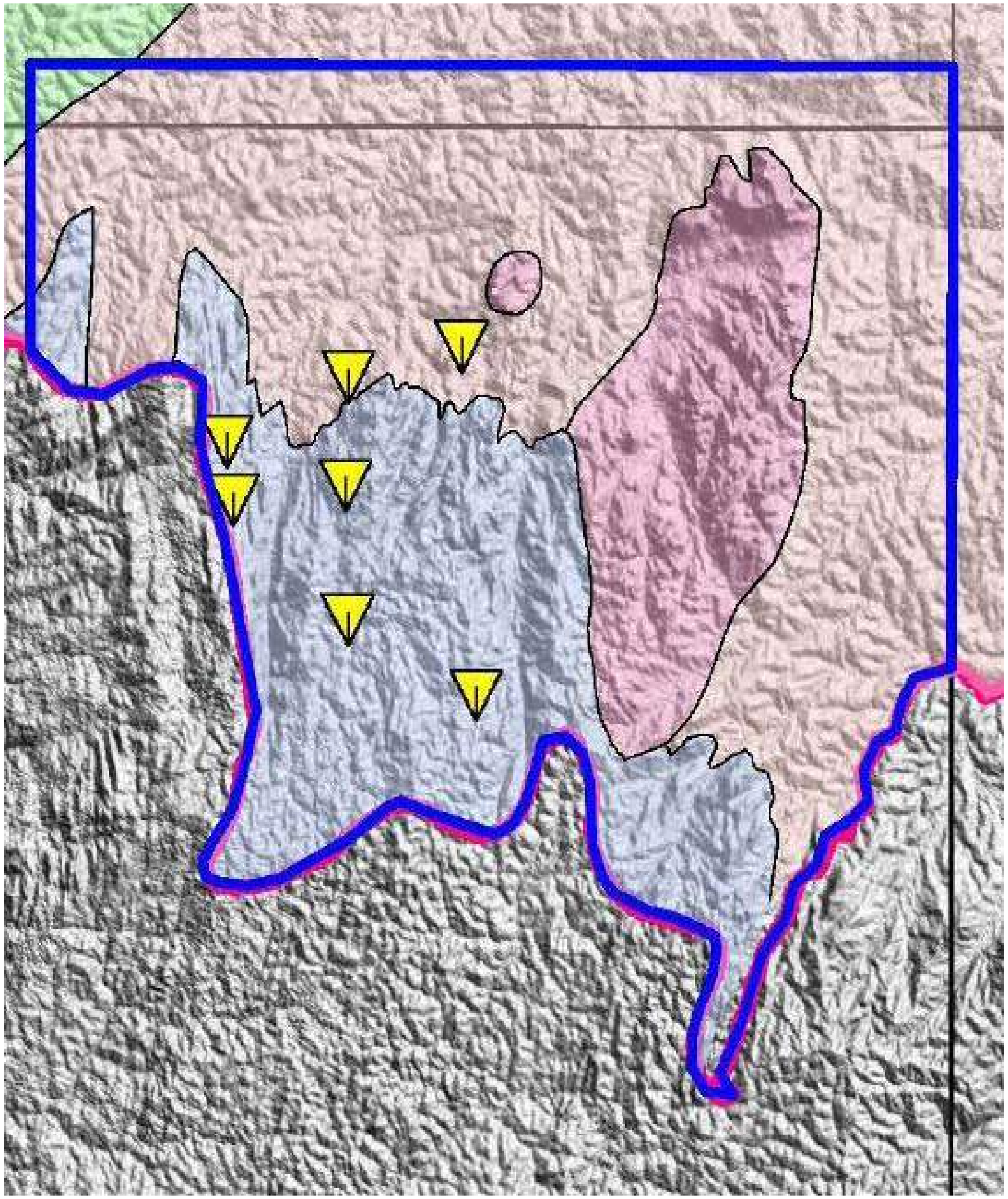
Artisan diggings at GT target;

Artisan workings of terrace deposits, R. Togolo;

Director Bob Foster and geologists inspecting pits at the Confluence Target

EquatorGold

Equator – Wudabi



New Project

Farm-in with S Sudan company

Metavolcanic greenstones (light blue)

Extensive artisanal panning (yellow triangles)

Licence applied for

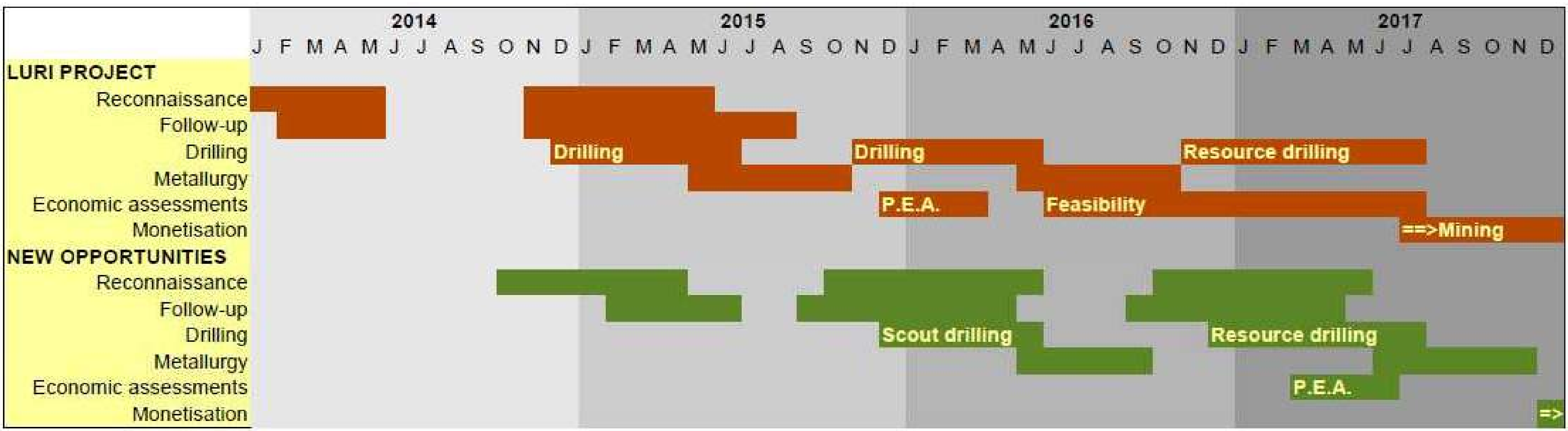
EquatorGold

Goals and plans

GOAL 1: Evaluate first discoveries

GOAL 2: Extend coverage within and beyond Luri

GOAL 3: Monetise discoveries



EquatorGold

Directors and Management

Directors of Equator Gold Holdings Ltd

Mark Parker, BA, MIMMM (Managing Director)
An exploration geophysicist and mineral exploration entrepreneur with 38 years experience in exploration and corporate management in Africa, Europe, Southeast Asia, Latin America and the Middle East. Also Chairman of Andiamo Exploration and former MD of African Eagle

John Carlile, BSc, MSc, DIC, FAusIMM, FGS (Non-executive Director)
A Jersey-based geologist with more than 35 years in mineral exploration, mostly gold and base metals in the East Asian region, especially Indonesia. With multi-national companies (BHP, Utah, MEM and Newcrest) from 1979 to 1996, then joined Indonesian company PT Austindo Nusantara Jaya, serving on boards of group companies including Pearl Energy (Chairman, 2003 to 2006) and ARC Exploration (MD/CEO 2008 to 2013).

William J G Bennett (Independent Non-Executive Director)
An English solicitor based in Jersey, William set up Garfield-Bennett Trust Company Limited, undertaking trust and company work and services business. Sits on the boards of a number of companies including property and investment holding and is a trustee on a number of private client trusts. William is also a director of a property fund and a distressed asset fund that invests in European and Asian business

Michael Paul Egerton-Vernon (Independent Non-Executive Director)
A Solicitor, he spent five years in the City and become legal director for International Process Industries. He established his own practice in 1978 and was a partner in Nigel Harris & Partners in Jersey, becoming head of Rathbones worldwide trust division. He is a director of Channel Islands subsidiaries of several FTSE 100 and other companies and funds.

Technical Advisory Group and Directors of Equator Gold Ltd

Emma Parker, BSc, MSc, TEFL; COO
Environmental scientist with experience on exploration and mining projects, with 10 years in eastern and central Africa and Korea. USA fund-raiser and former Administrative Manager of NGO running an orphanage in Tanzania.

Jeff Malaihollo, BA, PhD, FGS, MAusIMM
Founder of GGG plc and Managing Director until its merger in 2012 with Bullabulling Gold Limited. Former Executive Director at London corporate financiers specialising in natural resources. Previously geologist working on generative programmes with Newcrest, Rio Tinto and Billiton.

Bob Foster, BSc, PhD, FIMMM, CEng, FGS,CGeol
Professional economic geologist, CEO of Stratex International plc. 37 years global experience in exploration, mining, and academic posts incl. Southampton University. Expertise in gold genesis and exploration.

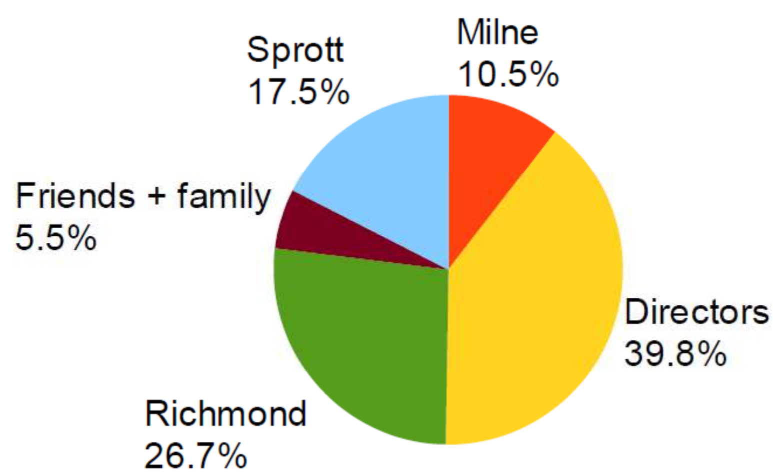
Geert Trappeniers MSc, (Exploration Manager)
Geert has 16 years exploration experience as an exploration geologist and project manager in Africa, Europe and the Middle East, including gold, diamonds, base metals and industrial minerals.

Company Profile

- Equator Gold Holdings Ltd
  - Jersey public company (unlisted)
  - Project-specific subsidiaries
  - UK service subsidiary
  - Branch office registered in S Sudan

- 200,001 shares in issue

- £1.7M invested to date



Equator Gold Summary

South Sudan is the world's most promising frontier exploration destination

We believe that Luri is a world-class project with a high probability of containing several multi-million ounce gold deposits.

Equator's top priority is to advance the project to resource evaluation as quickly as possible.

EquatorGold

Disclaimers

Document

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This document includes forward looking statements. All statements other than statements of historical fact included in this document regarding the business, financial condition, results of operations of the Company, or any Group Company and certain plans, objectives, assumptions, expectations or beliefs with respect to these items and statements regarding other future events or prospects, are forward looking statements. Should one or more of the risks or uncertainties associated with such forward looking statements materialise, or should assumptions underlying such forward looking statements prove incorrect, actual results may vary materially from those described herein. Neither the Company nor any Group Company assume any obligation to update or correct the information contained in this document, whether as a result of new information, future events or otherwise. ● These statements include, without limitation, those concerning: strategy and the ability to achieve it; expectations regarding sales, expenses, profitability and growth; possible or assumed future results of operations; capital expenditure and investment plans; adequacy of capital; and financing plans. The words “aim”, “may”, “expect”, “anticipate”, “believe”, “future”, “continue”, “help”, “estimate”, “plan”, “intend”, “should”, “could”, “would”, “shall” and similar terms or the negative or other variations thereof, as well as other statements regarding matters that are not historical fact, are or may also constitute forward looking statements. In addition, this document includes forward looking statements relating to potential exposure to various types of market risks, such as foreign exchange rate risks, interest rate risks and other risks related to financial assets and liabilities. ● These forward looking statements have been based on the current view of the Directors with respect to future events and financial performance. These views reflect the best judgement of the Directors but involve a number of risks and uncertainties which could cause actual results to differ materially from those predicted in forward-looking statements and from past results, performance or achievements. Although it is the belief of such persons, that the estimates reflected in the forward looking statements are reasonable, such estimates may prove to be incorrect. By their nature, forward looking statements involve risk and uncertainty because they relate to events and depend on circumstances that may occur in the future. There are a number of factors that could cause actual results and developments to differ materially from those expressed or implied by these forward looking statements, including the following: economic downturn, recession, acts or threats of terrorism, acts or the threat of war or other adverse political developments in key markets, legislative and regulatory changes, failure to protect intellectual property rights or any infringement claims, termination of arrangements with third parties for any reason, litigation and future exchange and interest rates.

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SUPPLY CHAIN LINKAGES

Nahom Tesfay

IN HOST COUNTRIES

Why Linkage with local Suppliers?

Lean Production Capability
Q-C-D. Supply Chain: Low inventories; Rapid response

Long-Run
- Closer to suppliers
- Reduce risk

”This adds **resilience** to the supply chain ... You have **a source that you know and that is local**. You also have **a choice**, which **reduces the risk** for your operations.” *(Spano, Christian; Anglo American)*

Reputation building
Social concession

Future concessions
Also in other countries

“Window dressing” local supply

Not pleading for local content regulation (ownership)

Substitution
mining company import
by local firm import

Higher cost

No value added

Lose-lose situation

Local manufacturing and service delivery
- Local Firm
- Foreign supplier Subsidiary

Closer to supply

Local value added

Win-win situation

LOCAL PROCUREMENT IN GHANA

Initiative Mining Industry Ghana

Increase annual local supply Spending
$120 million → $200 million

Examine capacity of
local enterprises

Identified 27 product categories that
can be made locally

ANGLOGOLD
ASHANTI

NEWMONT

NEWMONT local procurement Ghana

- Broadening access to local suppliers

Formal registration by suppliers	**Advertising available contracts**	**Supplier open days**	**open tendering**	**Publish local spending data on quarterly basis**

- Preference in assessing tenders

Local-Local → **Ghanaian owned** → **Ghanaian participation** → **Ghana-registered** → **International**

Ahafo mine 2007-2010

- **Trained 53 local suppliers**
  $14 million in local procurement

INVESTMENT ANGLO ZIMELE

South Africa AngloAmerican

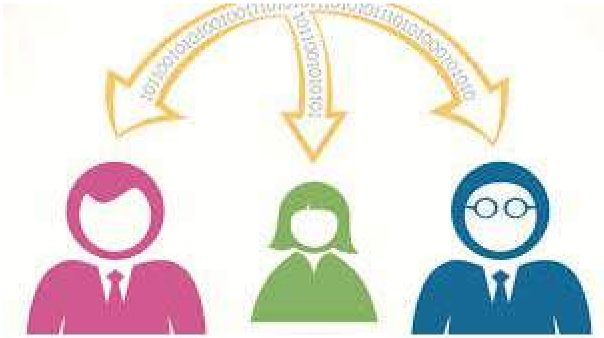
Anglo Zimele Investment

• Equity stake (20 percent)
• Finance up to $470.000
• Capital dependence reduced over time

Partner-shareholder
- **Board member**
- **Corporate governance**
- **Protect investment**

- **(2004-2007) net profit 2.5 million**
- **72% of SMEs survived 8 years or longer**

Anglo Zimele



Bite size tenders

Easier access for local SMEs

"Incubator" approach

Business development officers
Small Business Hubs

- Transferring business skills; Provide technical training; Enhance financing skills; Secretarial, accounting, and tax help

RESEARCH & DEVELOPMENT (R&D)

Chile

CSIRO Chile

Research for mining equipment, technology and service sector

Mining companies

- Anglo American, Antofagasta Minerals, BHP Billiton, and Xstrata Copper
- Codelco

Research Centres

- CSIRO (Australia)
- CICITEM (Chile)

Universities

- University of Antofagasta
- University of Chile

Supplier Program Chile

Solutions in mining desired by BHP Billiton

Collaborate with local suppliers to find solutions

Provide consultancy support to suppliers
Management; Corporate Governance; Strategic Planning; Marketing

Invested > $50 million

Savings (est.) $121 million

BHP Billiton and Prodinsa

Snapping of
shovel cables

40 percent increase
shelf life cables

Export

- Peru
- Venezuela
- Brazil

Lessons

1) Local sourcing

- Identify product categories
- Identify local SMEs
- Bite size tenders

2) Equity and loans

- Different SMEs to spread risk
- Provide a board member
- Have a clear exit strategy

3) Training of suppliers

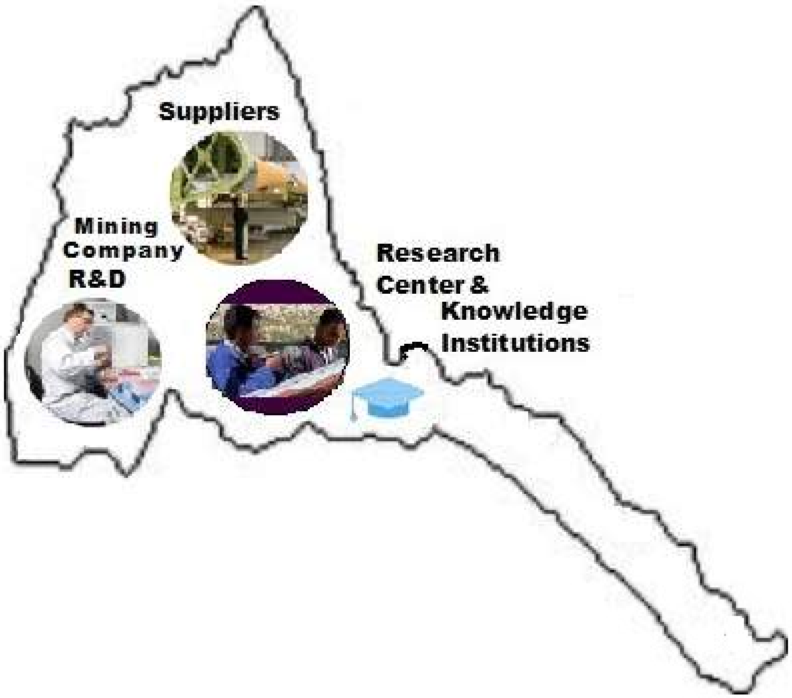
- Business skills
- Financing skills
- Technical skills

4) R&D collaboration

- Mining companies
- Suppliers
- Knowledge institutes

A cord of three strands is not quickly broken
ብሰለስተ ዝኸረረ ገመድ ቀልጢፉ ኣይብተኽን።

Ecclesiastes - መጽሓፍ መክብብ 4:12



Appendix

Examples

- Uniform, Clothing, shoes
- Catering, Food
- Safety equipment
- Equipment maintenance
- Engineering services

Lessons Procurement

Identify goods and services that can be produced locally

Enterprise map
Together with Ministry Trade & Industry

Tenders
- Open access
- Bite size tenders

Preference for local value added
(no “window dressing”)

Tesra and Sixth Sense Processware

- Local firm Tesra and Canadian technology partner Sixth Sense Processware
- Reduced electricity consumption per tonne of copper by two percent
- Automatic scanning system
  - Detecting short circuit
  - Helps operators to fix them in the electro-winning plant

Biohydro.cl

- BHP Billiton commissioned Biohydro.cl with
  - Automating the wetting phase in copper leaching process
    - Minimize exposure operators to acid mist
    - Reduce variability of the wetting phase process

- Solution by Biohydro.cl
  - Reduced variability of the wetting phase from seven percent to less than one percent
  - Reduced water consumption
  - Increased mineral recovery

Micomo

Developer of communication and information solutions

- A previously unavailable forecast system assessing a combination of elements (weather Geography Operational activities)
  - Predicts with 75 percent accuracy the likely level of dust output up to 48 hours in advance op planned activities
  - Enables to schedule activities with greater certainty
  - Minimize dust experiences
  - Reduce costly last-minute changes in work schedules

R&D Collaboration

Supplier

Industry

Knowledge Institutions

Rio Tinto Mine of the Future

IGATE Patni, India

- Modify and adapt innovations at other centers, for broader application

Collaboration with Chinalco, China

- To develop new mining technology

CSIRO Chile

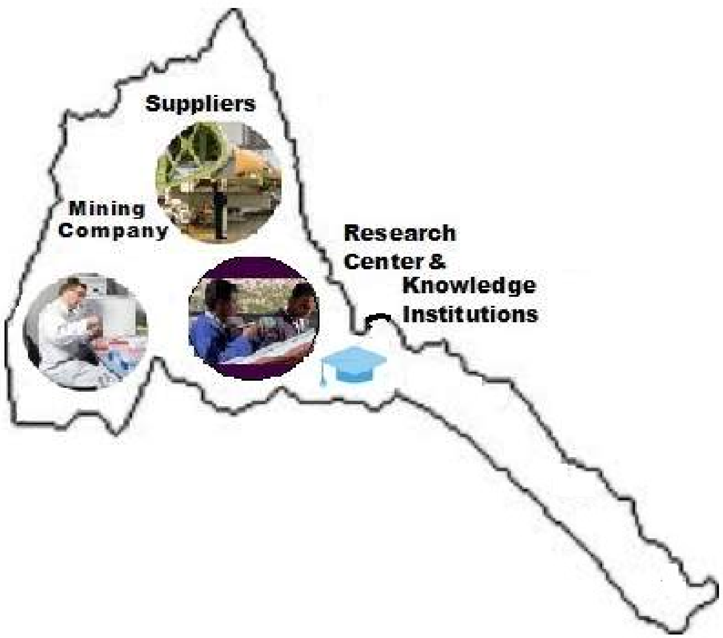
Anglo American, Antofagasta Minerals, BHP Billiton, and Xstrata Copper, and Codelco

- CSIRO (Australia), and CICITEM (Chile)
- University of Antofagasta, and University of Chile

A cord of three strands is not quickly broken

ብሰለስተ ዝኸረረ ገመድ ቀልጢፉ ኣይብተኽን።

Ecclesiastes - መጽሓፍ መክብብ 4:12



R&D for Mining

Collaboration

- Mining Suppliers
- Local Universities and Research Centers
- Industry
  - AMIRA, Australia
  - CAMIRO, Canada

- Enhance productivity
- Increase recovery
- Reduce cost
- Product innovations
- Better business performance

Innovations Mine of the Future

Gravity gradiometers

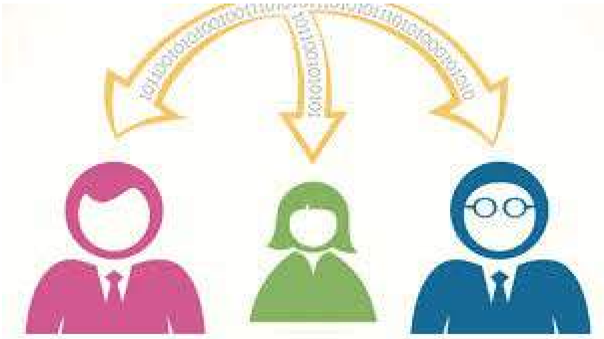
Autonomous Trucks

Remote operations

Robotic tire machines

ENHANCE QUALITY OF SUPPLY

Knowledge transfer → Reduce input cost → Improve competitive Position



Why Linkage with local Suppliers?

Reputation building

Social concession

Future concessions
Also in other countries

Lithogeochemistry of Host Rocks to the Bisha Cu-Zn-Au Volcanic Hosted Massive Sulphide Camp, Eritrea

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Asmara Geo-Congress - Sept./Oct. 2014

Background

Bisha Mining Camp has 4 VHMS deposits (Bisha & Harena)

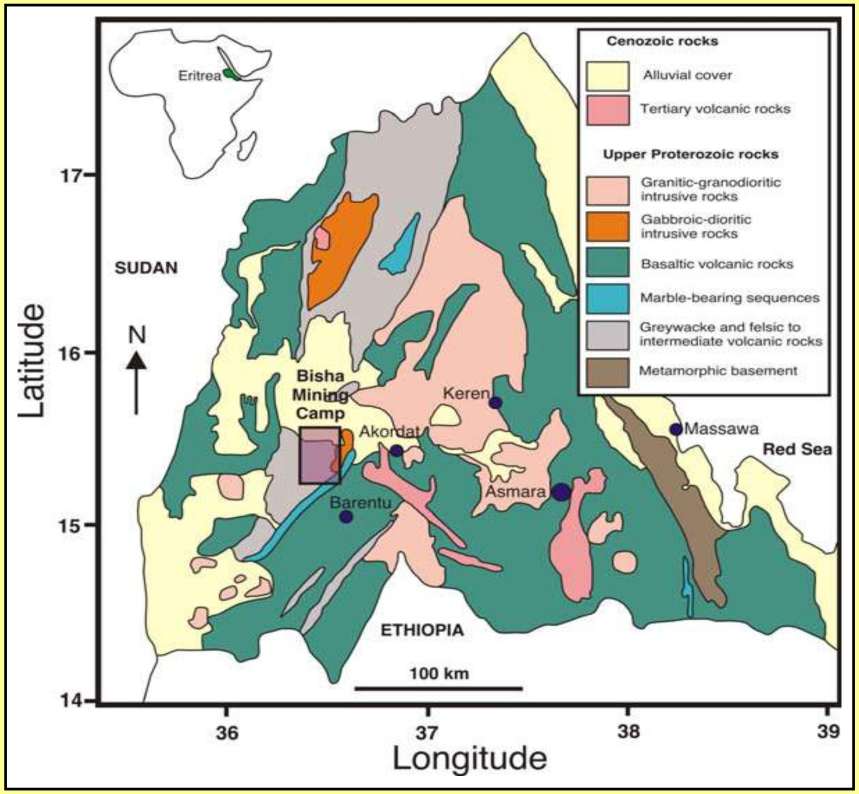
It is located in a granite-greenstone belt, the Nakfa Terrane in the Arabian-Nubian Shield in Western Eritrea

Hydrothermal alteration & metamorphism overprint the host rocks, modifying compositions, textures & mineralogy

Only chlorite alteration was recognized in the camp

Deposits were thought to be at the same stratigraphic horizon (~ 9 km apart)

Detailed stratigraphic columns & hydrothermal zoning models needed to be developed for the camp



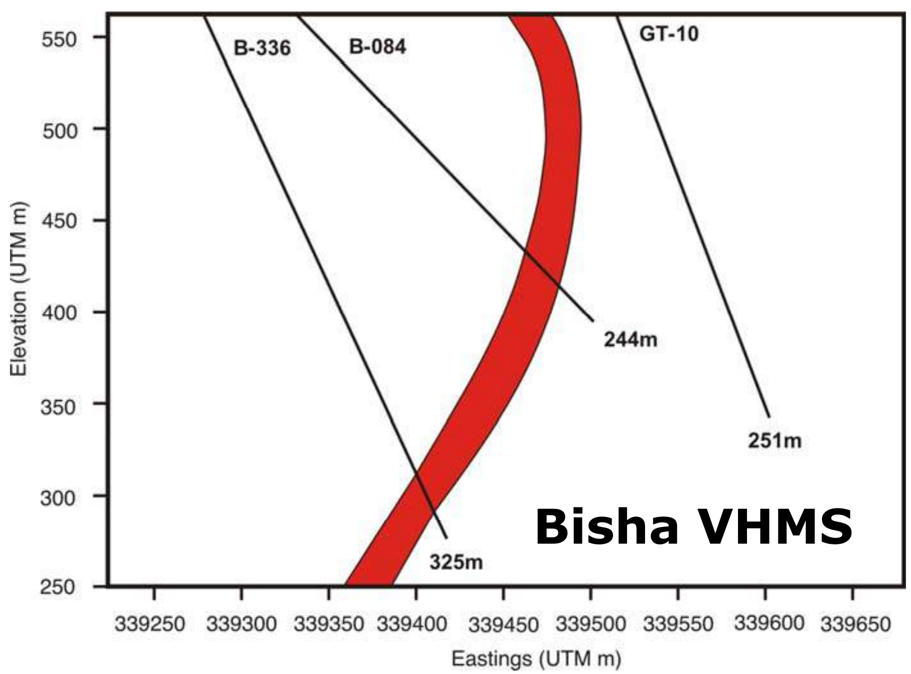
Background

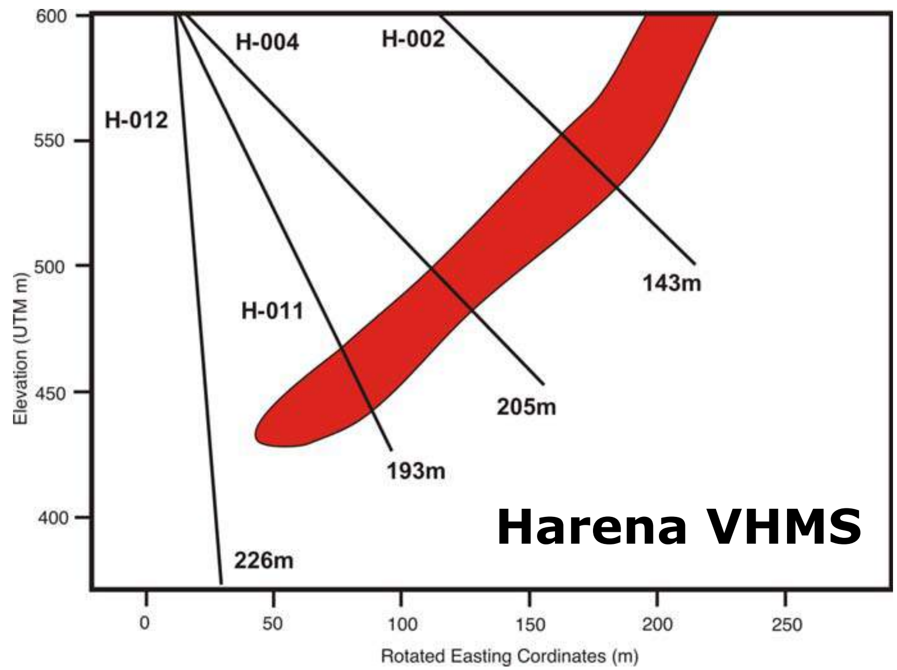
Logged 7 drill cores through the Bisha and Harena deposits

Collected 282 samples for petrography & lithogeochemistry

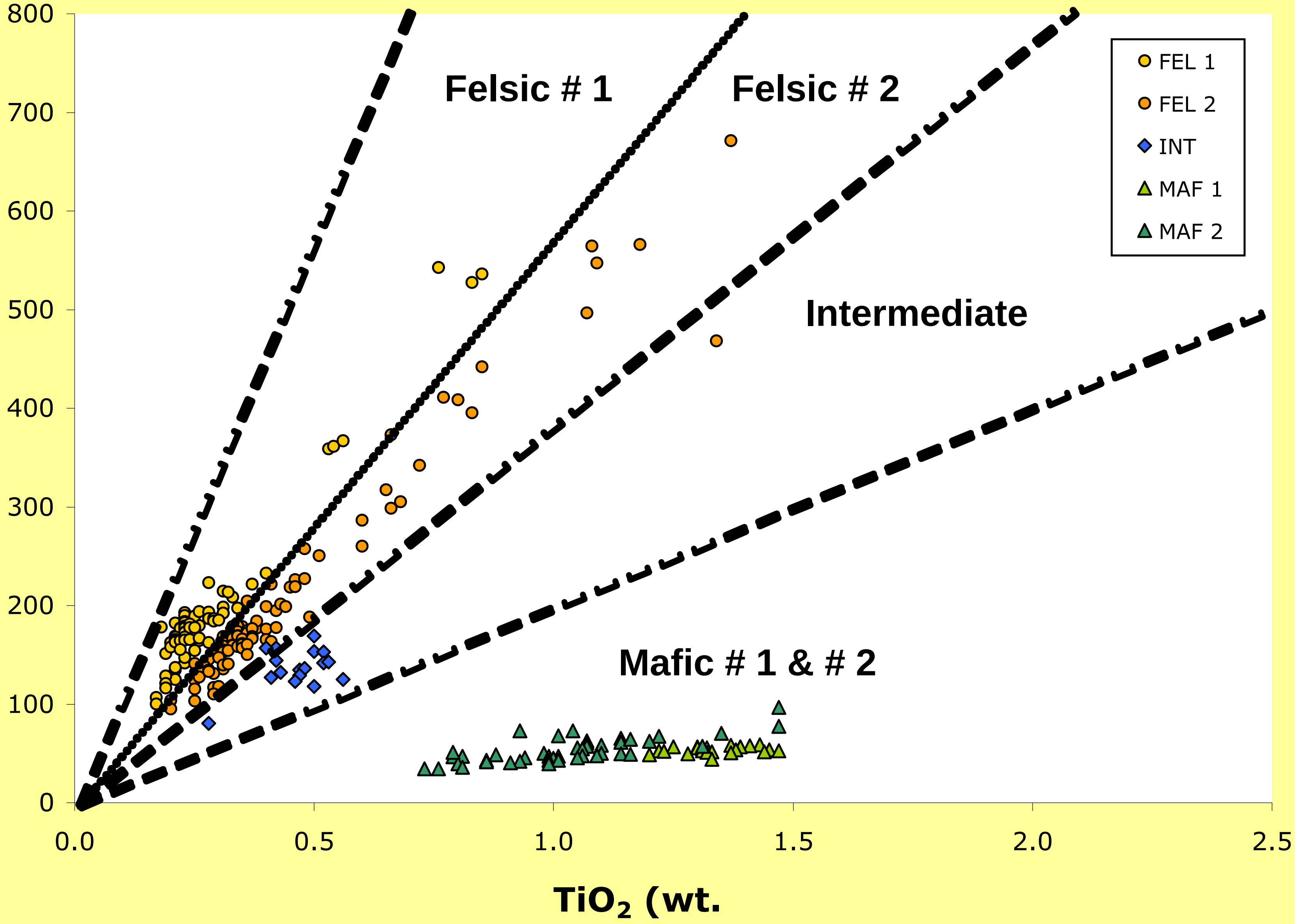
Pulverized samples were analyzed by fusion-ICP methods for 10 major oxides, 47 trace elements, plus total C & S

Data quality assessment using 100 QAQC samples indicates that results are 'fit for purpose'





Conserved Element Analysis



Lithogeochemical Classification

Mafic : $Zr/TiO_2 < 200$

Mafic 1: $Zr/P_2O_5 < 110$

Mafic 2: $110 < Zr/P_2O_5$

Intermediate : $200 < Zr/TiO_2 < 380$

Felsic : $Zr/TiO_2 > 380$

Felsic 1: $Zr/TiO_2 > 570$

Felsic 2: $380 < Zr/TiO_2 < 570$

Comparison
(*w/Hallberg, 1984*)
Basalt
$Zr/TiO_2 = 100$
Andesite
$Zr/TiO_2 = 500$
Dacite
$Zr/TiO_2 = 1500$
Rhyolite

		DDH Log			Sampling		
		MAF#	***INTM***	***FEL#***	***MAF#***	***INTM***	***FEL#***
LGC	***MAF#***	**6**	35	44	**4**	3	81
	INTM	2	**3**	17	1	**0**	20
	FEL#	1	53	**86**	3	2	**166**

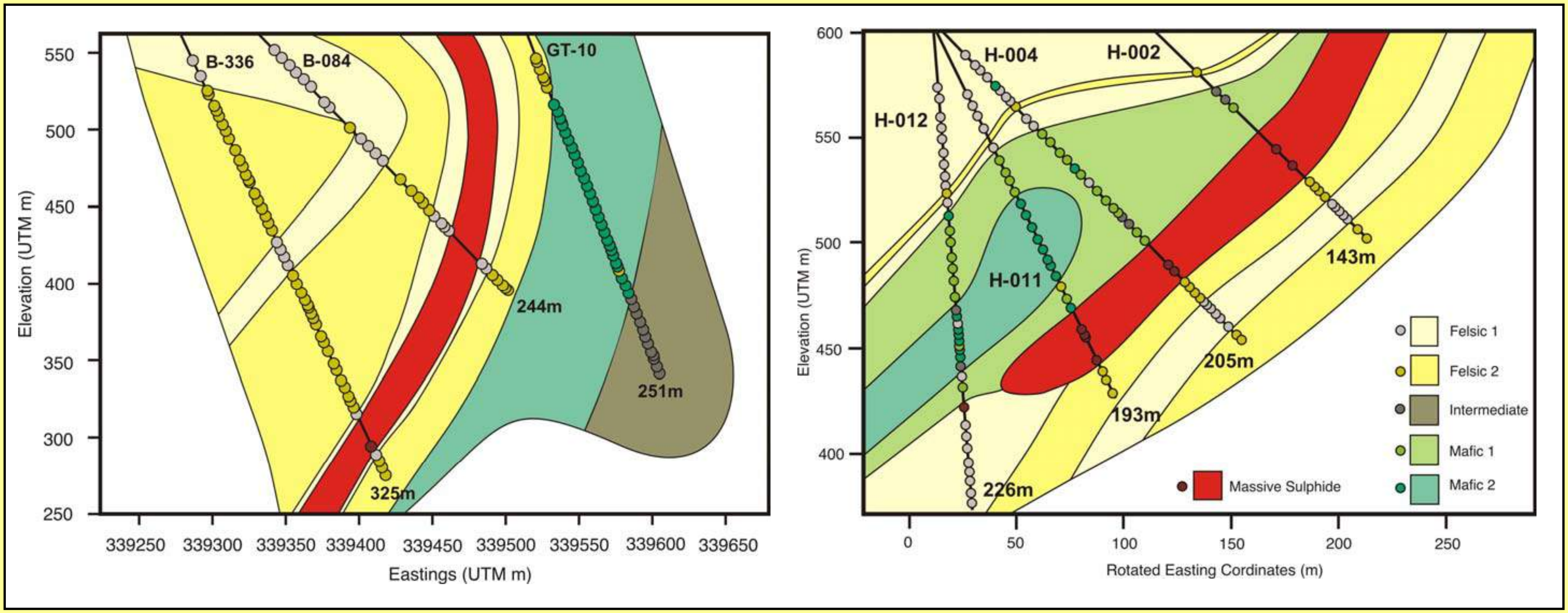
38 % Correct ***61 % Correct***

Stratigraphy

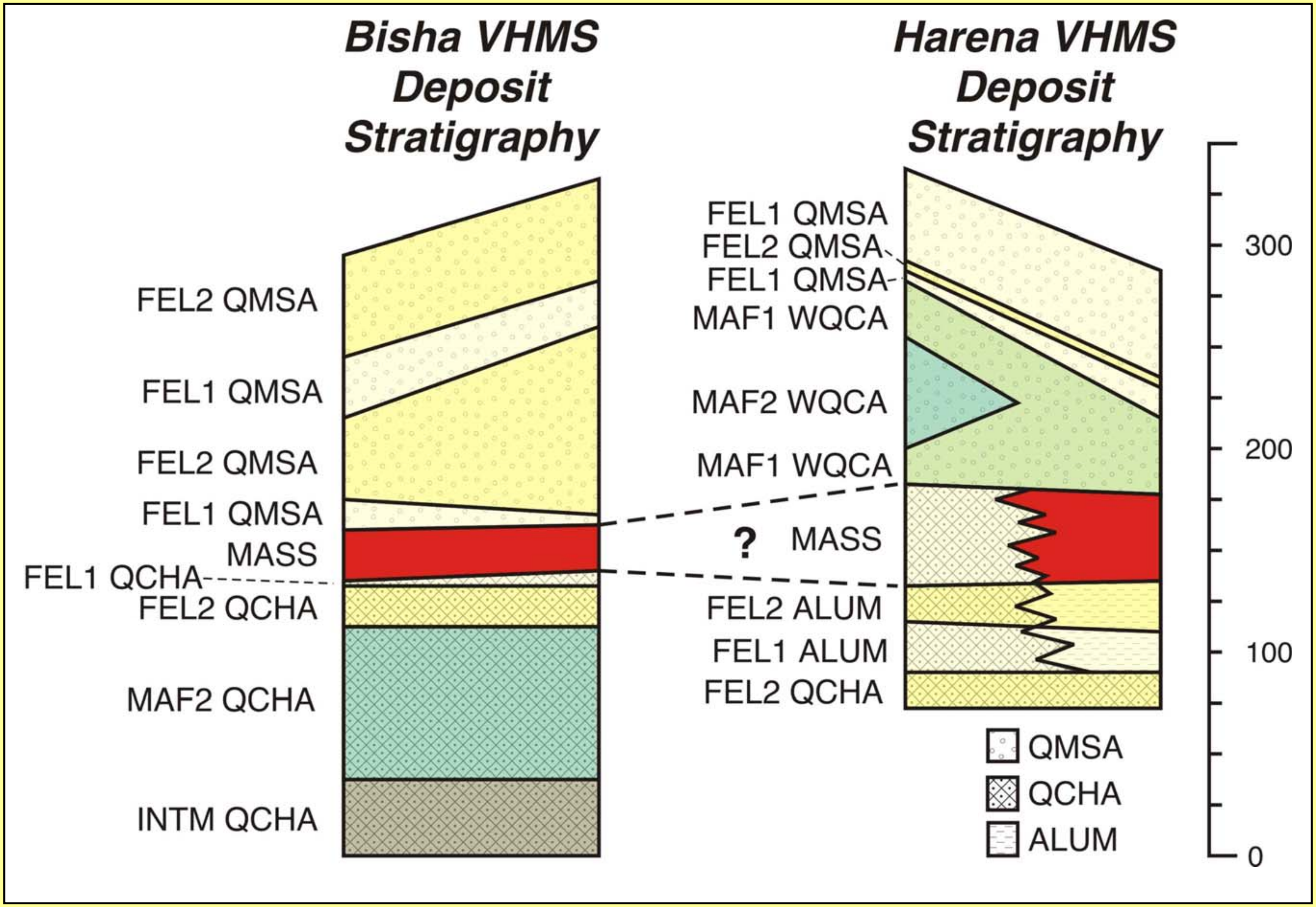
Chemostratigraphic analysis identified 5 different volcanic units:
- 2 felsic (rhyolite & rhyodacite), 1 intermediate (dacite), & 2 mafic (basalt) volcanic compositions

Both Bisha and Harena deposits have felsic volcanic rock footwalls

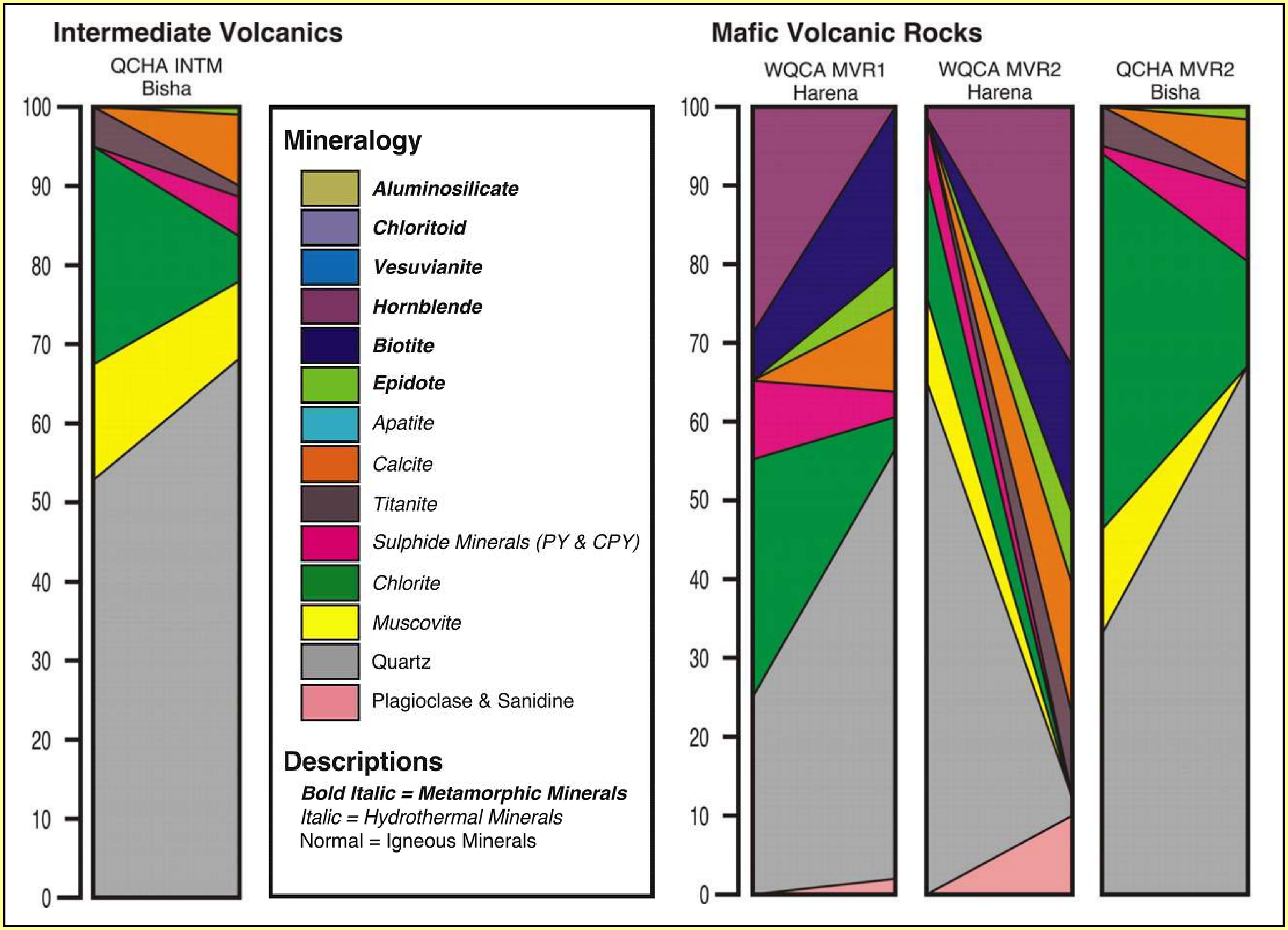
Bisha VHMS **Harena VHMS**



Stratigraphy



Petrography



Petrography

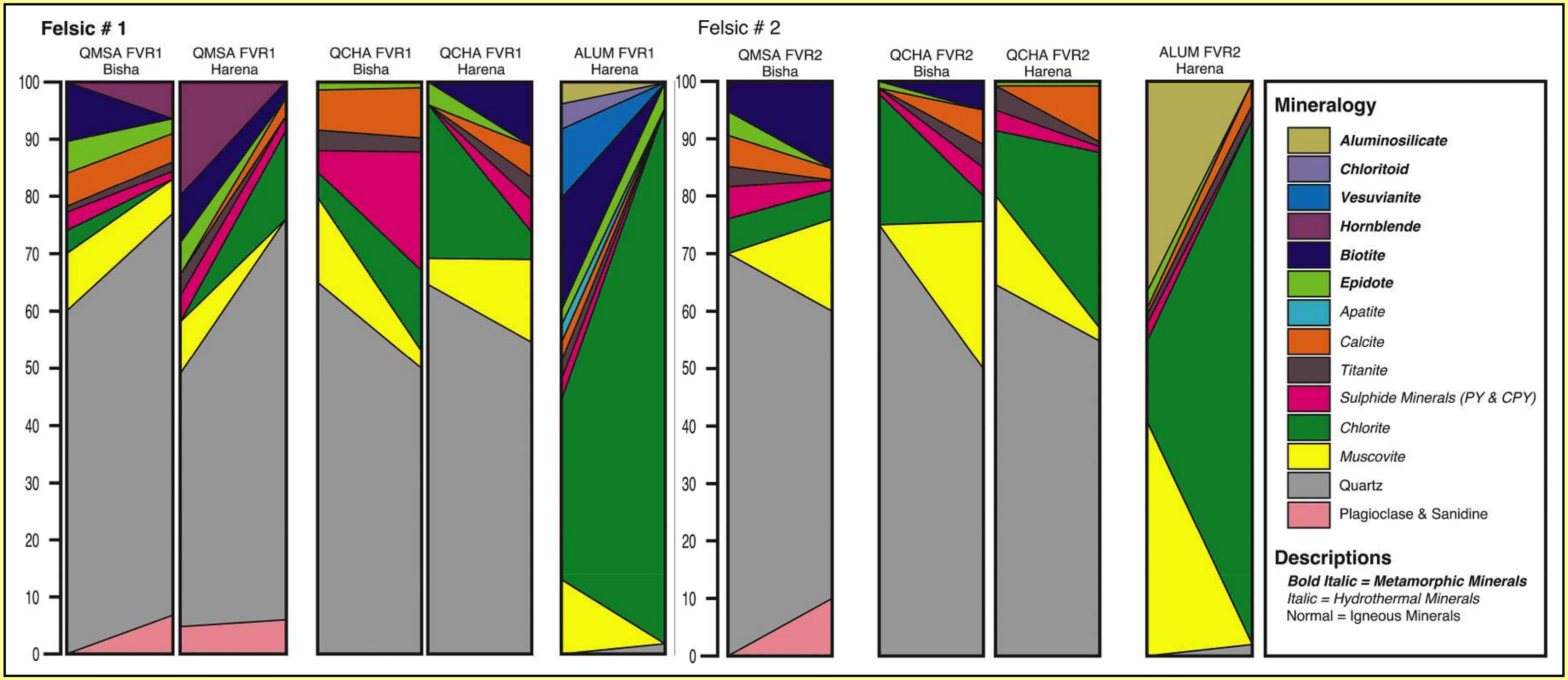
Igneous Minerals: FELD, QTZ

Hydrothermal Minerals: CHL, MUS, QTZ, SX, CAL, AP, TIT

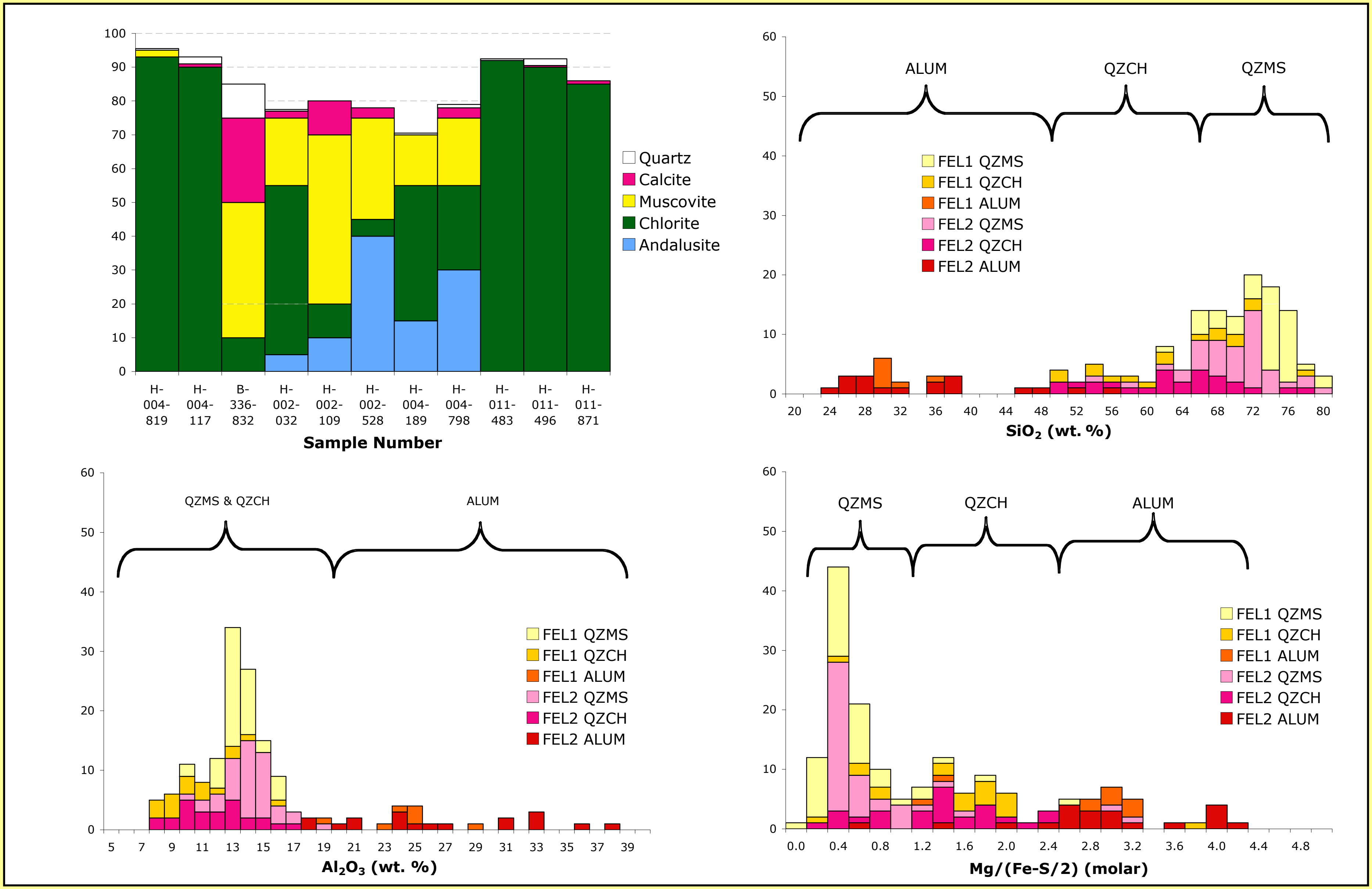
Metamorphic Minerals: HB, BT, EP, CTD, AND, VES

Mafic rocks contain CHL, some QTZ, and minor MUS

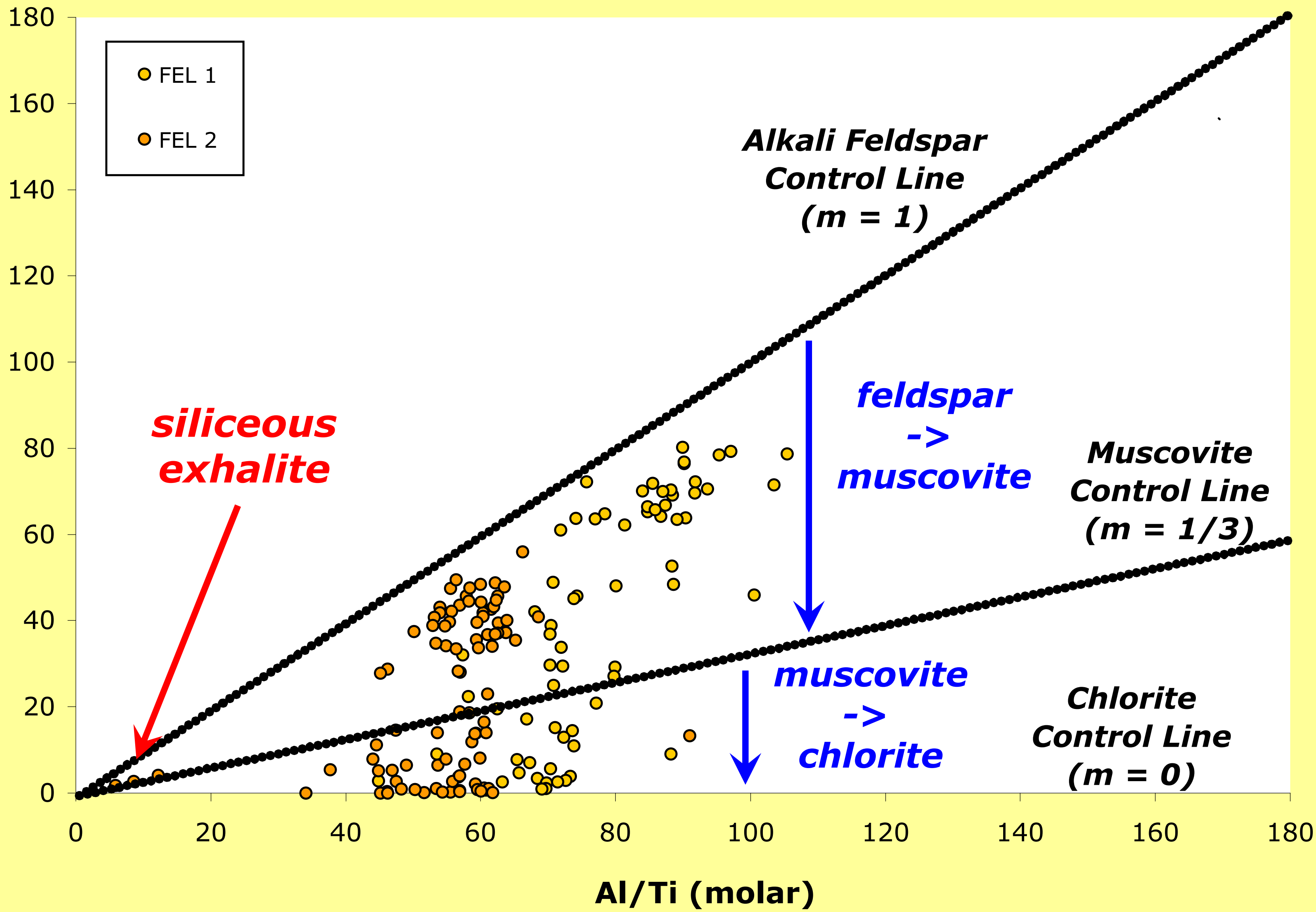
All felsic rocks contain MUS & CHL, contain significant QTZ



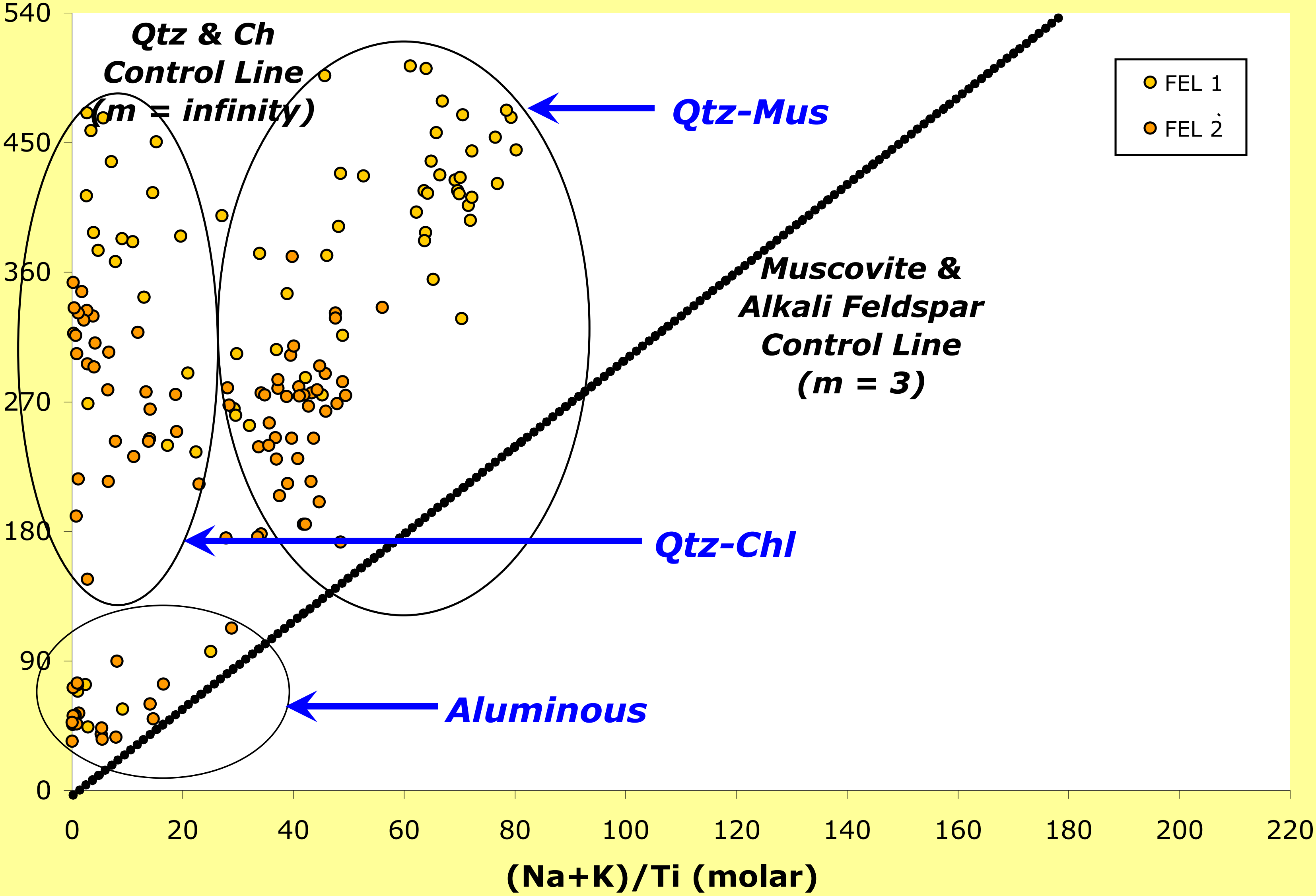
Aluminous Alteration



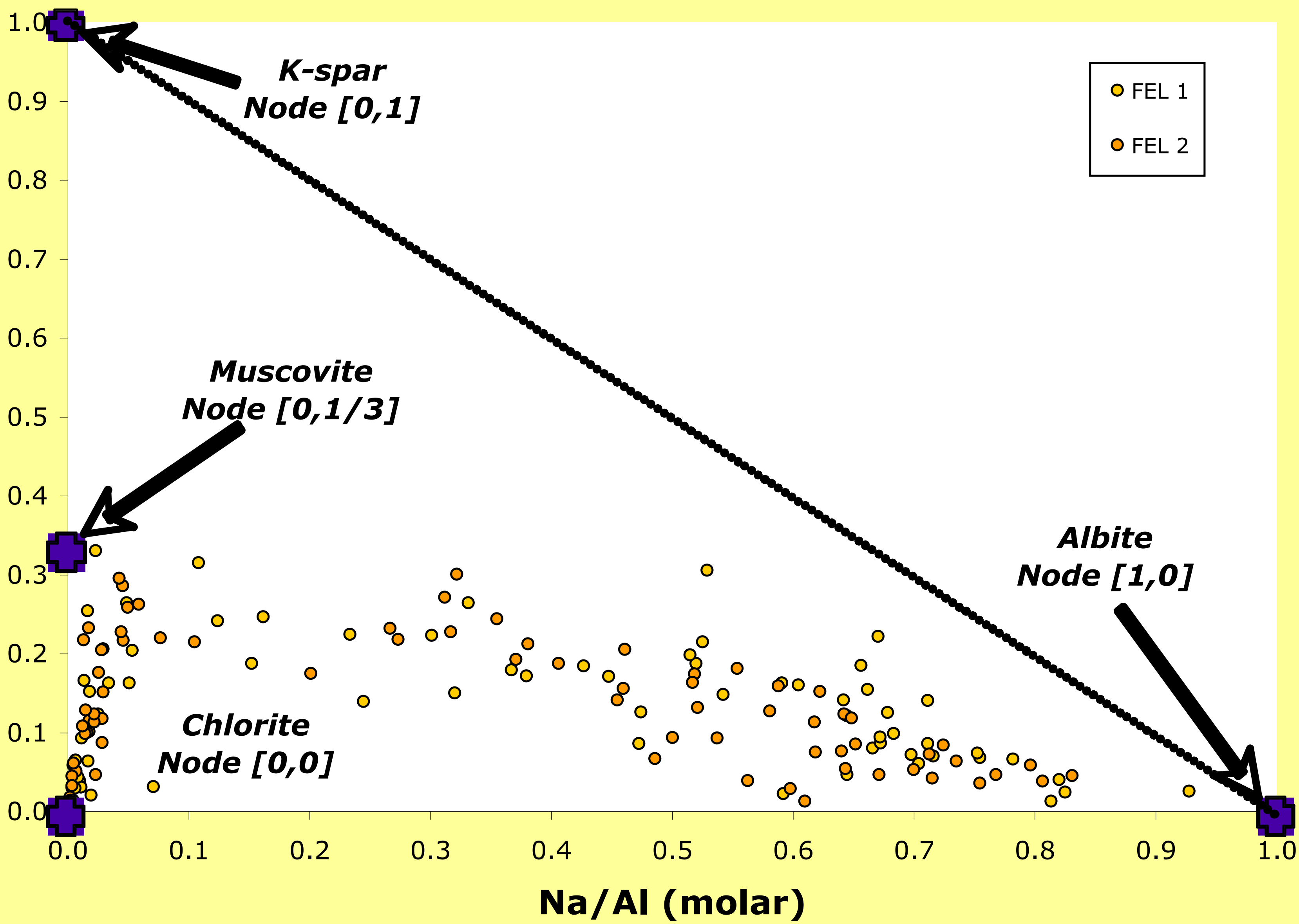
Molar Element Ratio Analysis



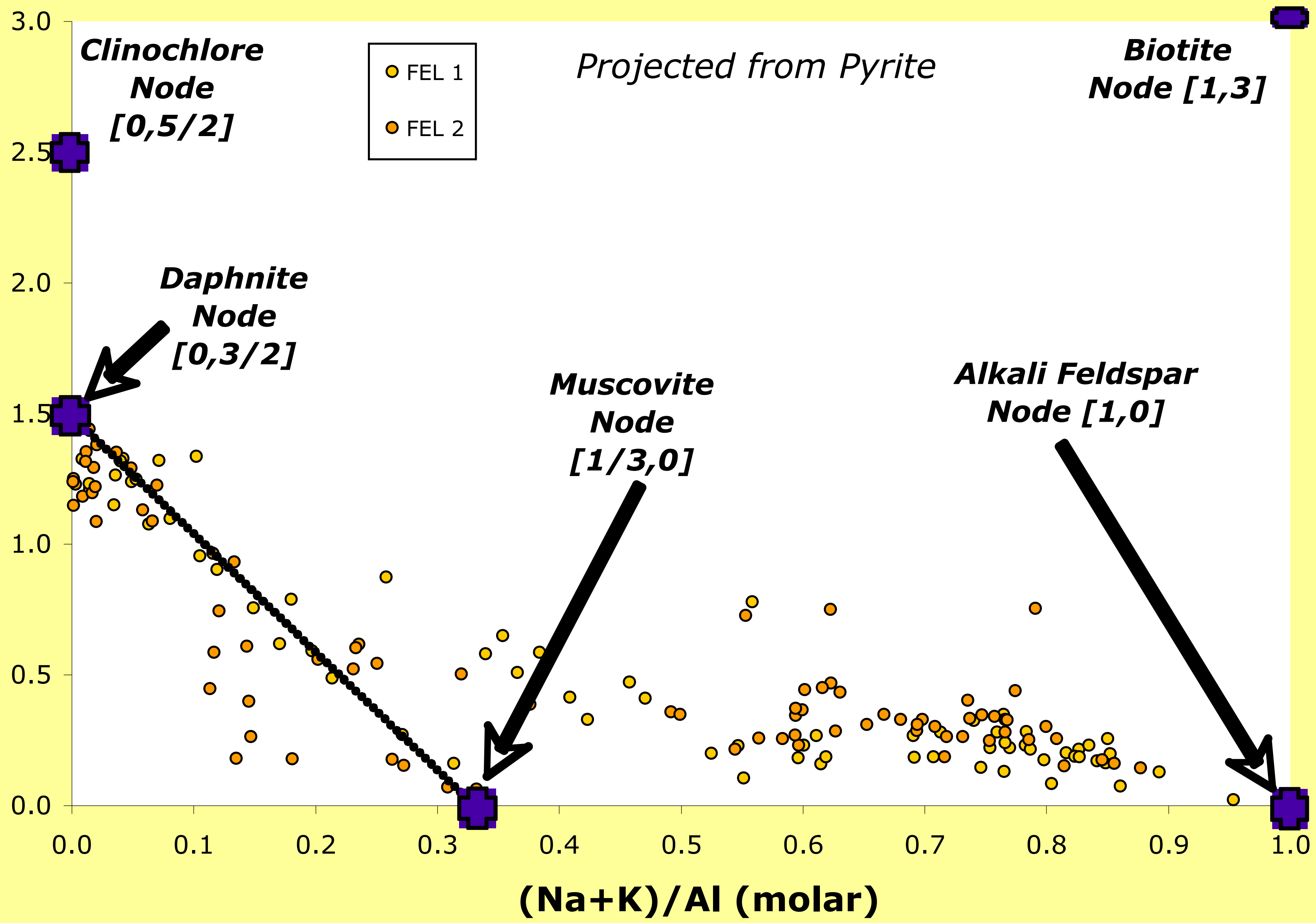
Molar Element Ratio Analysis



Molar Element Ratio Analysis



Molar Element Ratio Analysis



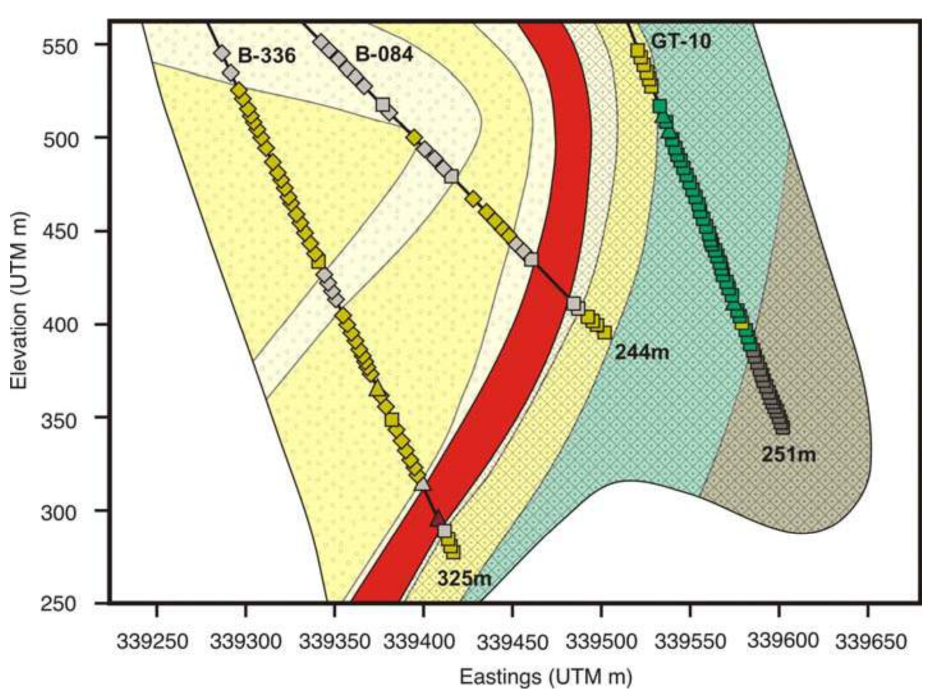
Hydrothermal Alteration

QTZ-MUSC: weak muscovite alteration of feldspar (hangingwall)

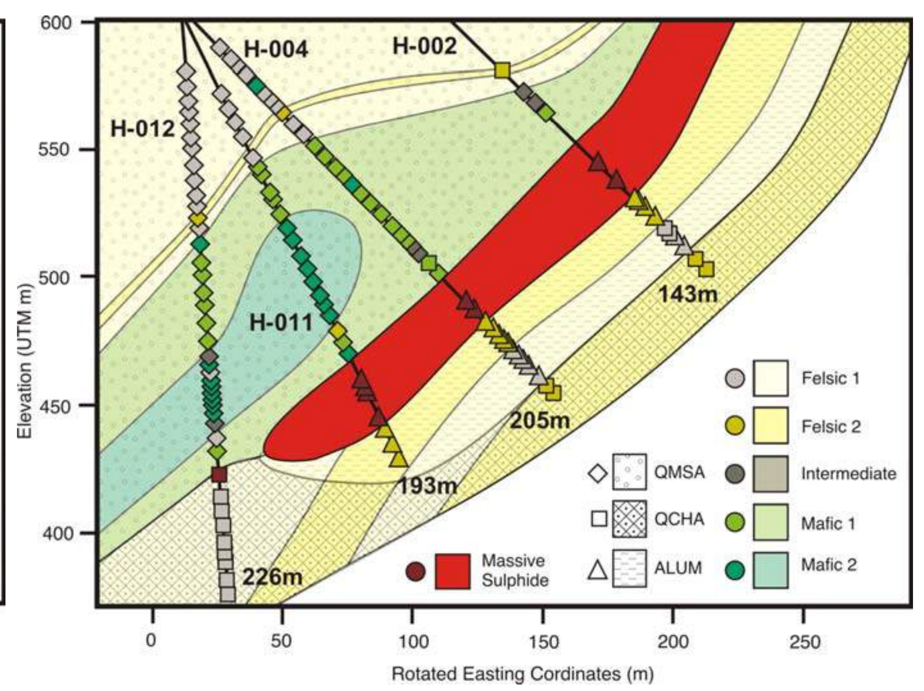
QTZ-CHL: intense chlorite alteration of muscovite (footwall)

ALUMINOUS: chlorite or chlorite-andalusite-muscovite-calcite assemblage (immediate footwall/gangue)

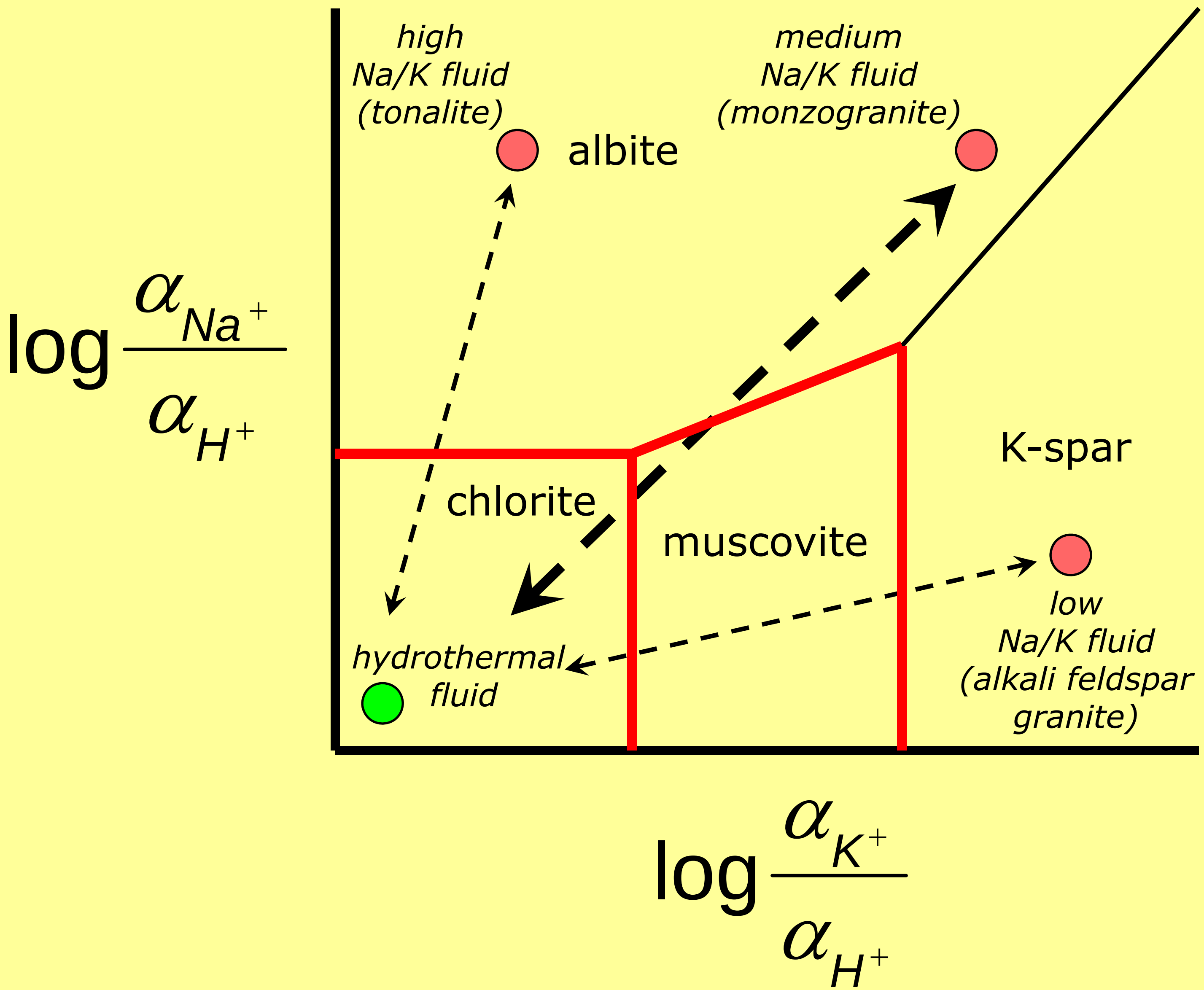
Bisha VHMS



Harena VHMS



K vs. Na Mineral Stability Diagram



Water-Rock Reactions

K-spar & Albite => Muscovite

3 K-Spar + 2 H^+ => Muscovite + 6 Quartz + 2 K^+

3 Albite + 2 H^+ + K^+ => Muscovite + 6 Quartz + 3 Na^+

Muscovite => Chlorite

2 Muscovite + 14 H_2O + 3 Fe^{+2} + 6 Mg^{+2}

=>

Daphnite/Sheridanite + Quartz + 2 K^+ + 16 H^+

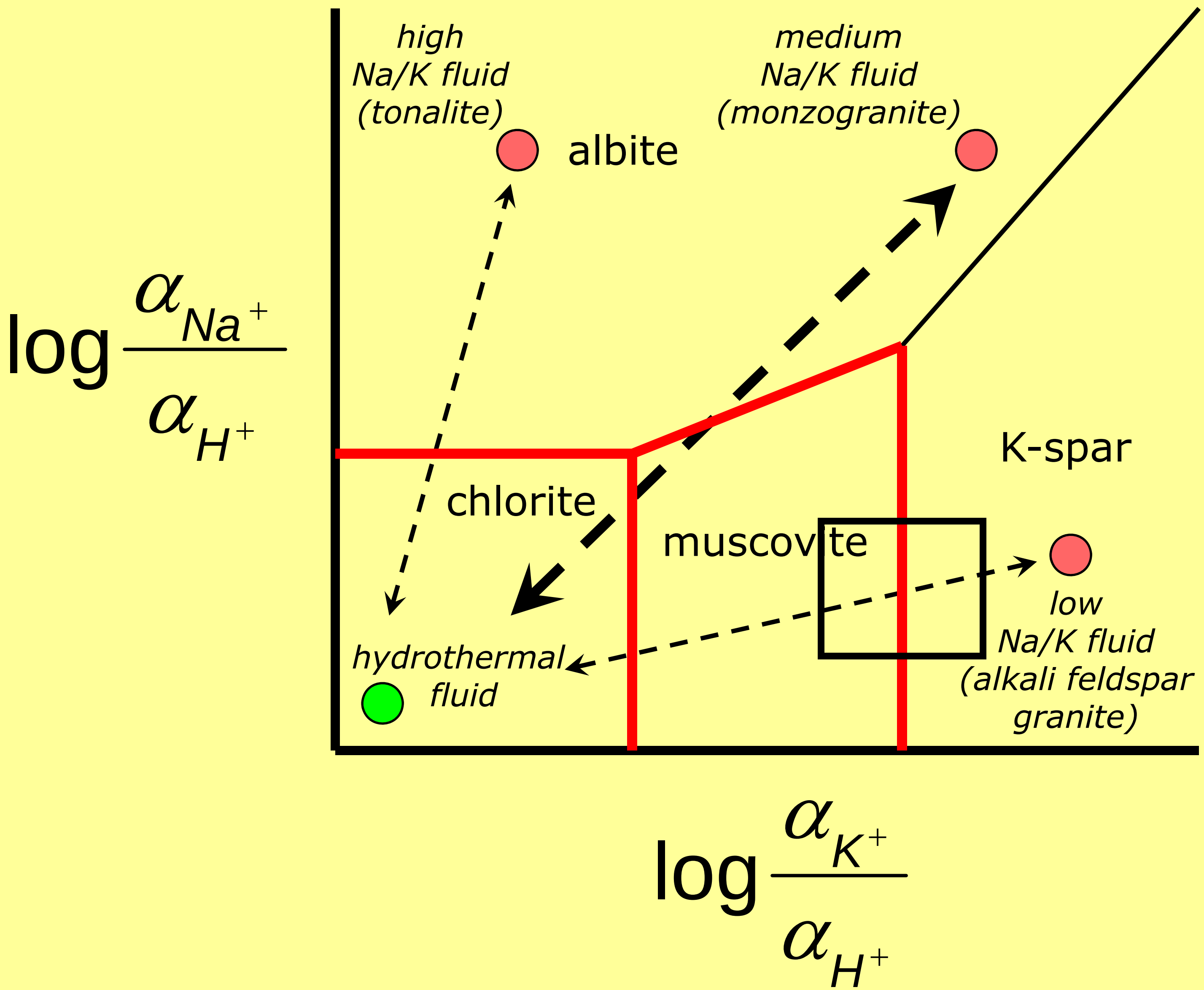
Albite => Chlorite

6 Albite + 14 H_2O + 3 Fe^{+2} + 6 Mg^{+2}

=>

Daphnite/Sheridanite + 13 Quartz + 6 Na^+ + 12 H^+

K vs. Na Mineral Stability Diagram



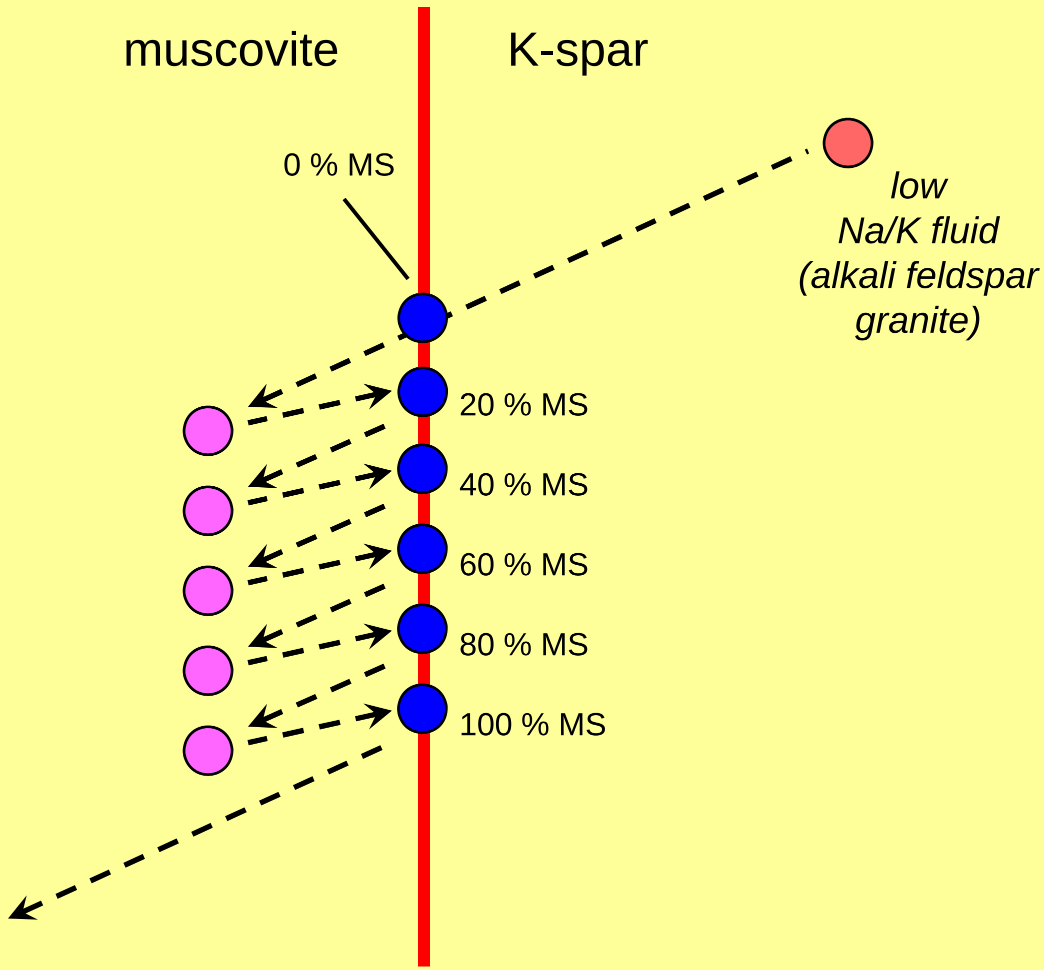
Hydrothermal Alteration Path

Introduction of hydrothermal fluid moves the mixed fluid composition into the muscovite stability field, causing the K-spar => muscovite reaction to occur:

$$3\ KAlSi_3O_8 + 2\ H^+$$
$$\Rightarrow$$
$$KAl_3Si_3O_{10}(OH)_2 + 6\ SiO_2 + 2\ K^+$$

This moves the mixed fluid composition back onto the K-spar-muscovite stability field boundary

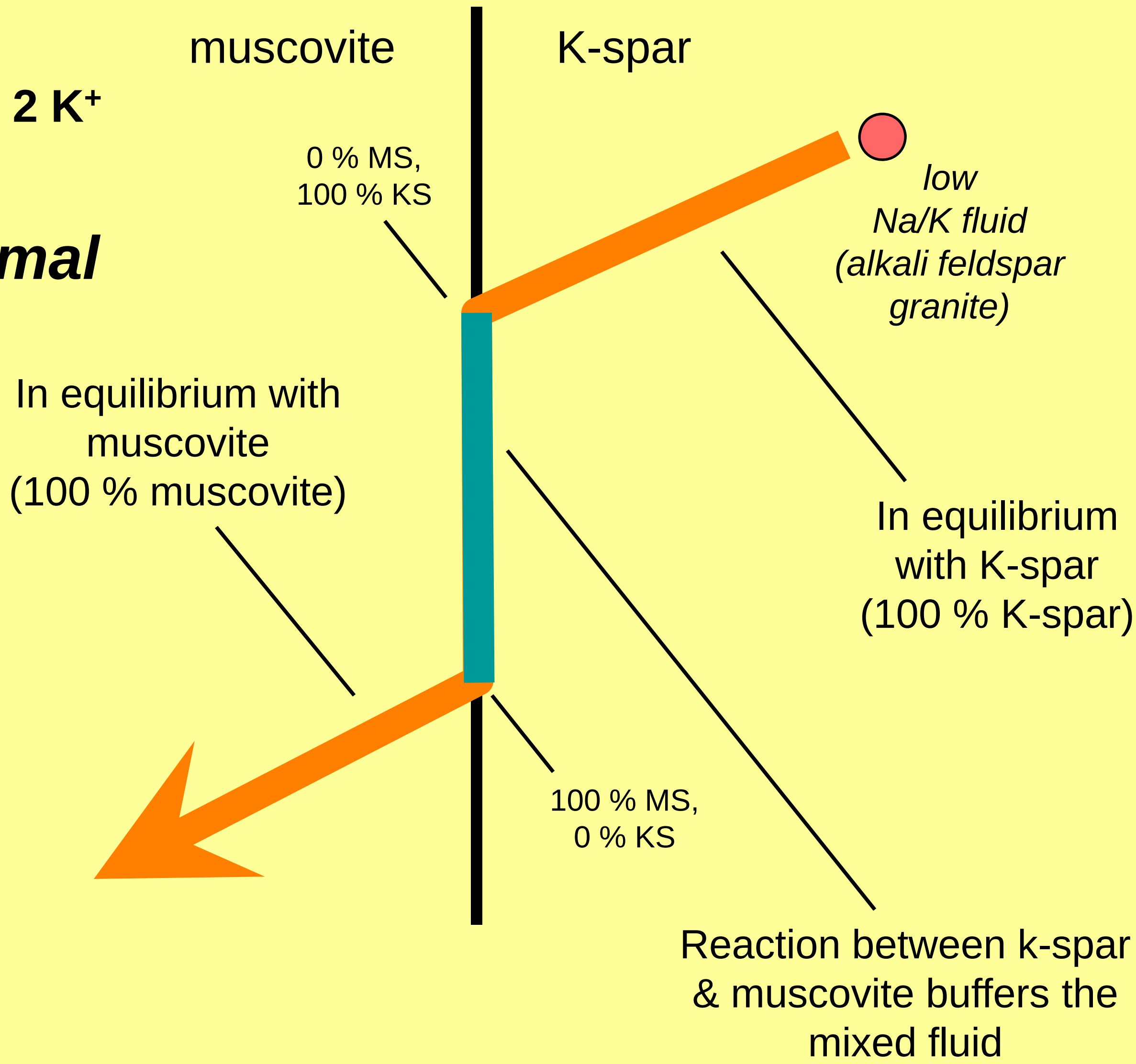
Repetition of this process moves the mixed fluid composition down the stability boundary until K-spar is consumed



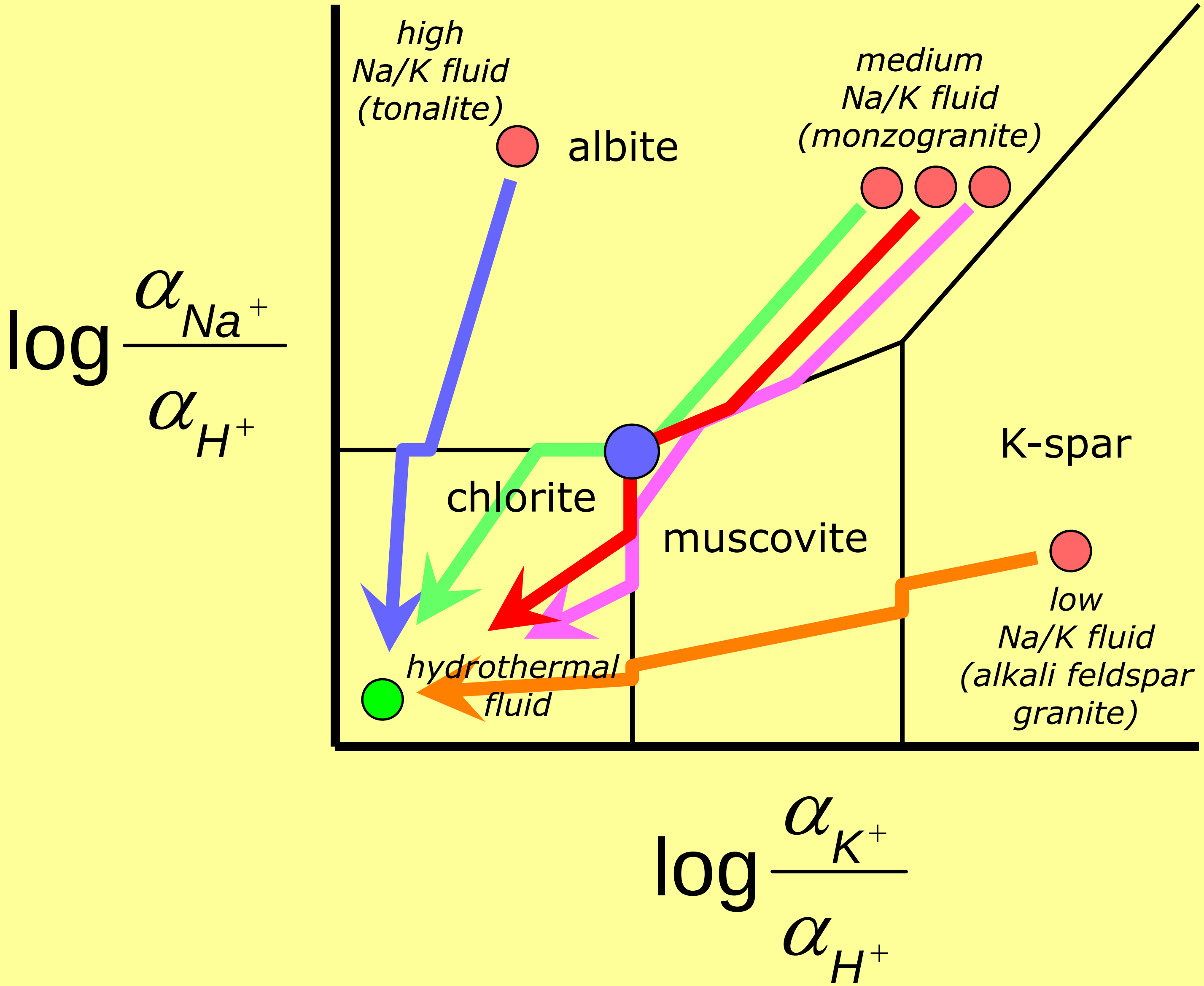
Hydrothermal Alteration Path

$$3\ KAlSi_3O_8 + 2\ H^+$$
$$=>$$
$$KAl_3Si_3O_{10}(OH)_2 + 6\ SiO_2 + 2\ K^+$$

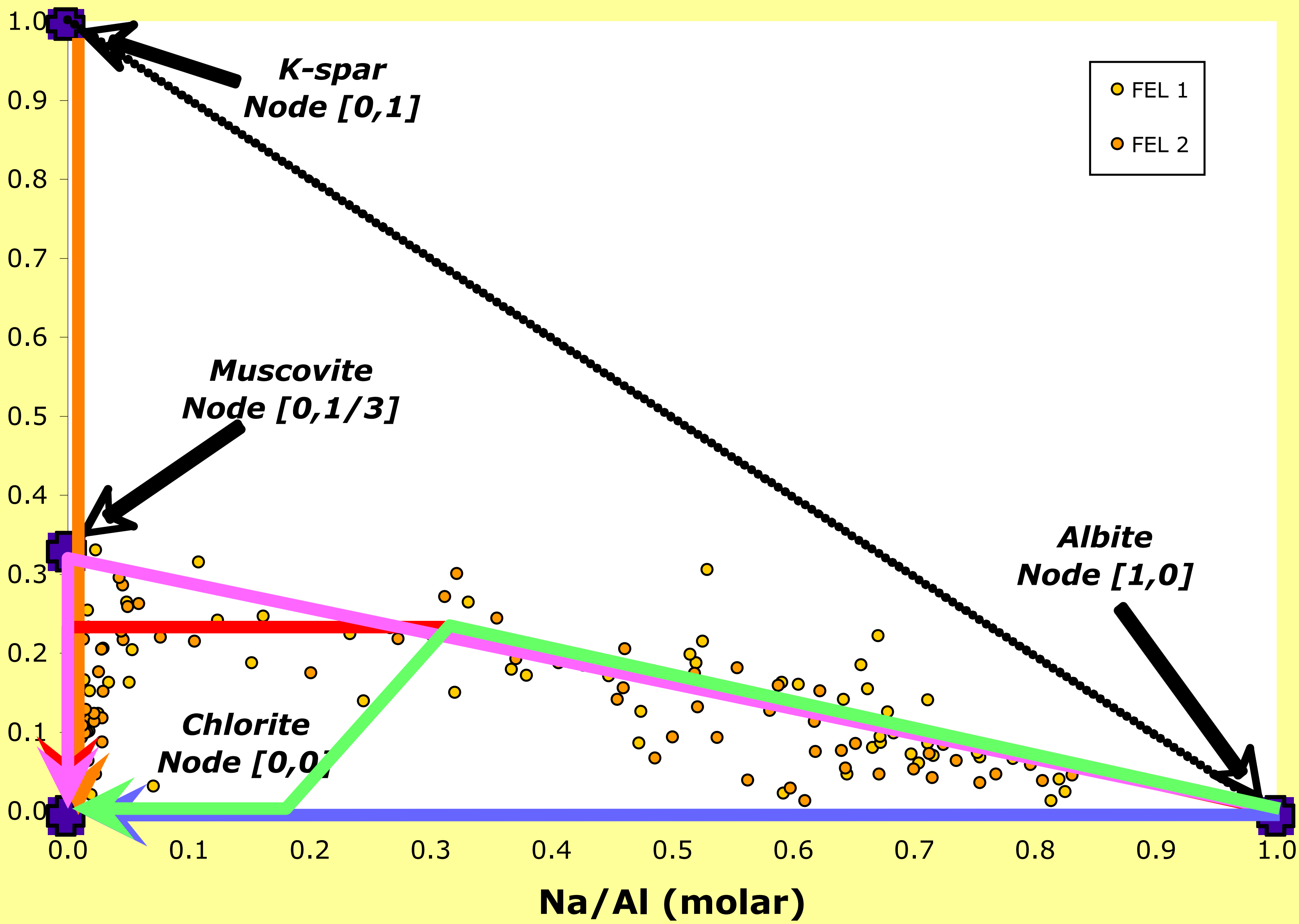
Buffered Hydrothermal Alteration Path



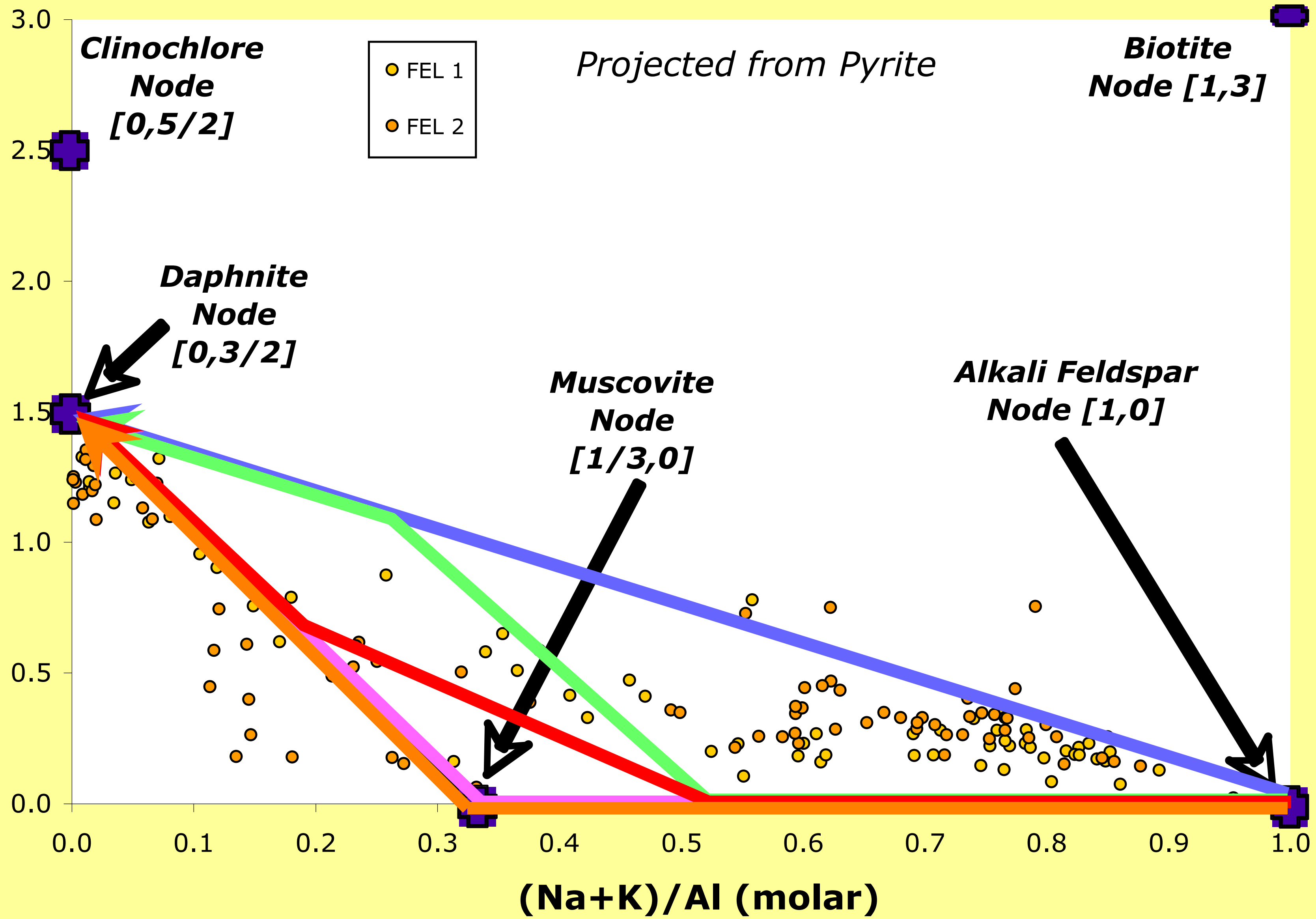
Mineral Stability Diagram



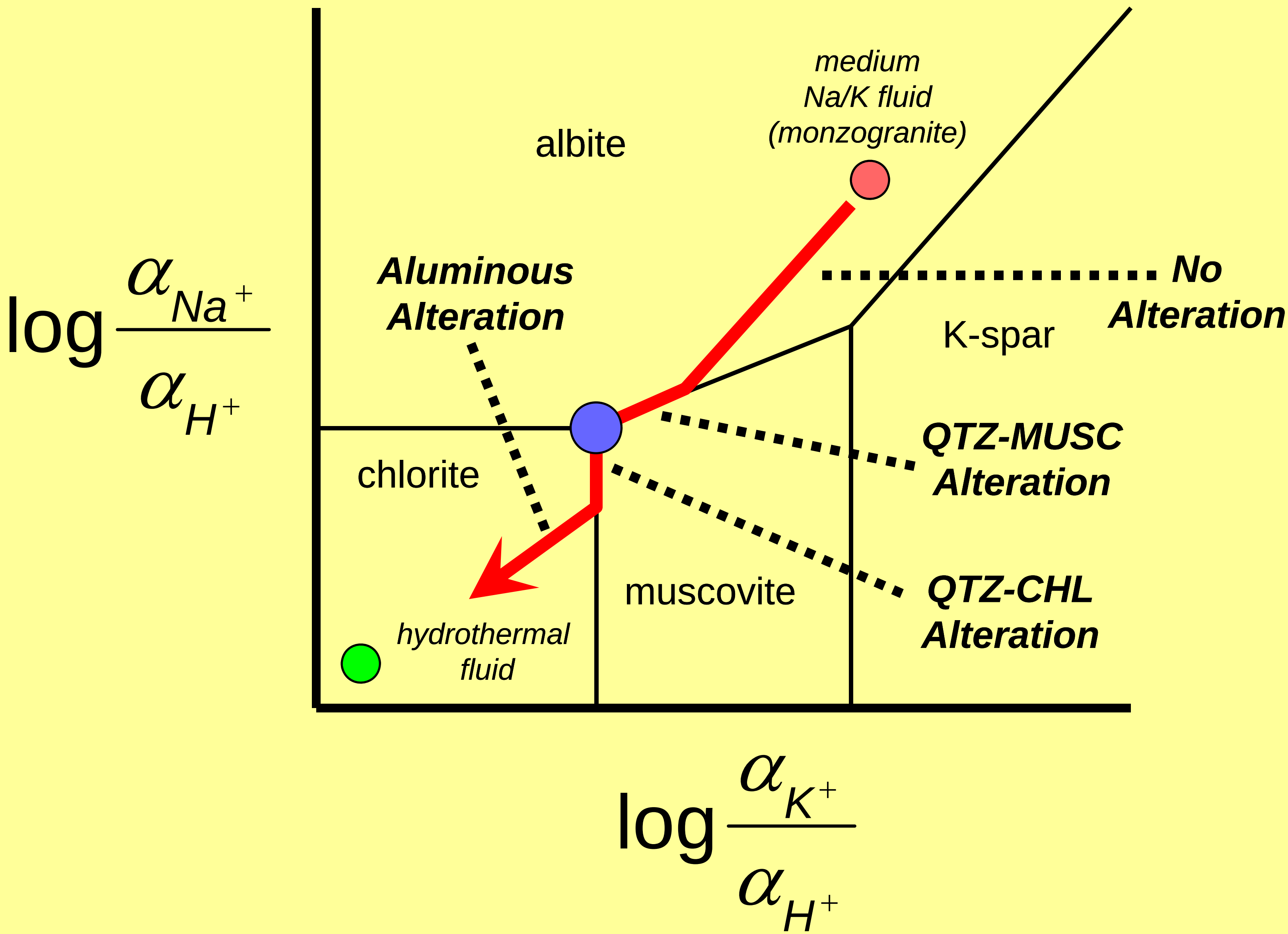
MER Analysis and HA Models



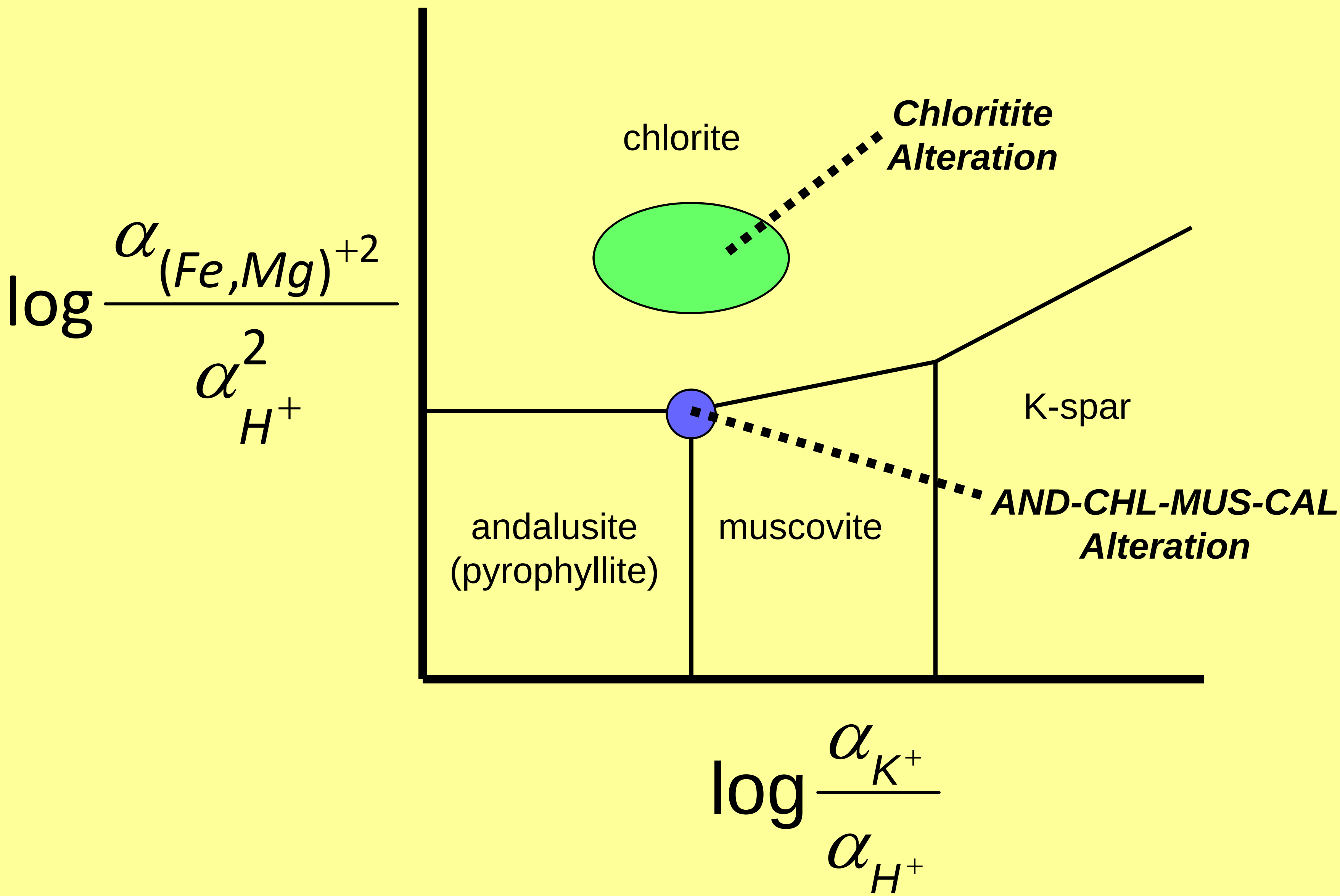
MER Analysis and HA Models



Mineral Stability Diagram



Mineral Stability Diagram



Conclusions

Two felsic, one intermediate, & two mafic volcanic rock compositions host the Bisha & Harena VHMS deposits

Bisha & Harena deposits do not occur at the same stratigraphic level

Three hydrothermal alteration styles exist:

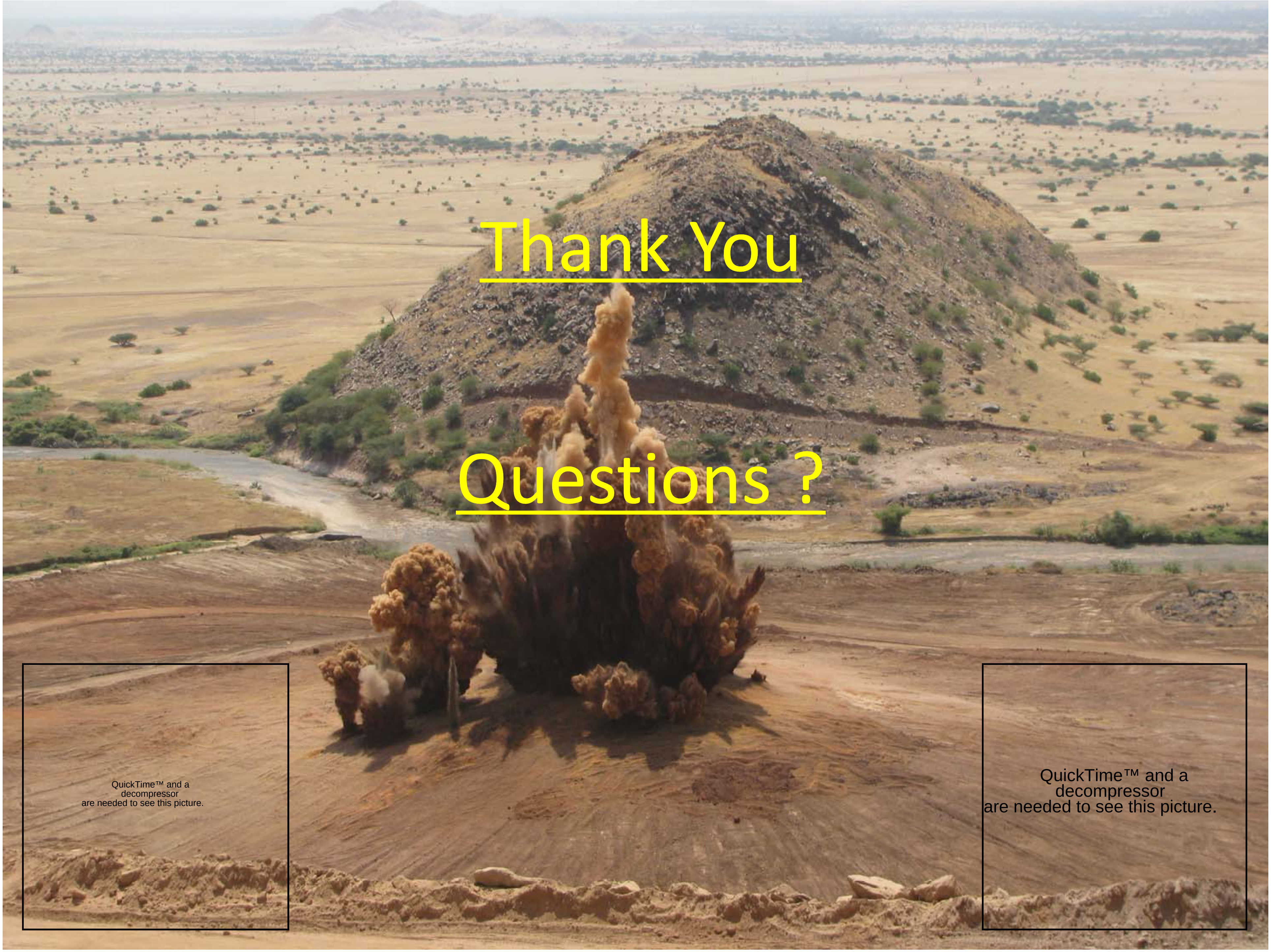
- **QTZ-MUS -** *hangingwall felsic & mafic rocks*
- **QTZ-CHL -** *footwall felsic, mafic, & intermediate rocks*
- **ALUMINOUS -** *immediate footwall (Harena felsic rocks)*

Aluminous alteration is previously un-recognized

These alteration styles exhibit similar (mmc) mineral assemblages with different proportions in different hosts

A simple thermodynamic model describes all 3 alteration styles

First illustration of invariant point control in VHMS alteration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Colluli: The Gateway to the Danakil

Asmara Mining Conference 2014

Paul Donaldson – CEO and Managing Director

Helping grow a better future

Forward Looking Statements and Disclaimer

The information in this presentation is published to inform you about South Boulder Mines (the "Company" or "STB") and its activities. STB has endeavoured to ensure that the information in this presentation is accurate at the time of release, and that it accurately reflects the Company's intentions. All statements in this presentation, other than statements of historical facts, that address future production, project development, reserve or resource potential, exploration drilling, exploitation activities, corporate transactions and events or developments that the 'Company expects to occur, are forward-looking statements. Although the Company believes the expectations expressed in such statements are based on reasonable assumptions, such statements are not guarantees of future performance and actual results or developments may differ materially from those in forward-looking statements.

Factors that could cause actual results to differ materially from those in forward-looking statements include market prices of potash and, exploitation and exploration successes, capital and operating costs, changes in project parameters as plans continue to be evaluated, continued availability of capital and financing and general economic, market or business conditions, as well as those factors disclosed in the Company's filed documents.

There can be no assurance that the development of the Colluli Project will proceed as planned. Accordingly, readers should not place undue reliance on forward looking information. Mineral Resources have been estimated using the Australian JORC (2004) Code ('JORC 2004'), which is a permitted code under Canadian National Instrument 43-101 ('NI 43-101'). In addition to the CIM Definition Standards on Mineral Resources and Mineral Reserves. Mineral Resource classifications under the two reporting codes are recognised as equivalent in categories with no material differences. To the extent permitted by law, the Company accepts no responsibility or liability for any losses or damages of any kind arising out of the use of any information contained in this presentation. Recipients should make their own enquiries in relation to any investment decisions.

Colluli highlights

1. Large, high grade potassium bearing resource close to surface in an emerging potash province.

2. Close proximity to coast and geographically favourable relative to key markets.

3. Unique combination of salts suitable for low cost production of potassium sulphate (SOP or sulphate of potash).

4. Strong and effective relationship with joint venture partners – ENAMCO

5. Project development based on modular concepts to build a platform for growth while focussing on risk mitigation and resource utilisation

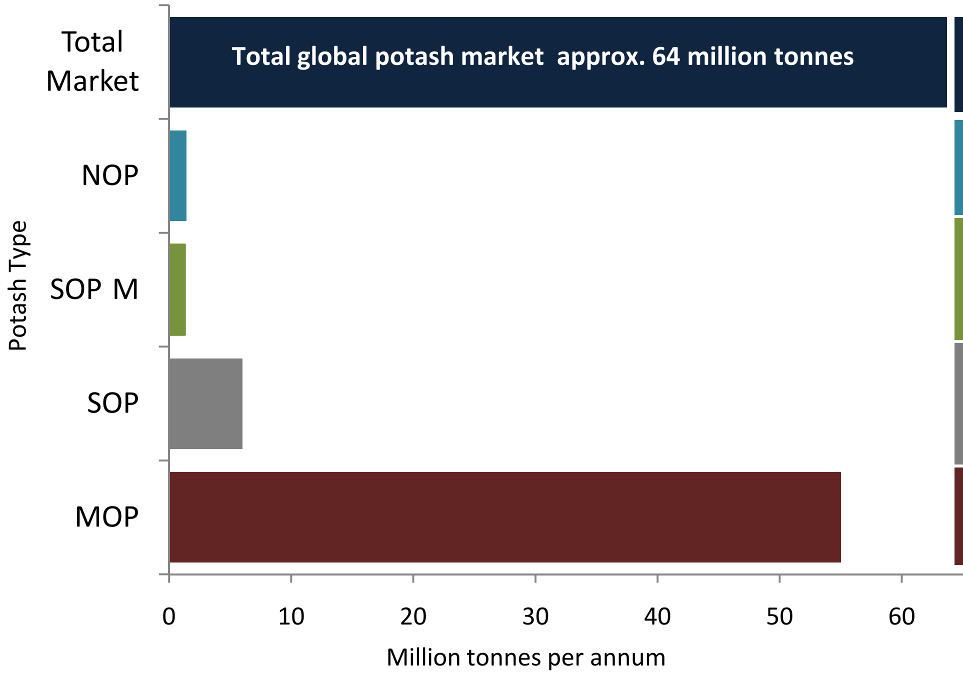
Potash and demand drivers

Potash is a generic term used to describe a variety of potassium bearing minerals and manufactured chemicals used primarily as fertiliser.

<u>Key drivers of growth</u>

1. Increasing global population: +80 million people annually
2. Decreasing arable land
3. Changing dietary preferences

Potash comes in a variety of forms



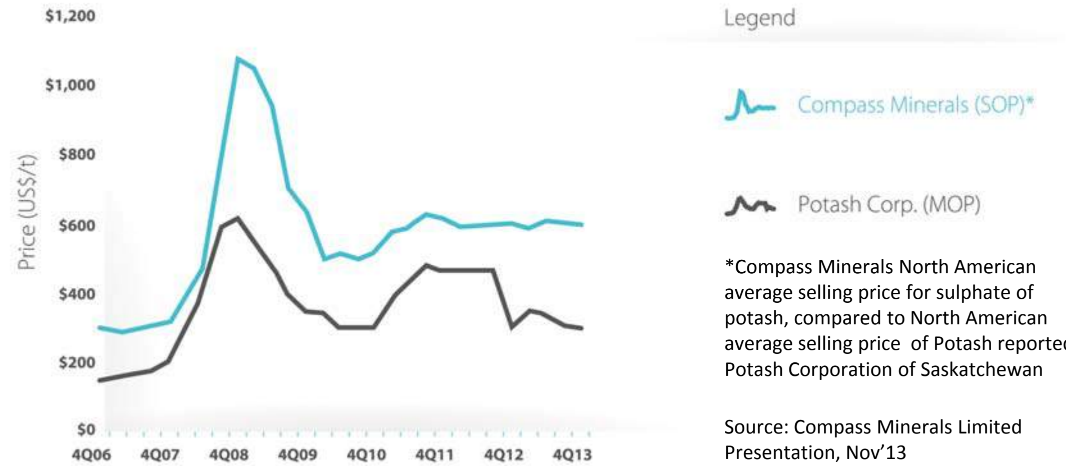
Potash Type	Nutrients	Uses
Potassium Nitrate	Potassium and nitrogen	Chloride sensitive crops that require additional nitrogen
Sulphate of Potash Magnesia	Potassium, sulphur and magnesium	Specialty fertiliser, high value crops, limited production centres
Sulphate of Potash	Potassium and sulphur	Chloride intolerant and specialty crops such as fruits, vegetables, nuts, beans and coffee
Potassium Chloride	Potassium	Staples – wheat, corn, chloride tolerant

Source: UN FAO, BMO Capital Markets

SOP – Price premium and limited advanced projects

Significant price premium over potassium chloride (MOP)

- Historical price premium has been in the order of 35%
- Current premium over 80%
- Suitable for high value crops
- Advantageous in saline and arid soils



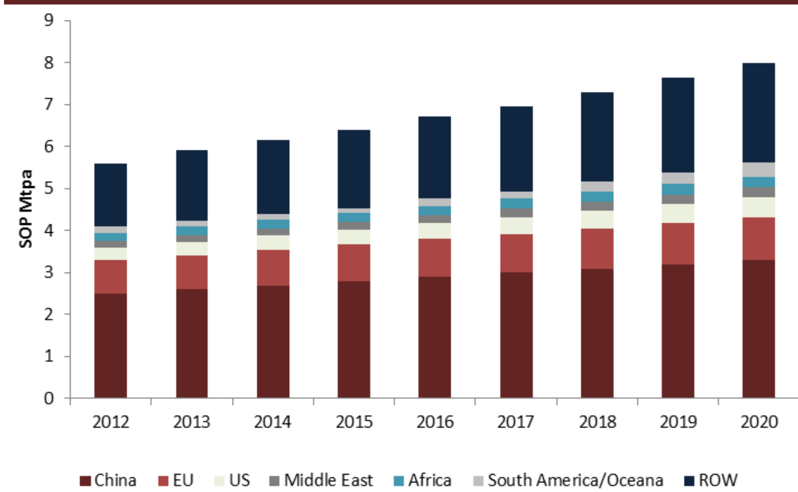
*Compass Minerals North American average selling price for sulphate of potash, compared to North American average selling price of Potash reported by Potash Corporation of Saskatchewan

Source: Compass Minerals Limited Presentation, Nov'13

Limited advanced new projects

- 4% CAGR projected
- Approximately 2 million tonnes of growth over the next 10 years
- Limited new projects
  - Greenfield SOP Projects at DFS = 1
  - Greenfield SOP Projects at PFS = 2

Significant price premium over potassium chloride



4% CAGR projected

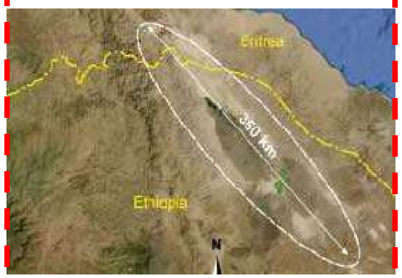
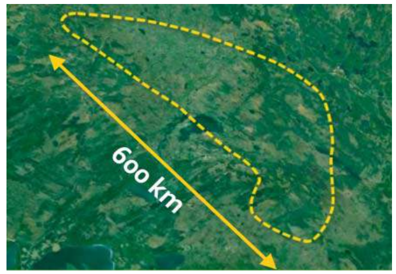
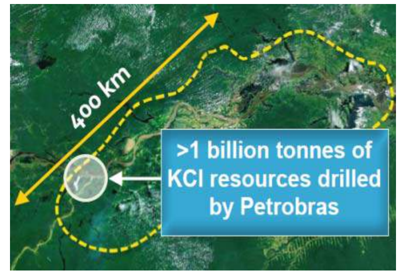
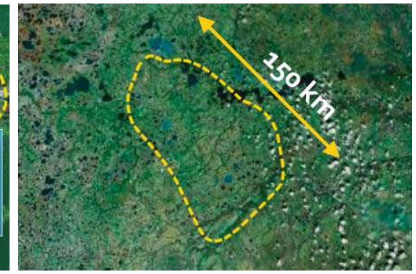
Source: Parthenon Analysis, EPM Mining

The Danakil Depression   an emerging potash province

The Danakil Potash belt compares favourably in terms of size, resource depth and environmental issues against other potash belts globally.

<u>> 4.2 billion tonnes of measured and indicated potassium salts across the Danakil to date</u>[1]

Key Global Potash Belts[2]

Attributes	Danakil, East Africa – Eritrea, Ethiopia	Saskatchewan, Canada	Manaus – Santarem Basin, Amazonas, Brazil	Urals, Russia
Size	 ▪ 350km across	 ▪ 600km across	 ▪ 400km across	 ▪ 150km across
Operator(s) Profile	▪ Emerging junior mining companies ▪ South Boulder, Allana, Circum ▪ Mineralised zones occur much closer to the surface ▪	▪ Established, large cap companies ▪ i.e. Canpotex	▪ Emerging mining companies ▪ i.e. Brazil Potash,	▪ Established, large cap companies ▪ K&S Group, Uralkali (Bela Russian)
Resource Depth	▪ Typically only 20 100m in Eritrea ▪ 150 – 950m in Ethiopia[3]	▪ Canadian deposits typically range from 1,500–2,000m	▪ Similar depth as Saskatchewan ▪ Typically ~500 2,000m[1]	▪ Russian depths are typically 1,800 to 2,000m
Climate	▪ Conducive to the use of Evaporation and geothermal power	▪ Cold climate ▪ Evaporative solar ponds less effective	▪ Wet climate, heavy rainfall ▪ Evaporative solar ponds less effective	▪ Cold climate ▪ Evaporative solar ponds less effective
Environment / Social	▪ Flat, arid desert with sparse population ▪ Minimal community/social concerns	▪ Heavily populated area ▪ Significant community/social concerns	▪ Tropical climate, dense vegetation ▪ Considerable environmental issues	▪ Mountainous terrain ▪ Low environmental concerns

Notes:

1. Measured and Indicated tonnages for Danakil based on combined tonnages from South Boulder Mines, Allana Potash and Ethiopian Potash (Agriminco) South Boulder Mines tonnages from stated N43 101/JORC resource, Allana tonnages from Allana Feasibility N43 101 compliant project summary, Ethiopian Potash (subsequently Agriminco) tonnages obtained from SEDAC, N43 101 resource report
2. Based on Brazil Potash presentation (February 2013).
3. Ethiopia drill depths obtained from Allana reports

Large, high grade potassium bearing resource

Over 1 billion tonnes of potassium bearing salts – all potassium salts in the Colluli resource are suitable for the production of potash fertilisers.

Shallow mineralisation supports Colluli as open pit – a proven, safer mining method, easier to expand and better overall resource recovery than underground.

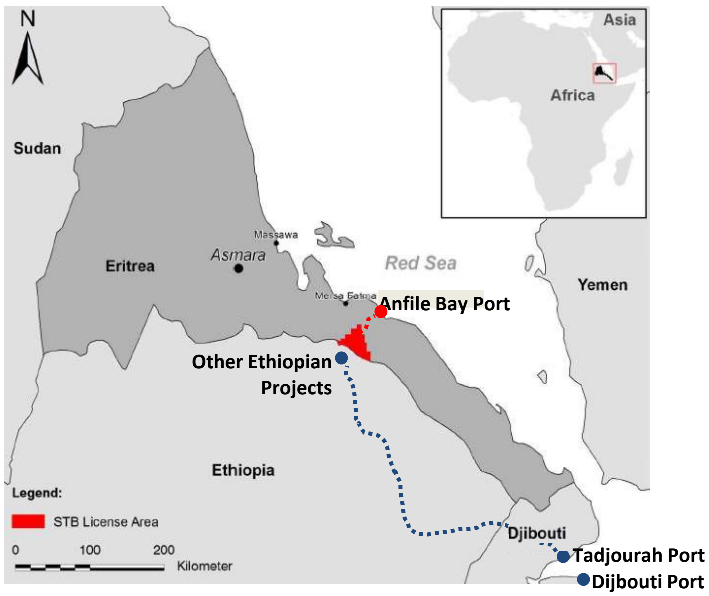
One of only three major resources containing kainite salt (key salt for SOP production) in solid form globally.

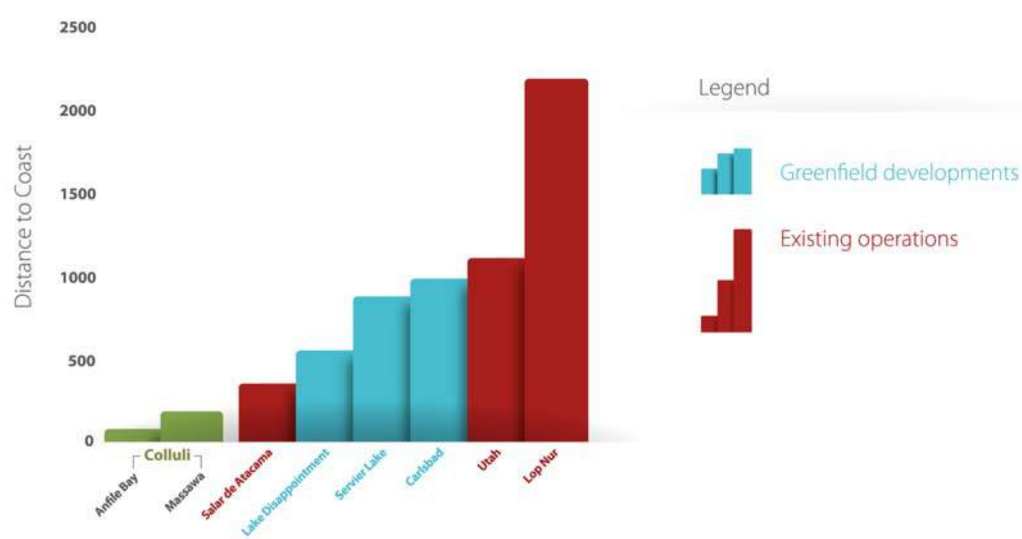
Colluli at a Glance	
Location	South Eritrea
Size	Approximately 400km^2
Product	Sulphate of Potash
Resource[1]	Measured: 262Mt Indicated: 581Mt Inferred: 173Mt *Total: 1016Mt*
Potassium Bearing Salts	Sylvinite: 110Mt Carnallitite: 309Mt Kainitite: 597Mt
Process	Flotation/Solar Evaporation
Stage	PFS level testwork program underway

[1] Refer to Resource Statement on Page 30

Close and unmatched proximity to the coast

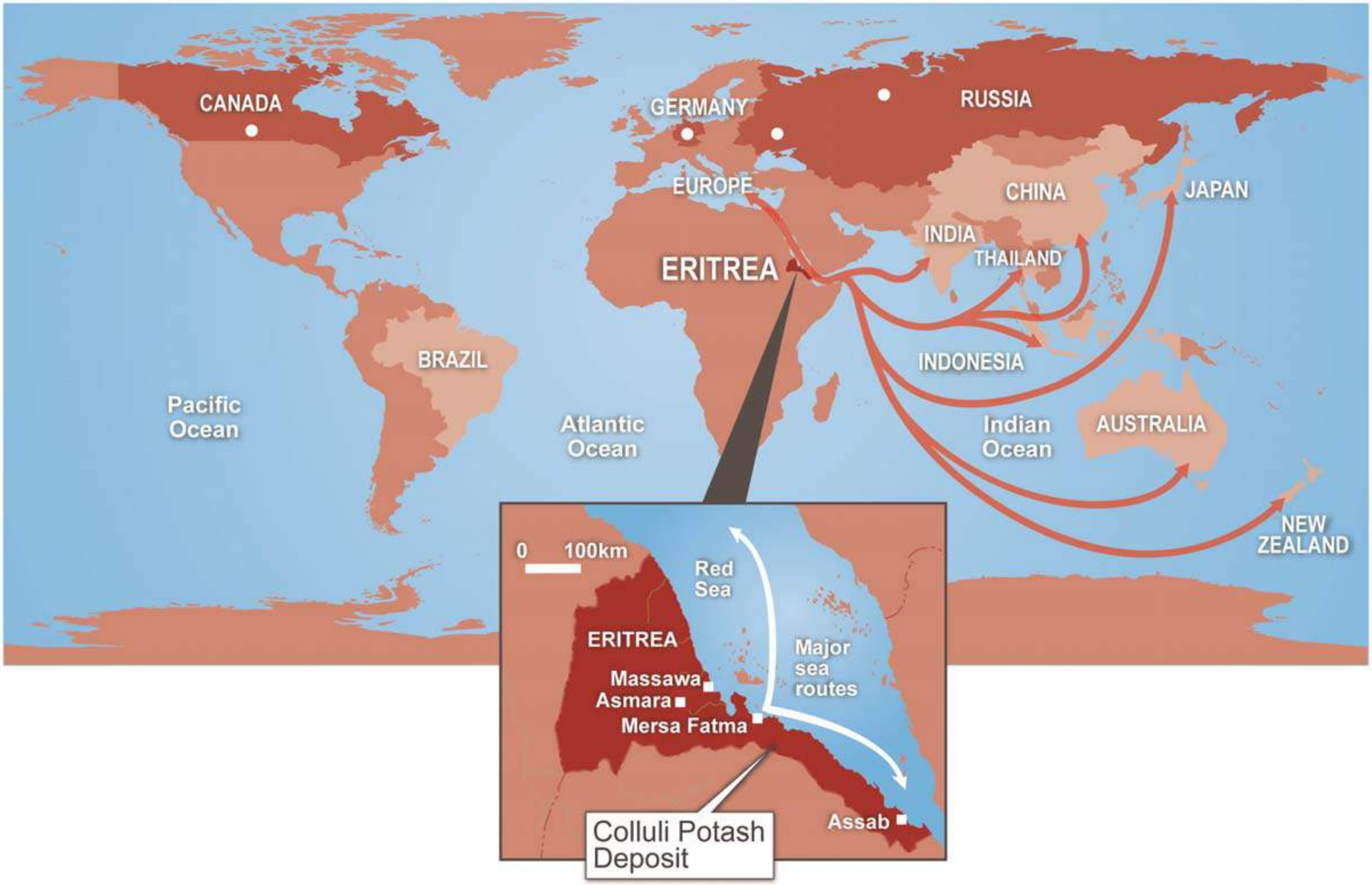
Colluli is the closest potassium sulphate resource to the coast globally and has the most favourable coastal access from the Danakil depression.





- 75km to designated loading point at Anfile Bay
- 180km from the Port of Massawa (4 berth bulk and container terminal)

Well located to key growth markets



Colluli's switch from MOP to SOP strong economic uplift

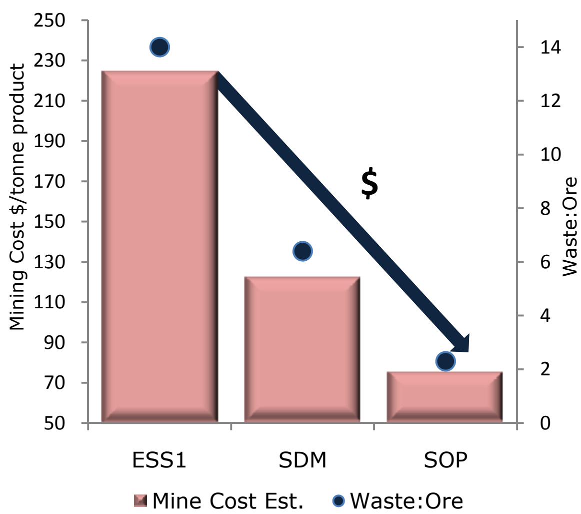
- Switching from MOP to SOP better matches resource, process and product

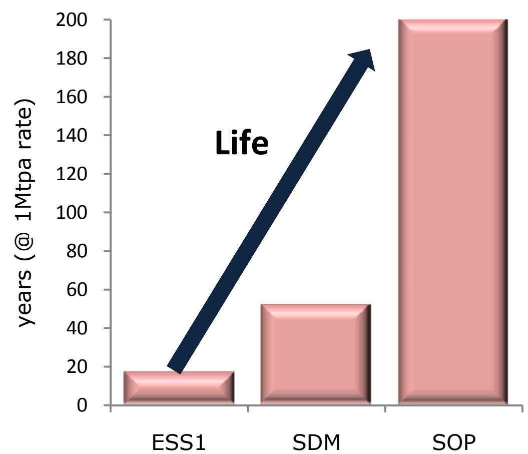
• Lower strip ratio	14:1 to 2.3:1	✓
• Lower mine cost	$224 to $75/tonne of product	✓
• Potentially longer mine life	17yrs to 200yrs	✓
• Substantial price premium	+$US300 price premium over MOP	✓

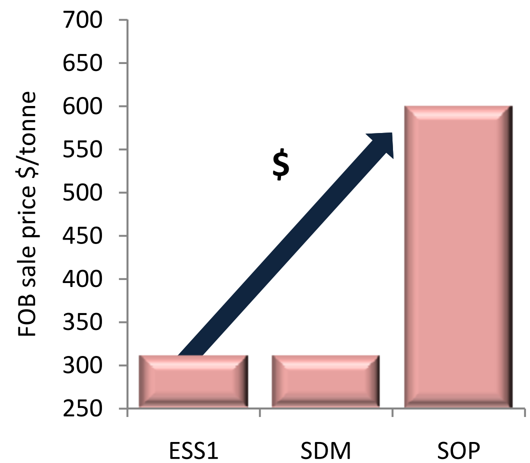
Reduction in strip ratio and mining costs

Substantial potential increase in mine life

Substantial Premium based on current and historical product prices







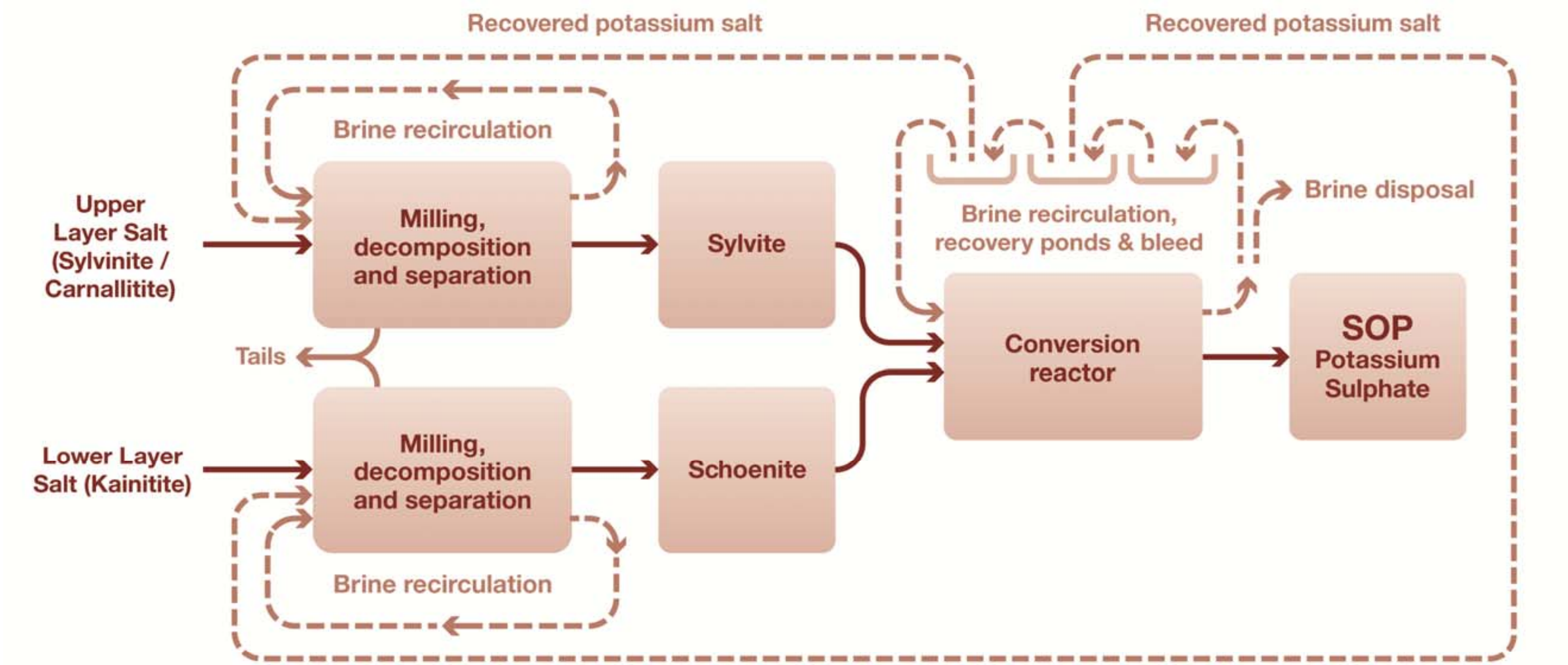
Source: 6th February 2014, South Boulder Mines ASX release, 'Positive Results from Colluli Processing Review'
21st March 2013, Colluli Potash Project, Updated Economics
ESS1 = Engineering Scoping Study, 1 million tpa potassium chloride
SDM = Staged Development Model

Production process is simple and proven

1. Colluli's key salts can be purified using simple liberation and conventional flotation processes.
2. The combination of the purified salts results in an ambient temperature, high yield conversion directly to potassium sulphate.
3. This simple, proven process is currently used by low cost brine producers.
4. The key difference is that Colluli starts with salts rather than brine. This is a major advantage of the Colluli resource. It reduces footprint size, improves reliability of productivity, and reduces complexities of brine chemistry management.
5. The presence of kainite and sylvite (from sylvinite and carnallite) give the Colluli a major advantage for SOP production. It is the combination of these salts that minimise energy inputs and result in maximum potassium yield.

Preliminary process concept

Potassium chloride produced is combined with kainite to produce SOP

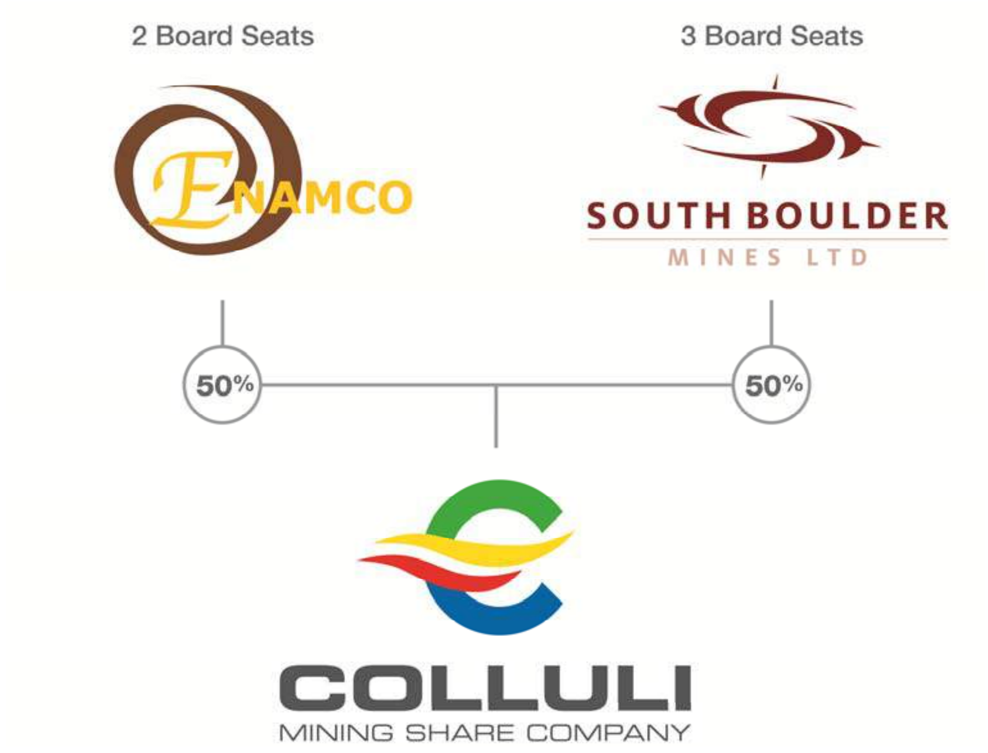


This is the lowest energy input, highest potassium yield route to potassium sulphate

Other key factors for Colluli

1. No communities within the exploration tenements.
2. Process can accommodate seawater – consistent and unlimited water supply to be piped from the Red Sea coast to the Colluli site. No major abstraction from local aquifer.
3. Unsealed coastal road runs within 60km of the Colluli site.
4. No clearing required.
5. Ease of access for construction equipment and mining fleet.

Colluli Mining Share Company (CMSC) incorporated



Colluli Mining Share Company was incorporated in March 2014.

1. **3 board meetings held to date**
2. **Financials approval process for CMSC established**
3. **Board overseeing and governing the Colluli development**

Adopting the principles of modularity

Colluli has changed the development philosophy from large scale development to one where modularity and expandability are key themes.

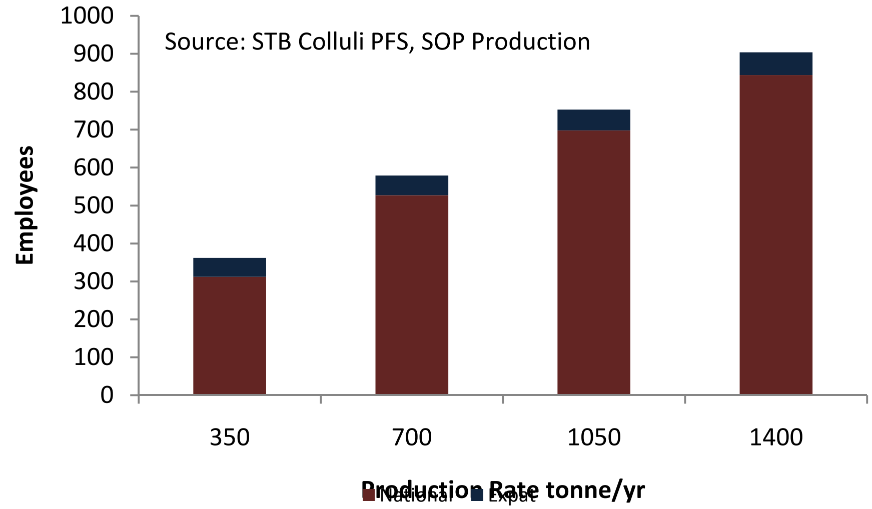
Why Modularity?

1. **Risk Mitigation: Safety, Capital/Commercial**
2. **Process Optimisation**
3. **Capital Management**
4. **Ease of Expandability**

Risk mitigation

Safety:

- Managing workforce size, skills and training
- Avoiding competition for limited skills within developing mining industry
- Developing capability at a manageable rate



Capital/Commercial:

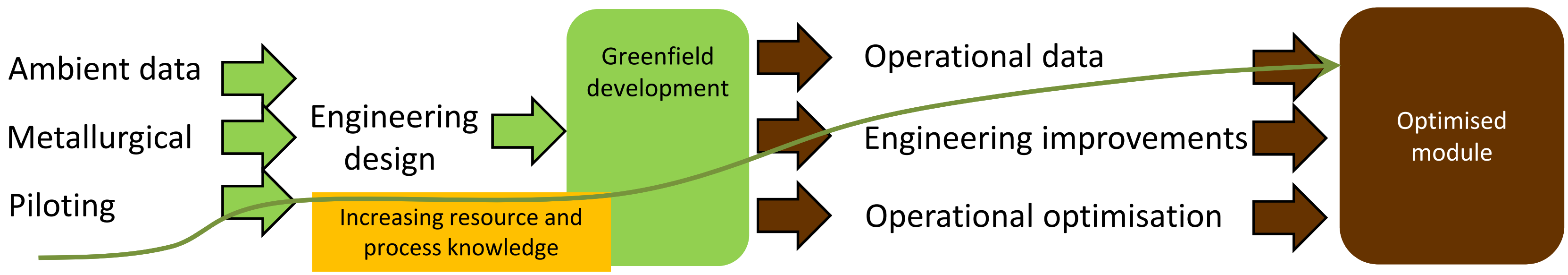
- Analysis of Australian mining projects shows larger % cost increases with increasing project size
- Highest level of confidence in the bracket with the largest number of projects ($100m $500m)

Value of Mining Projects Completed ($m)	20 – 100	101 500	501 1000	+1000
Number completed	43	54	17	27
Average cost change	2.4%	3.8%	4.0%	14.6%

Source: Deloitte Access Economics, March 2014

Process and resource optimisation

Process Optimisation

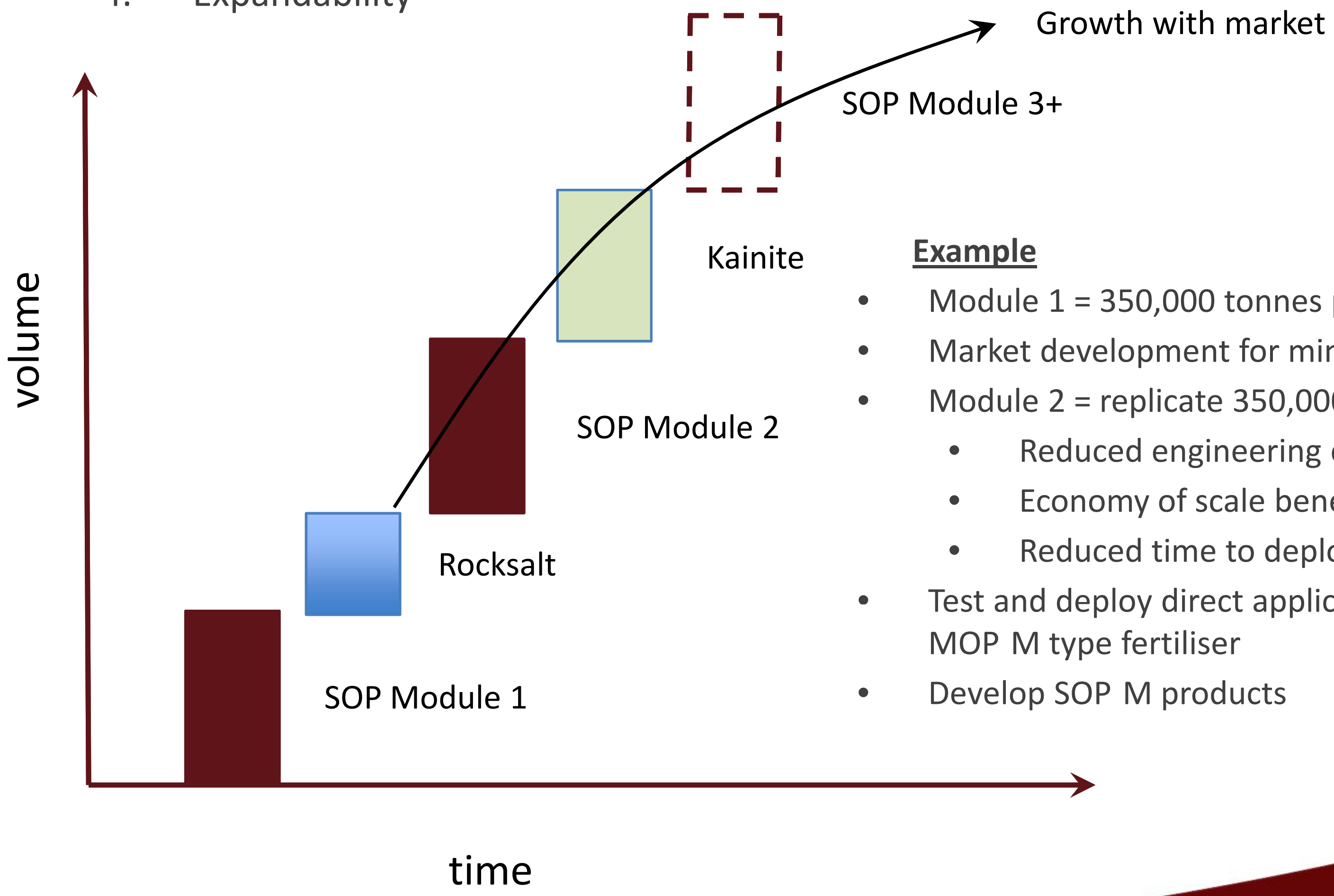


- Greenfield developments rely on data acquisition and metallurgical test programs for process design. While this proves and derisks the process, operational data and process understanding are core elements of process optimisation.

- Module designs can be optimised with the combination of data, plant performance, improved understanding of raw material and processing behaviour.

The advantages of modularity

1. De risking the project
2. Resource utilisation – introducing other value accretive products
3. Market penetration
4. Expandability



Example

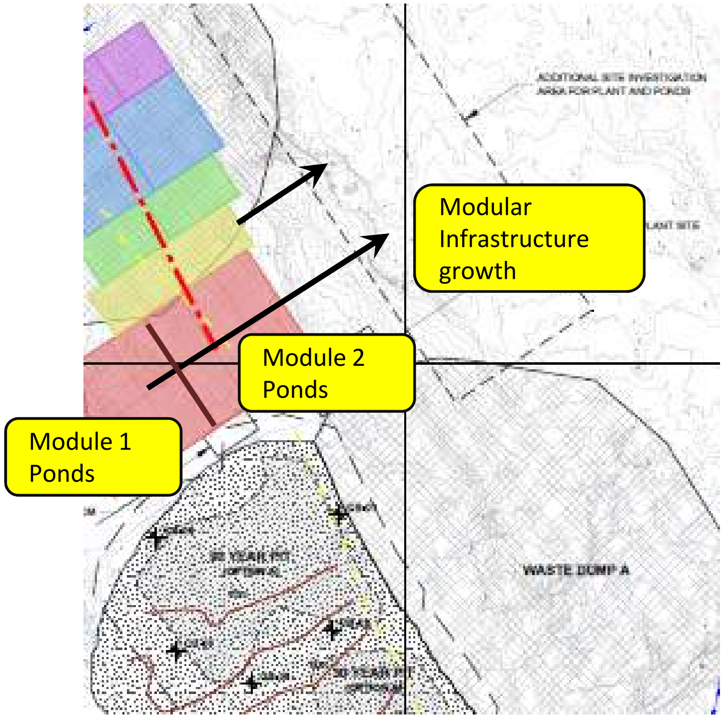
- Module 1 = 350,000 tonnes product
- Market development for mined rocksalt
- Module 2 = replicate 350,000 tonne module
  - Reduced engineering costs
  - Economy of scale benefits
  - Reduced time to deploy
- Test and deploy direct application kainite as MOP M type fertiliser
- Develop SOP M products

Colluli's infrastructure solution based on modularity

Modular Servicing Bays (example)

Modular Fuel Pods (example)

Modular Offices and Camp (example)



- Simpler logistics
- Reduced Earthworks
- Ease of expandability
- Improved capital management
- Improved process ramp up

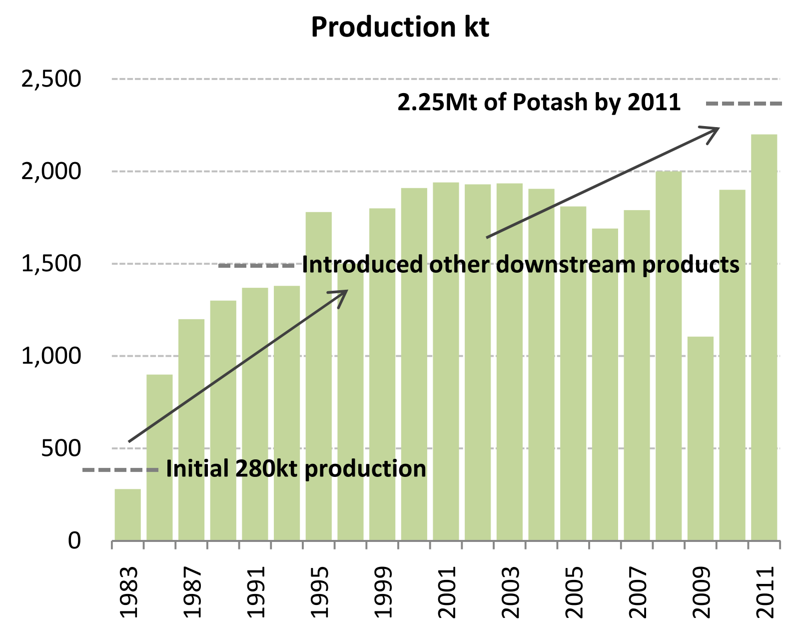
Case study: Modular expansion at the Dead Sea

A modular expansion path was used at Arab Potash Company's (APC) Dead Sea operations. This laid the foundation for ongoing growth.

Modular Expansion Case Study: APC

- Produce in the Dead Sea
- Modular expansion a success
  - Began in 1983 with 280kt potash production
  - Introduced downstream industries such as salt, NPK, Magnesia, Bromine & Potassium Nitrate
  - By 2011 producing 2.25Mt of potash
- This supports STB's planned 'first generation', 'second generation' and 'long term' expansion stages

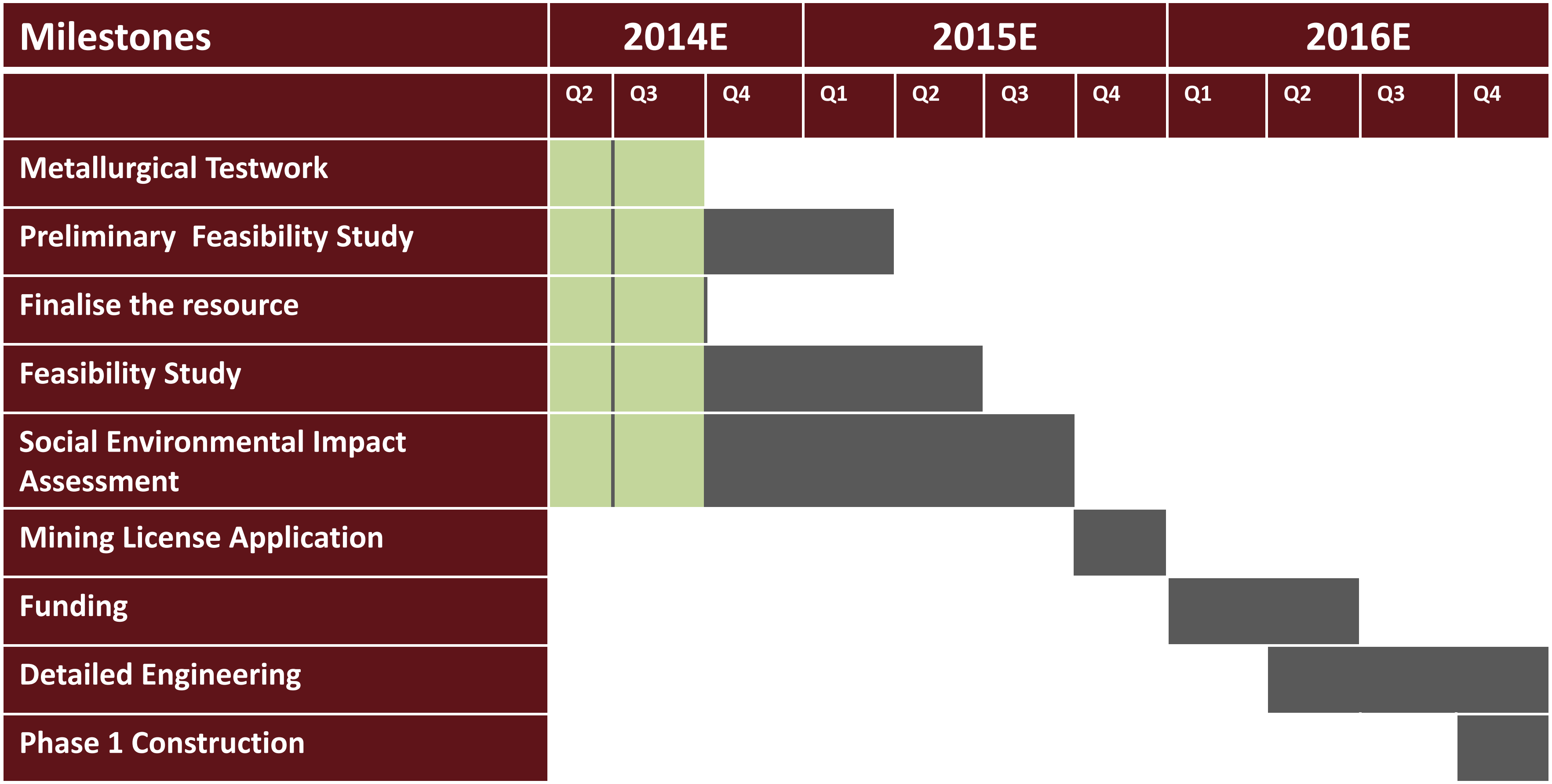
Modular Production Profile



2014 Accomplishments

Options review to process all salts completed	Feb
CMSC incorporated	Mar
Initiated transfer of resource model to AMC consultants	Mar
Commencement of metallurgical testwork for SOP production	Apr
Appointed study manager	May
Established all project workstreams for feasibility studies	May
Anfile Bay allocated to the project as export location	Jun
Oceanography studies initiated	Jul
Preliminary process design flowsheets developed	Aug
First tranche of environmental baselines submitted	Aug
Resource hole ‘twinning’ and geotech drilling initiated	Sep

PFS well progressed



Colluli summary

1. Large, high grade potassium bearing resource close to surface in an emerging potash province.

2. Close proximity to coast and geographically favourable relative to key markets.

3. Unique combination of salts suitable for low cost production of potassium sulphate (SOP or sulphate of potash).

4. Strong and effective relationship with joint venture partners – ENAMCO

5. Project development based on modular concepts to build a platform for growth while focussing on risk mitigation and resource utilisation

SOUTH BOULDER
MINES LTD

Thank you

Appendix

Highly capable team working through SOP PFS

Colluli Study Manager : James Durrant

Commencement Date : May 2014

AMC Consultants	Resource Mine planning Mine geotech	Lycopodium	Infrastructure and process design (with Global Potash Solutions)
Knight Piésold Consulting	Hydrogeology, ponds and infrastructure geotech	SRC Saskatchewan Research Council	Metallurgical Testing
PRDW Consulting Port and Coastal Engineers	Export logistics	MBS Environmental	Social and Environmental Impact Assessment

Potential market opportunities

Markets for these products are well established.

Potential Markets for Various Resource Mineralisation

Mineral Present at Colluli	Colluli Resource[1]	Global Market Context
rock salt (NaCl) halite (NaCl)	+ 650Mt	300Mtpa global salt market
bischofite ($MgCl_2$)	+200Mt	6 – 7Mtpa global market
anhydrite	Avg 4% (~40Mt)	187Mtpa Gypsum market
kieserite ($MgSO_4$)	40Mt	Established fertiliser segment

[1] Refer to Resource Statement on Page 30

Resource statement

The Current Colluli JORC-Compliant Mineral Resource Estimate by potash mineral is as follows:

Occurrence	Tonnes (Mt)	Equivalent KCl	Contained KCl (Mt)	% of Total Resource
Sylvinite (KCl.NaCl)	110	28.4%	31	16%
Polysulphate (K_2SO_4.NaCl.$MgSO_4$.H_2O)	65	10.8%	7	4%
Carnallite (KCl.$MgCl_2$.H_2O)	309	12.3%	38	19%
Kainite (KCl.$MgSO_4$.3H_2O)	596	19.8%	118	61%
Total	1,080	18.0%	194	100%

The Colluli Potash Project has a current JORC/NI43-101 Compliant Measured, Indicated and Inferred Mineral Resource Estimate of 1,079.00Mt @ 17.97% KCl or 11.35% K2O (total contained potash of 194.09Mt KCl or 122.61Mt K2O). The resource contains 261.81Mt @ 17.94% KCl or 11.33% K2O of Measured Resources, 674.48Mt @ 17.98% KCl or 11.36% K2O of Indicated Resources and 143.50Mt @ 18.00% KCl or 11.37% K2O of Inferred Resources.

This information was prepared and first disclosed under the JORC Code 2004. It has not been updated since to comply with the JORC Code 2012 on the basis that the information has not materially changed since it was last reported by independent consultants ERCOSPLAN and announced by South Boulder on 16 April 2012.

Competent Persons and Responsibility Statement

The information in this report that relates to Exploration Results and Mineral Resources is based on information compiled by Greg Knox using estimates supplied by South Boulder Mines Ltd under supervision by Ercosplan. Dr Henry Rauche and Dr Sebastiaan Van Der Klauw are co-authors of the JORC and NI43-101 compliant resource report. Greg Knox is a member in good standing of the Australian Institute of Mining and Metallurgy and Dr.s' Rauche and Van Der Klauw are members in good standing of the European Federation of Geologists (EurGeol) which is a “Recognised Overseas Professional Organisation” (ROPO). A ROPO is an accredited organisation to which Competent Persons must belong for the purpose of preparing reports on Exploration Results, Mineral Resources and Ore Reserves for submission to the ASX.

Mr Knox, Dr Rauche and Dr Van Der Klauw are geologists and they have sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which they have undertaken to qualify as a Competent Person as defined in the 2004 Edition of the “Australian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves”. Mr Knox, Dr Rauche and Dr Van Der Klauw consent to the inclusion in the report of the matters based on information in the form and context in which it appears.

Experienced board and management

Paul Donaldson, CEO and Managing Director

Mr Donaldson was appointed to the role of Chief Executive Officer in February 2013. He joins South Boulder Mines from a series of senior management roles with BHP Billiton. Mr Donaldson has experience in large scale open cut mine management, supply chain logistics, mineral processing, business improvement and marketing.

Seamus Cornelius, Non Executive Chairman

Mr Cornelius has 21 years of corporate experience in both legal and commercial negotiations. He has been based in Shanghai and Beijing since 1993, where he has been living and working as a corporate lawyer. From 2000 to 2011 Mr Cornelius was an international partner with one of Australia's leading law firms, specialising in cross border investments in the energy and resource sectors.

Tony, Kiernan, Non Executive Director

Mr Kiernan was previously a commercial lawyer and is currently Chairman of the Australian iron ore producer BC Iron Ltd (ASX:BCI) and a non executive director of several listed mining companies including Chalice Gold Mines Ltd (ASX: CHN), which has been operating in Eritrea since 2009.

Liam Cornelius, Non Executive Director

Mr Cornelius graduated from Curtin University of Technology with a BAppSc in Geology. He has been involved in the exploration industry within Australia and Africa for 18 years. As a founding member of South Boulder Mines, Mr Cornelius has played a key role in outlining areas of interest for the company.

James Durrant, Project Coordinator

Mr. Durrant joined South Boulder Mines after a series of operational roles within BHP Billiton. With tertiary qualifications in both mechanical and mining engineering, Mr. Durrant brings project management, organisational design and operational management of large scale open cut mines skills to the organisation.

Zeray Leake, Country Manager

Mr Leake is a Geologist with over 12 years experience in the development and exploration of potash, gold, base metals and industrial minerals. Mr Leake previously worked for the Geological Survey of Eritrea.

Weathering of Mine Wastes and Tailings in Water-limited (Arid) Settings: Implications for Geochemical and Environmental Control

Protection of groundwater and surface-water, and other environmental values

Dr GD Campbell
Graeme Campbell & Associates Pty Ltd
Bridgetown, Western Australia

Asmara Mining Conference 2014
1-5 October 2014, Palace Hotel, Asmara, Eritrea

Generics

A. Terminology

- **Acid-Rock Drainage (ARD)** or **Acid Mine Drainage (AMD)**
- **Neutral Mine Drainage (NMD)** or **Metalliferous Drainage**

B. Commodity Context

- hard-rock mines, coal mines, minerals sands mines, etc.

C. Rock-water-air (**geochemical**) interactions

- control local **pH regime** and **solute chemistry**
- pH is Master-Variable = f (acid-base balance)

ARD Formation: Thermodynamics / Reaction Mechanism

A. Thermodynamics at **earth-surface-P/T**

- stable *versus* unstable minerals

B. **Gibbs free-energy change** (ΔG) as governed by enthalpic (ΔH) and entropic (ΔS) terms, e.g.

FeS_2 (pyrite) + O_2 + $H_2\mathbf{O}$ = $H_2S\mathbf{O_4}$ + $Fe(OH)_3$ (unbalanced equation)

C. Mechanistically, fundamental to understand that:

- pyrite oxidation is an **electrochemical reaction** (Rimstidt and Vaughan 2003)
- **'freely-available' H_2O** is required for oxidation of reduced-S forms

Control oxidation at arid sites by **preserving residual moistures of ex-pit reactive rock** – the latter invariably 'dry-n-dusty'!

ARD Formation: Kinetics

A. Rates of **surface-chemical reactions**:

- specific-surface area
- **unsaturated, moist conditions** for peak oxidation rates

B. Relative saturations less than 80-85 % for **O_2 supply** to be non-limiting

C. Water content above residual, so **H_2O** is 'freely-available' for reaction

- **porefluid flow** also needed for removal of solutes for peak oxidation rates

Oxidation at arid sites is restricted by **infrequent and limited wetting-front penetration**

Laboratory Testwork Approaches (1)

- Presciptive (?) Compendia for Geochemical Testing
  - MEND (2009)
  - GARD Guide, AMIRA (2002), and others
  - originators may not intend these to be prescriptive, but can easily be perceived as prescriptive by regulators, consultants, etc.

But, in undertaking a characterisation programme:

- **'horses for courses'**
- personal preferences of individual practitioners
- professional judgement as governed by 'drivers' from experience
- R&D / creativity leads to advancement (cf. 'dumbing down')

Laboratory Testwork Approaches (2)

A. **Static Testing** ('whole-rock' analyses and tests)

- S Forms (Sulphide-S, Cr(II)-Reducible-S, SO_4-S)
- Acid-Neutralisation Capacity (chiefly carbonates)
- Net-Acid Generation
- mineralogy

B. **Kinetic Testing** (real-time behaviour with varying moisture / aeration regimes)

- humidity cells and weathering columns
- oxygen-consumption cells

Static and kinetic testing approaches equally applicable for both **water-limited** and **well-watered** sites.

Kinetic-testing (1): Humidity Cells [e.g. ASTM 2013]

Intertek GENALYSIS LABORATORY SERVICES

Kinetic-testing (2): Weathering Columns (e.g. AMIRA 2002)

Kinetic-testing (3): Oxygen-consumption Cells

use weathering-columns to measure
Oxygen-Consumption Rate (OCR) directly

Kinetic-testing (4): Hybrid Approach

use flood-lamps to dewater 'sludge' immediately after flushing to a 'middling-moisture', then keep in an incubator

Sulphide Oxidation and Moisture Status:

Least-Limiting-Water Range (LLWR)

- Long-held concept in soil science and agronomy

- Moisture limits on **plant growth**:

  - 'wet-end': $_v$ > 80-90 % of ⇒ impeded, O_2-limited
  - **'middling'**: ⇒ **optimal**
  - 'dry-end': $_t$ > *c.* 10-20 bars ⇒ impeded, H_2O-limited

- Moisture limits on **sulphide oxidation**:

  - **'wet-end'**: $_v$ > 80-90 % of ⇒ **impeded, O_2-limited**
  - 'middling': ⇒ optimal
  - **'dry-end'**: $_t$ > *c.* 10-20+ bars ⇒ **impeded, H_2O-limited**

Value of looking beyond geology and engineering, and **cross-correlating with concepts from other earth-science disciplines**.

Pulsed & Zonal Weathering in Arid Lands

A. **Pulsed Dynamics** in Arid Lands shared by:

- biotic responses – from microbial soil surface crusts to growth stimuli and fruiting by under and upper storey plant species; commencement of next predator-prey cycle, etc.

- **rock-water-air interactions**

B. **'Weathering-windows'** for oxidation are:

- restricted to sizeable wet-spells (e.g. 10+ mm)

- transient / short-lived as rapid drying immediately kicks-in

C. **Locus of weathering** confined to reach of irregular, 'fingered' wetting-front

Seasonality of oxidation 'spikes' at arid sites allows preparation ahead of major storm arrivals (e.g. **rate-of-rise of reactive profile** during waste-dump construction linked to timing of episodic wet-spells).

Sulphide Oxidation and Moisture Status: Demo 1

Grey-Tails ⇒

Rapid Drying
(hours-to-days)

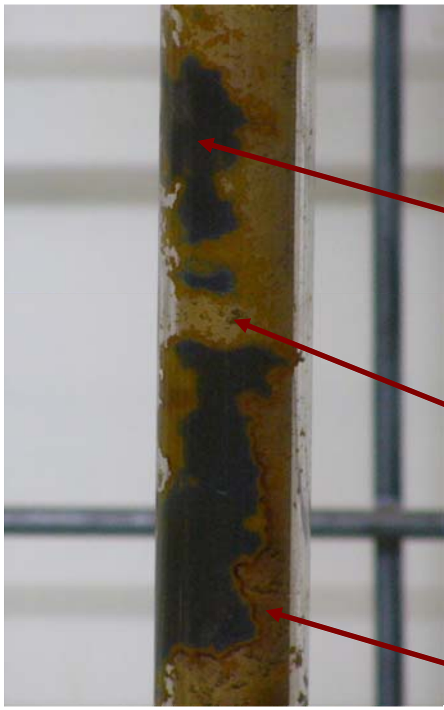
Brown-Tails ⇒

Delayed Drying
(weeks+)

Slurry of near-monomineralic pyrite left to free-drain with E_p (at tailings-bed surface) approx. 10 mm/day; pH = 2-4

Sulphide Oxidation and Moisture Status: Demo 2

Localised moisture gradients, due to segregation of fines



- **Dark Grey** saturation-zones
  ⇒ **unoxidised**
- **Light-brown** and “just damp” distal from saturation-zones
  ⇒ **least oxidised**
- **Orange** and moist proximal to saturation-zones
  ⇒ **most oxidised**

Reactive tailings wetted from below via wicking; reaction over weeks

After rapid drying (days)

Wetting/Weathering-Front Coincidence

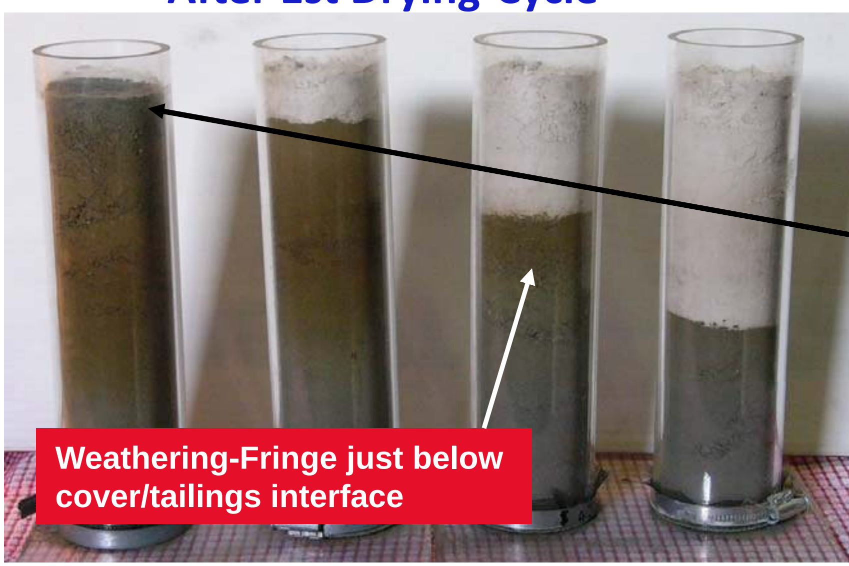
After 1st Wetting-Cycle

- **lag-phase** (i.e. circum-neutral) weathering of PAF-tailings with/without 'store-release-cover'

- Fe-pigmentation = **locus of sulphide-oxidation**

- 23 mm pulse of water
  + 1 day of redistribution
  + 6 days of E_p of *c.* 10-15 mm/day via heating-lamps with side-wall insulation $\Rightarrow$ strong diurnal-T gradients

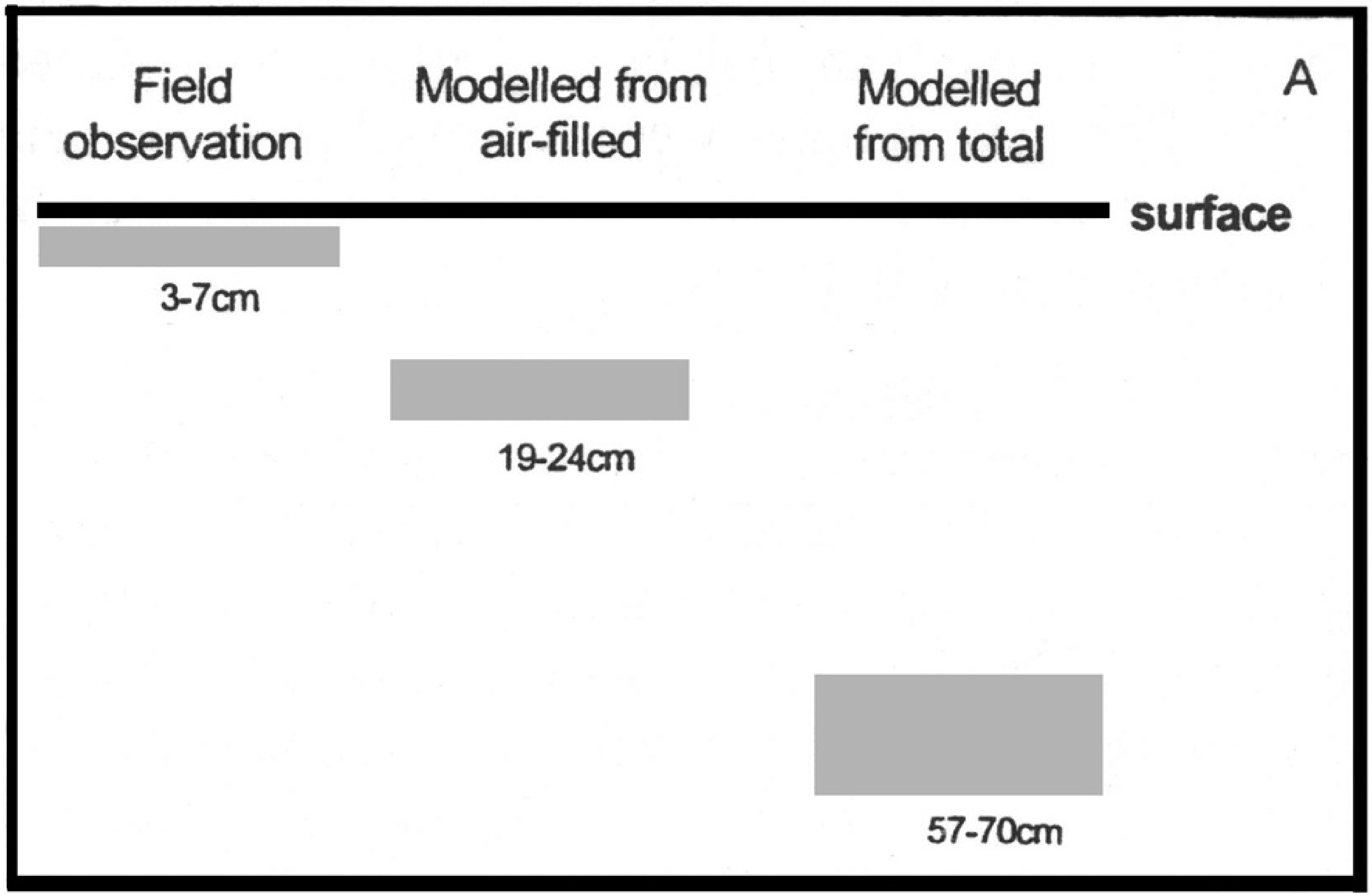
After 1st Drying-Cycle



'Grey-Tailings' ($\Rightarrow$ largely unoxidised) in top cm, due to instant evaporative-drying, and thus stifled sulphide-oxidation

Field Example: Hardpan Formation in an 'Old' (30-40 yrs) Massive-Sulphide-TSF in NSW Arid-Zone

Alternative Interpretation: **Wetting-front** *versus* O_2-diffusion-front control



Agnew and Taylor (2000), 5th ICARD (Denver)

Key Management Outcome: Climate Dependence of Oxidation

A. Pyrite Oxidation in **Well-Watered Settings**

$$FeS_2 + 15/4\ O_2 + 7/2\ H_2O = H_2SO_4 + Fe(OH)_3$$

$\Rightarrow$ **Control of O_2-supply** is 1st-order control strategy

B. Pyrite Oxidation in **Water-Limited Settings**

$$FeS_2 + 15/4\ O_2 + 7/2\ H_2O = H_2SO_4 + Fe(OH)_3$$

$\Rightarrow$ **Control of H_2O-supply** is 1st-order control strategy

Locate pyrite beneath reach of shallow seasonal wetting-front

$\Rightarrow$ **optimise 'unsaturated freeboard' in terms of Water Holding Capacity (WHC)**

Engineering & Cost Implications

A. **Basal-blanket** of benign soil / regolith materials (cf. HDPE liners, etc.)

- not compacted, but paddock dumped and dozed
- WHC likely 300+ mm (site-specific specification)

B. **End-tipping** *versus* **bottom-up construction** during waste-dump operation

- WHC of reactive profile being built; **rate-of-rise** of reactive profile
- role of traffic layer at top of lifts: enhanced WHC

C. **Free-draining cover profile** for infiltration control at closure (cf. multi-layered, heavily engineered covers at well-watered sites)

- **not** purpose compacted
- WHC likely 300+ mm (site-specific specification)
- **erosion stability**
- 'patched' distribution of vegetation – natural analogue in arid lands

Arid sites generally offer more 'degrees of freedom' for geochemical control

Quantifying Water-Holding Capacity (1)

- **Suction-plates** and **pressure-chambers**
- Only suited to small moulds, due to equilibration-time constraints

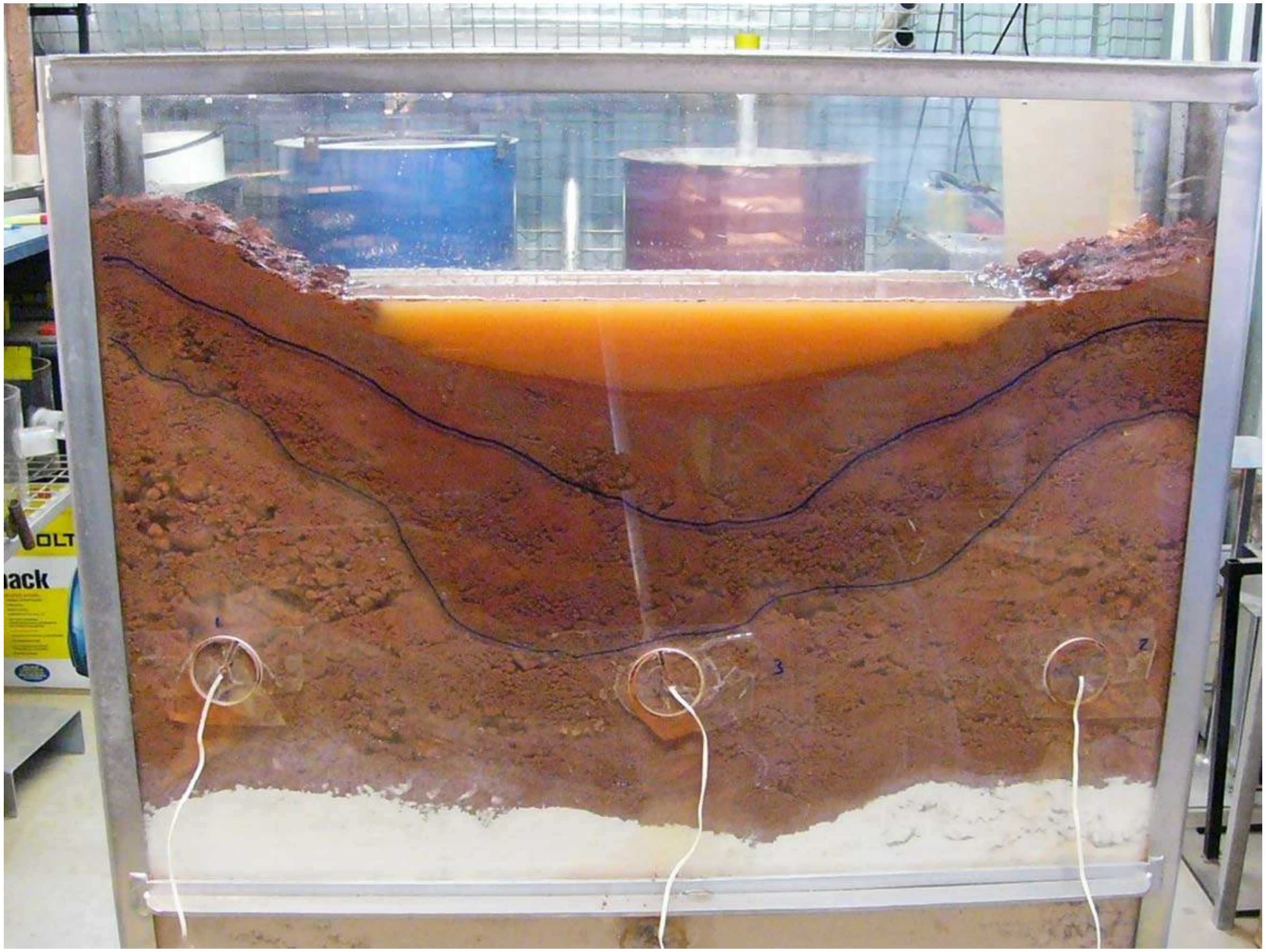
Quantifying Water-Holding Capacity (2)

- **Column-Infiltration Technique**
  - can be applied to estimate WHC of reactive lithotypes being isolated

    e.g. pyritic carbonaceous shales with WHC *c.* 100 mm/m

Cover Ripline Infiltration Capacity (1)

Cover Ripline Infiltration Capacity (2)



- 60 mm Total Storm-Depth

CONCLUSIONS

A. **Geochemical Instability** (e.g. pyritic units) does **NOT** depend on site climate – it is, what it is, where ever it is!

However, expression of this instability in terms of **Reactivity DOES** depend on climate – reactivity suppressed in strongly arid settings.

B. Testing approaches relevant to both arid and well-watered sites.

C. **Pulsed oxidation dynamics** at arid sites from episodic rainfall

Locate pyritic units beneath reach of shallow seasonal wetting-front

D. Arid sites generally offer **more 'degrees of freedom',** and **longer 'response times', for geochemical control**

- **'unsaturated freeboard'** and **water holding capacity**

Acknowledgements

- Eamonn Dare, Bisha Mining Share Company
- Asmara Mining Conference Committee (Seife Berhe)
- Serge Smolonogov (formerly at Bisha)
- Lots of clients since the late-1980s
- Ann Evers / John Flynn, Genalysis Laboratory Services
- Roger and Daniel Townend, Townend Mineralogical Laboratory

Prospects of Haykota with Special Reference to Yacob Dewar VMS Deposit, Western Eritrea

By

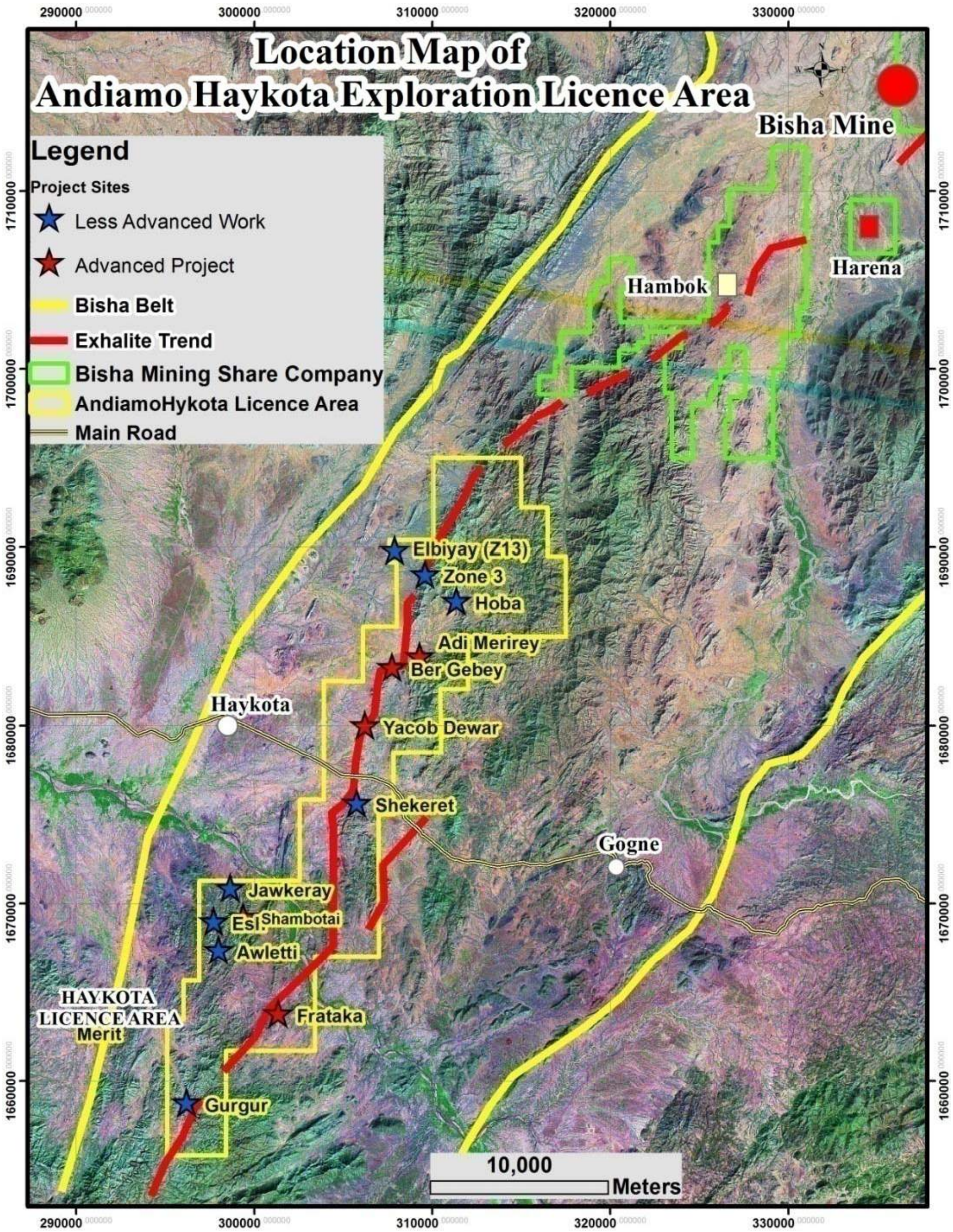
Seife M. Berhe and Tim Williams

Presented at Asmara Mining Conference
Asmara, Eritrea
2 October 2014

The Company

- A private company, based in London, UK, exploring in Eritrea, East Africa
- Andiamo is focused on: **Volcanic Massive Sulphides (Copper / Zinc) and gold deposits**
- Has a 235 km Haykota Exploration Licence, which contains the Yacob Dewar and Ber Gebey mineral deposits, which Andiamo is currently exploring.

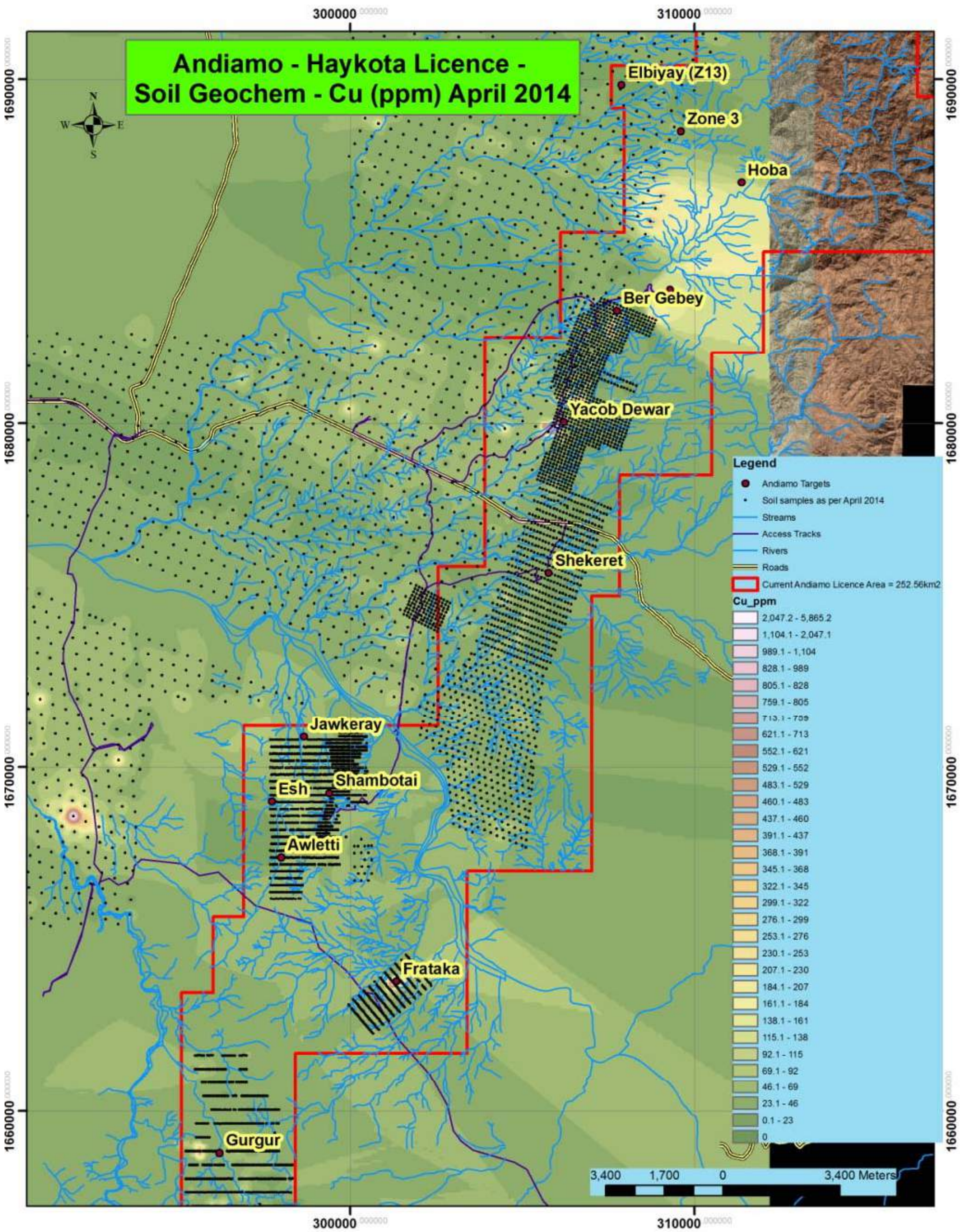
- **Track record of discoveries include:**
  - ✓ Yacob Dewar VMS system – Advanced project
  - ✓ Ber Gebey VMS system
  - ✓ Adi Merirey VMS system
  - ✓ Frataka VMS system
  - ✓ Hoba VMS system.
  - ✓ Shambotai, Jawkeray and Gurgur gold fields



Haykota license area located along the Bisha VMS Belt

Geology and Mineralization

- Geologically the Haykota project area forms part of the Arabian-Nubian Shield, which is formed by Upper Proterozoic folded rock sequence and sheared zones;
- Very prospective for VMS deposits: presence of gossans and silica barite;
- Presence of artisanal mining and anomalous soil geochem results on the southern part of the license area: Shambotai and Gurgur.

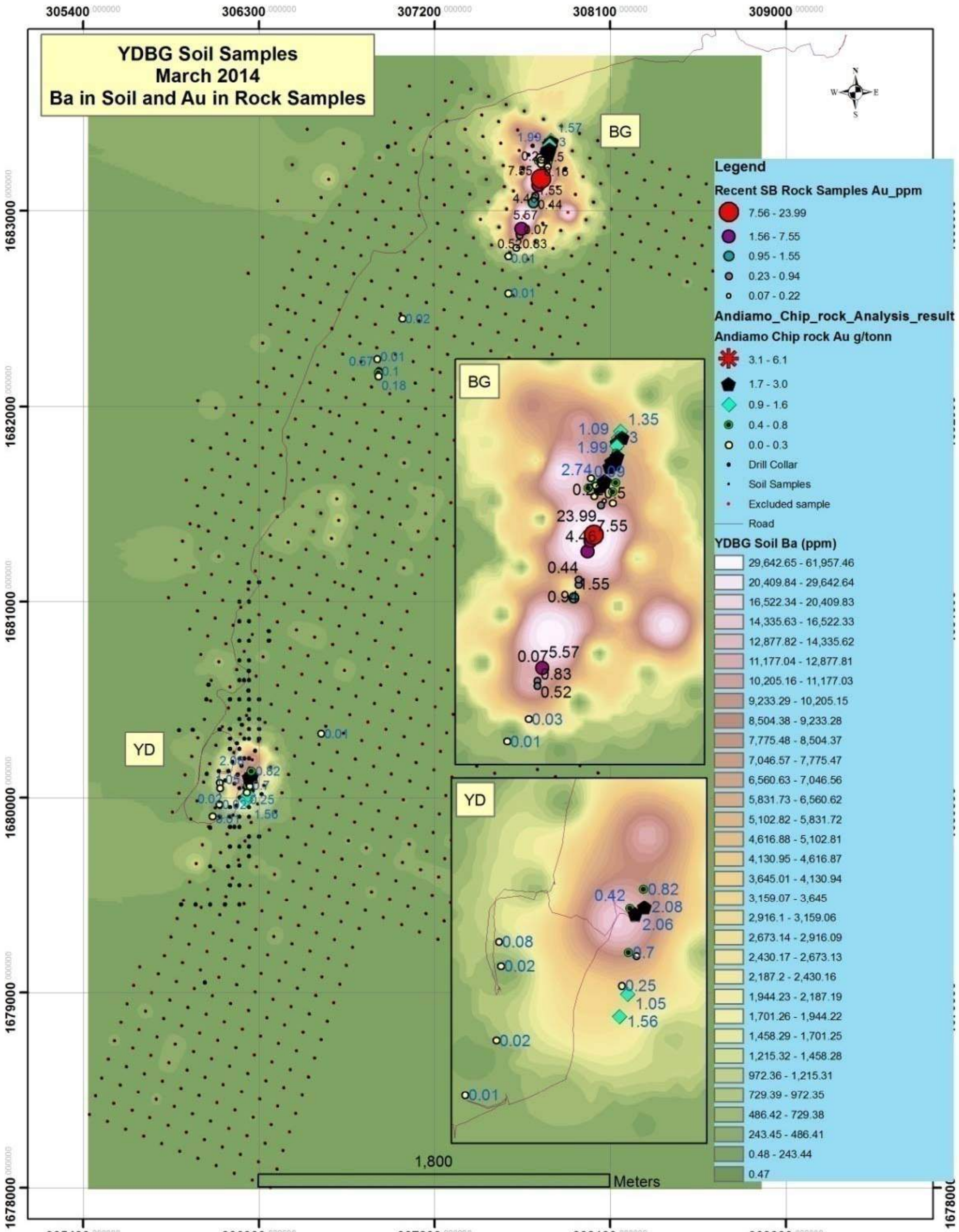


Outline of Regional and Detailed Soil Sampling

Cu Results (ppm)

A total of 7223 soil samples collected

Sampling Space
400*400m
200*200
200*100
100*100
200*50
100*25
400*50



Soil sampling of the Yacob Dewar and Ber Gebey corridor showed anomalous Au and Cu results.

Follow up drilling was conducted.

Regional Airborne Survey

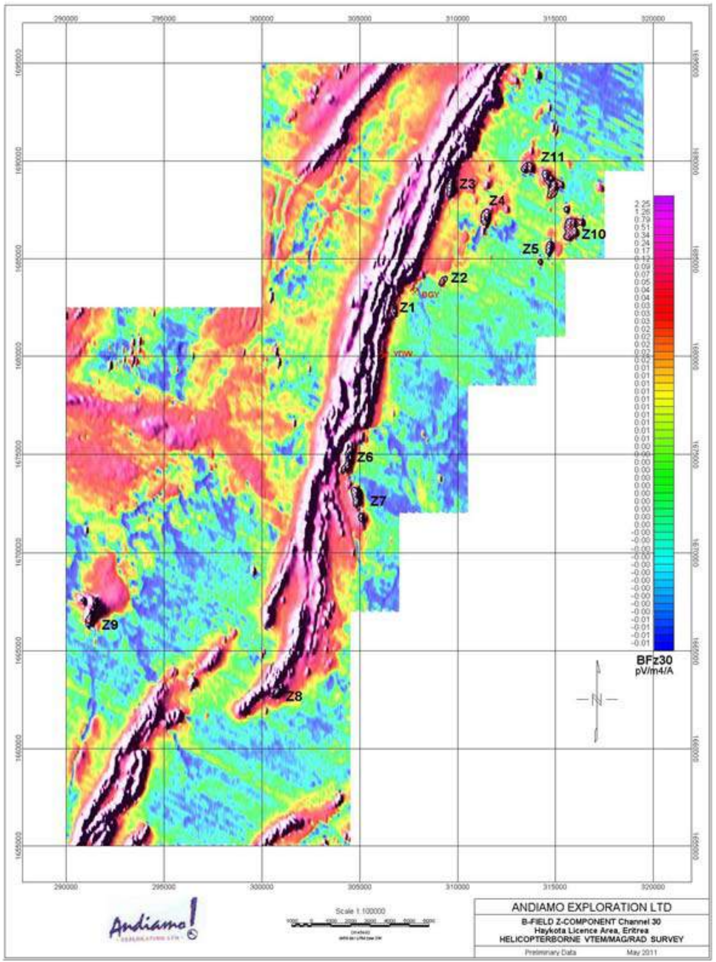


Figure B1. Shaded B-field Z-component Channel 30. Sun angle 298°, inclination 30°.

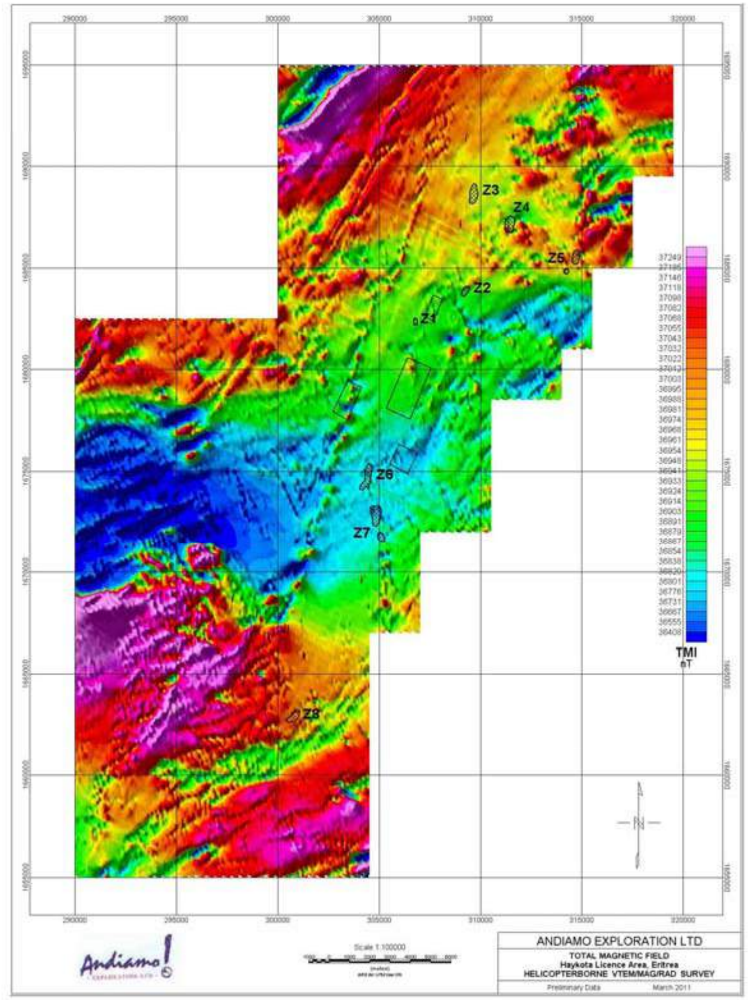
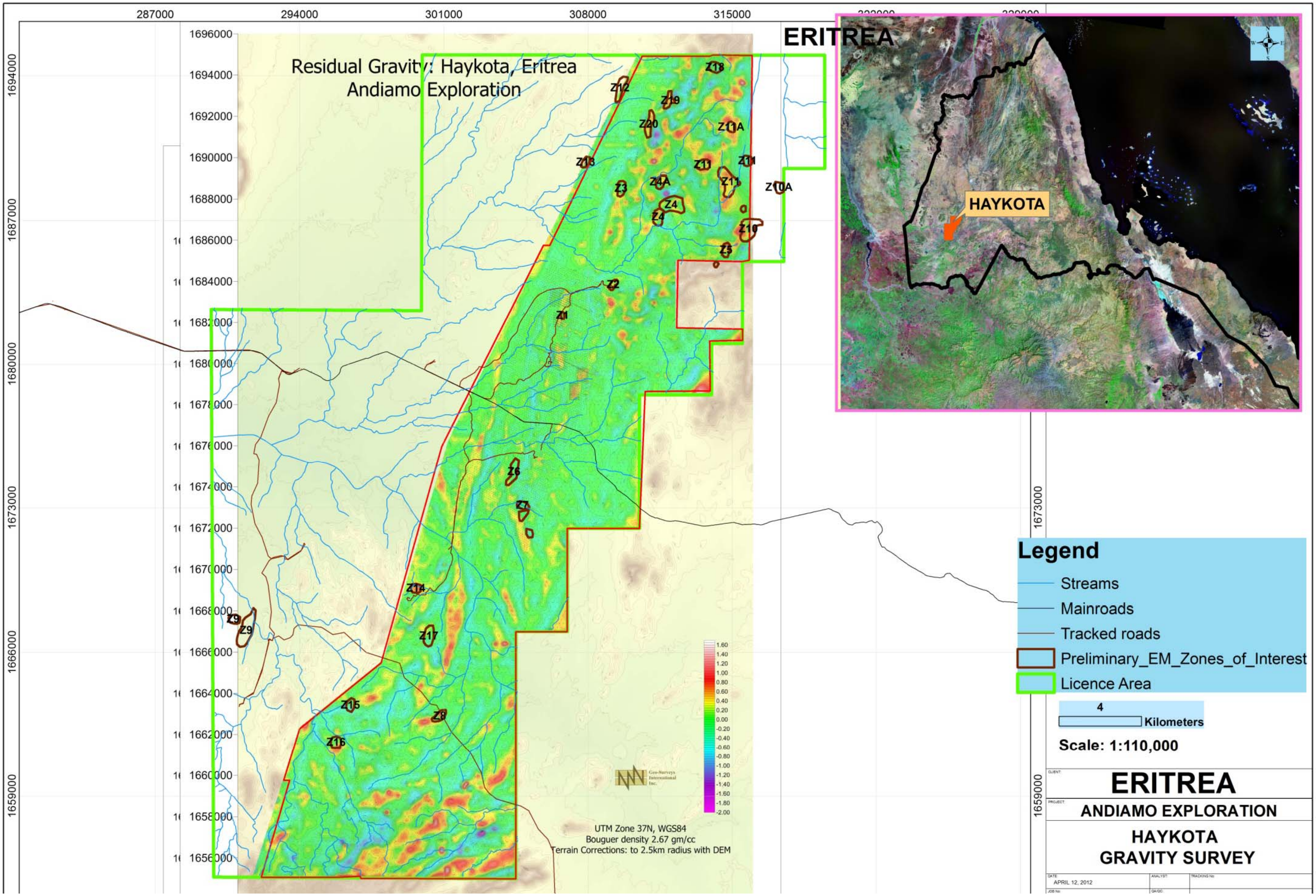
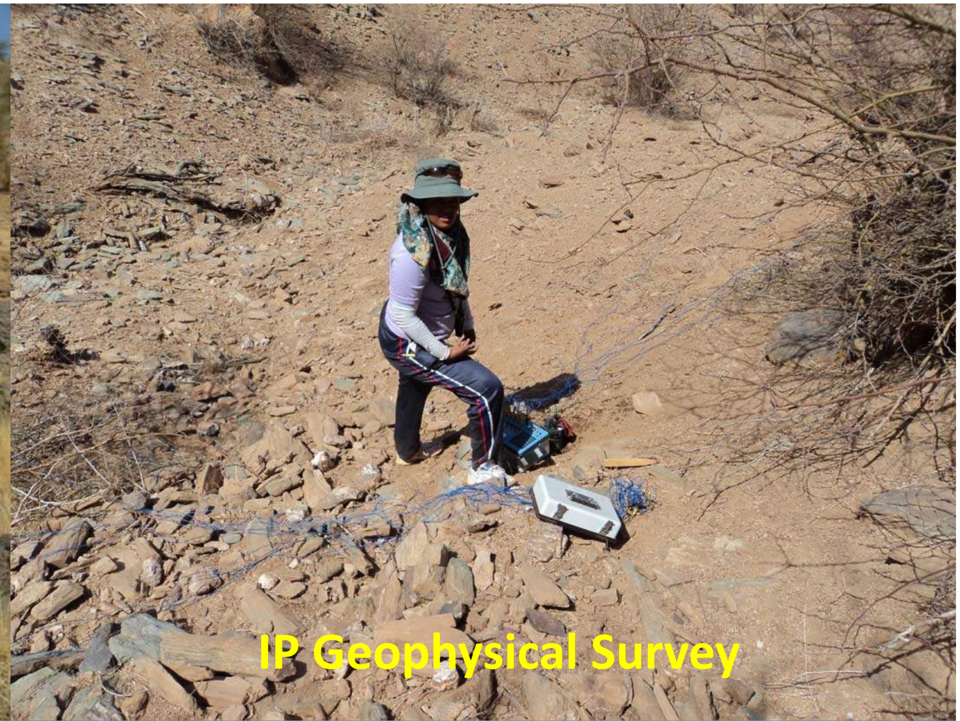


Figure B4. Shaded total magnetic field. Sun angle 208°, inclination 30°.

Integrated Gravity & EM Geophysical Survey Data

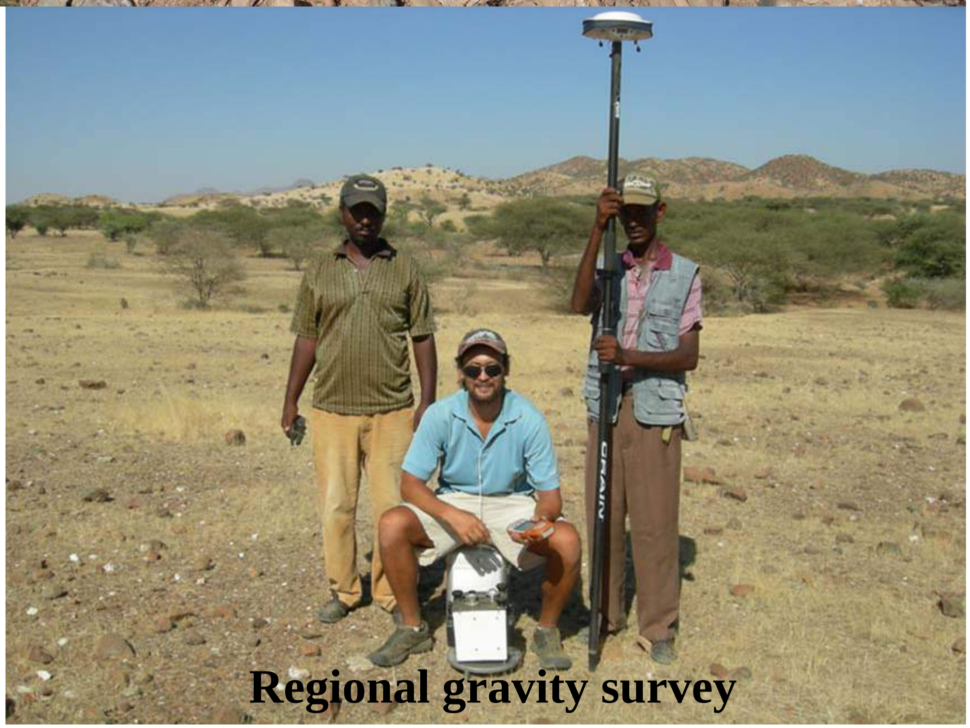




IP Geophysical Survey

Magnetic Survey

Regional gravity covered an area of 360 km² which is 46% of the exploration license area.



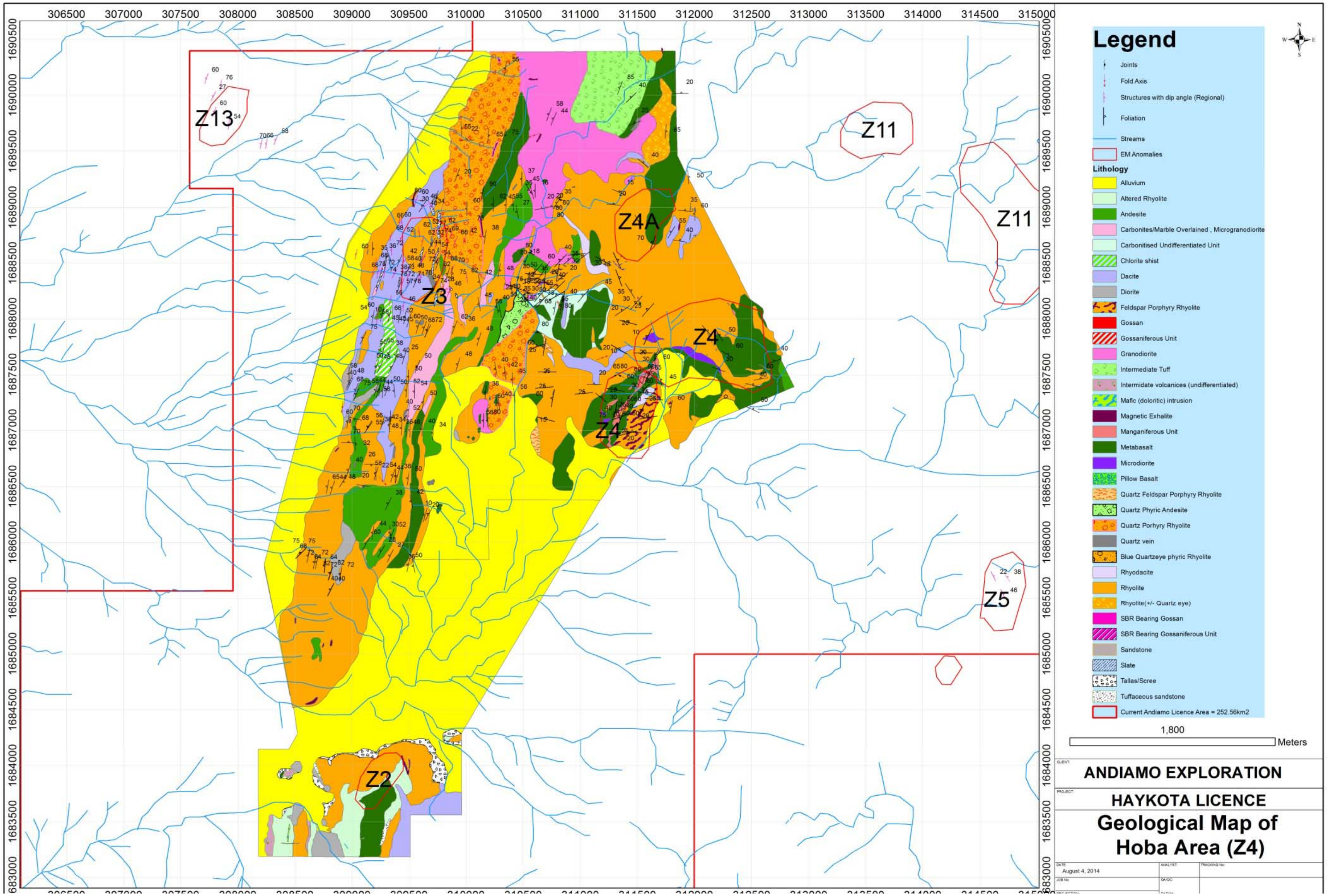
Regional gravity survey

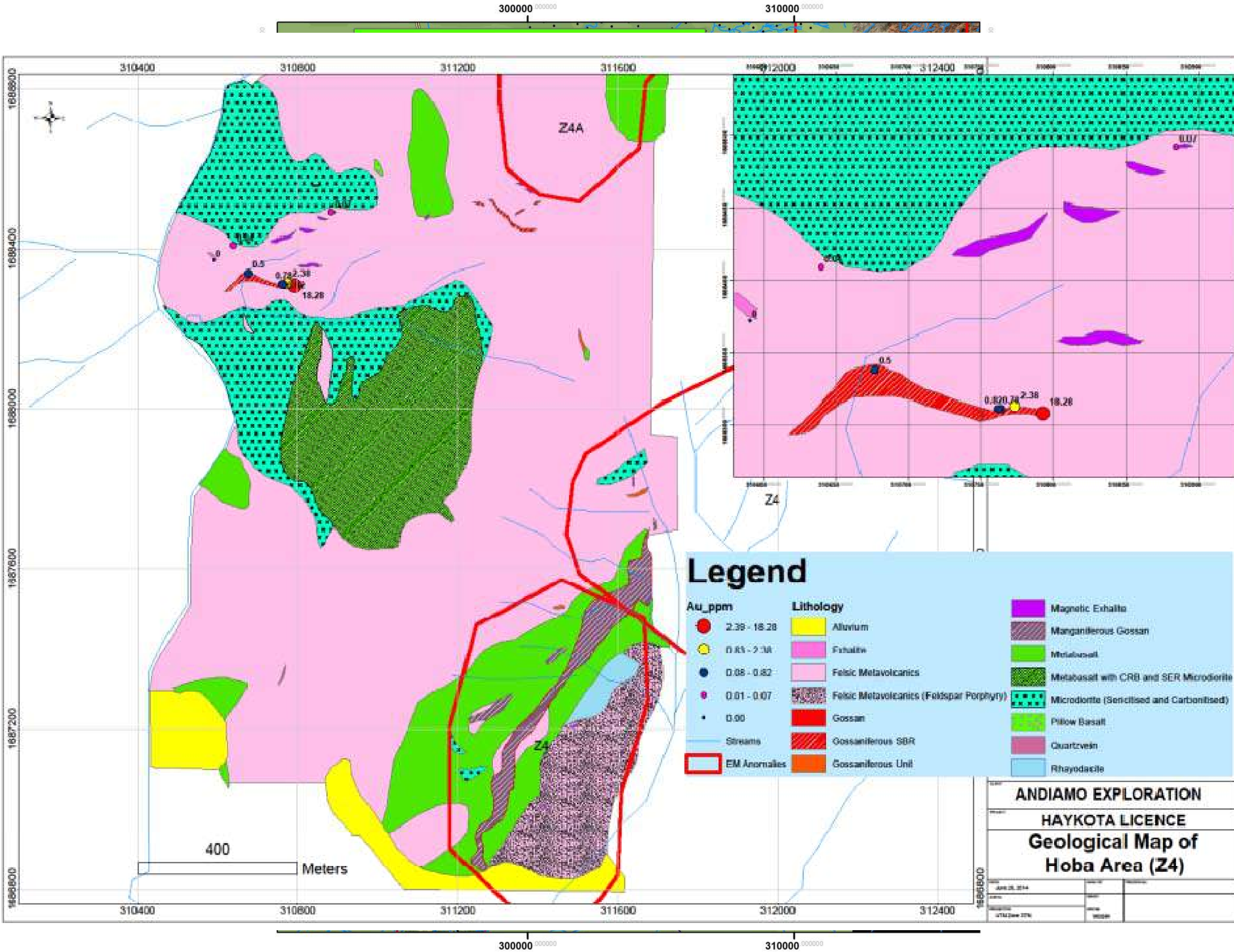
Case Study of Prospect Areas

Detailed follow up of prospective mineralised areas was conducted using various exploration techniques. The projects are divided into advanced and less advanced projects and only five case studies are presented :

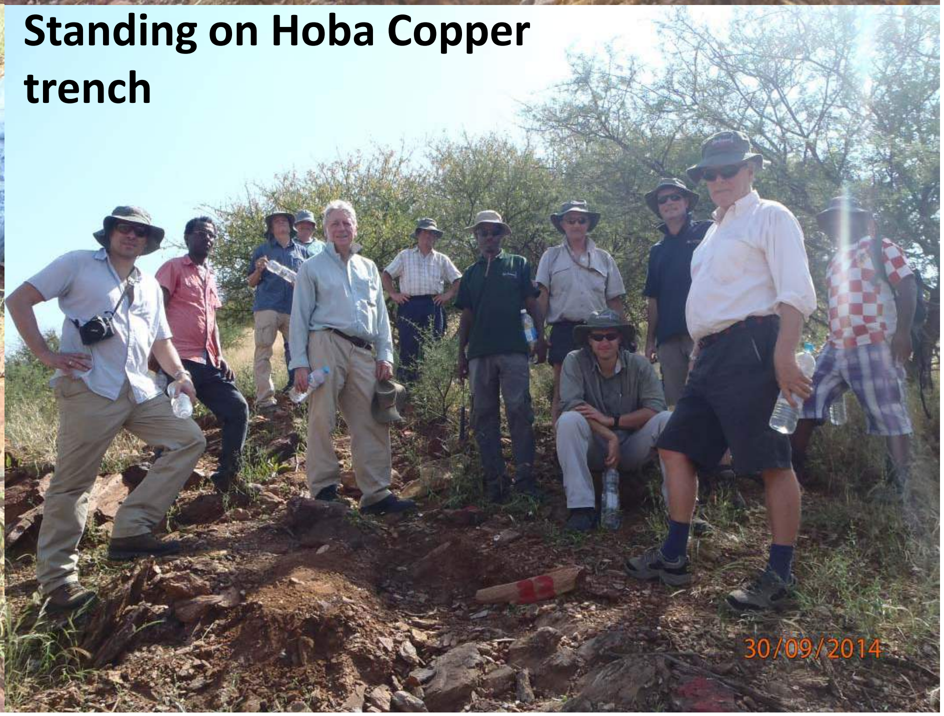
- Yacob Dewar - Ber Gebey VMS system: **Advanced project**
- Hoba VMS prospect
- Adi Merirey VMS prospect
- Frataka VMS prospect
- Shambotai, Jawkeray and Gurgur shear hosted gold fields

Hoba VMS Prospect Geological Map

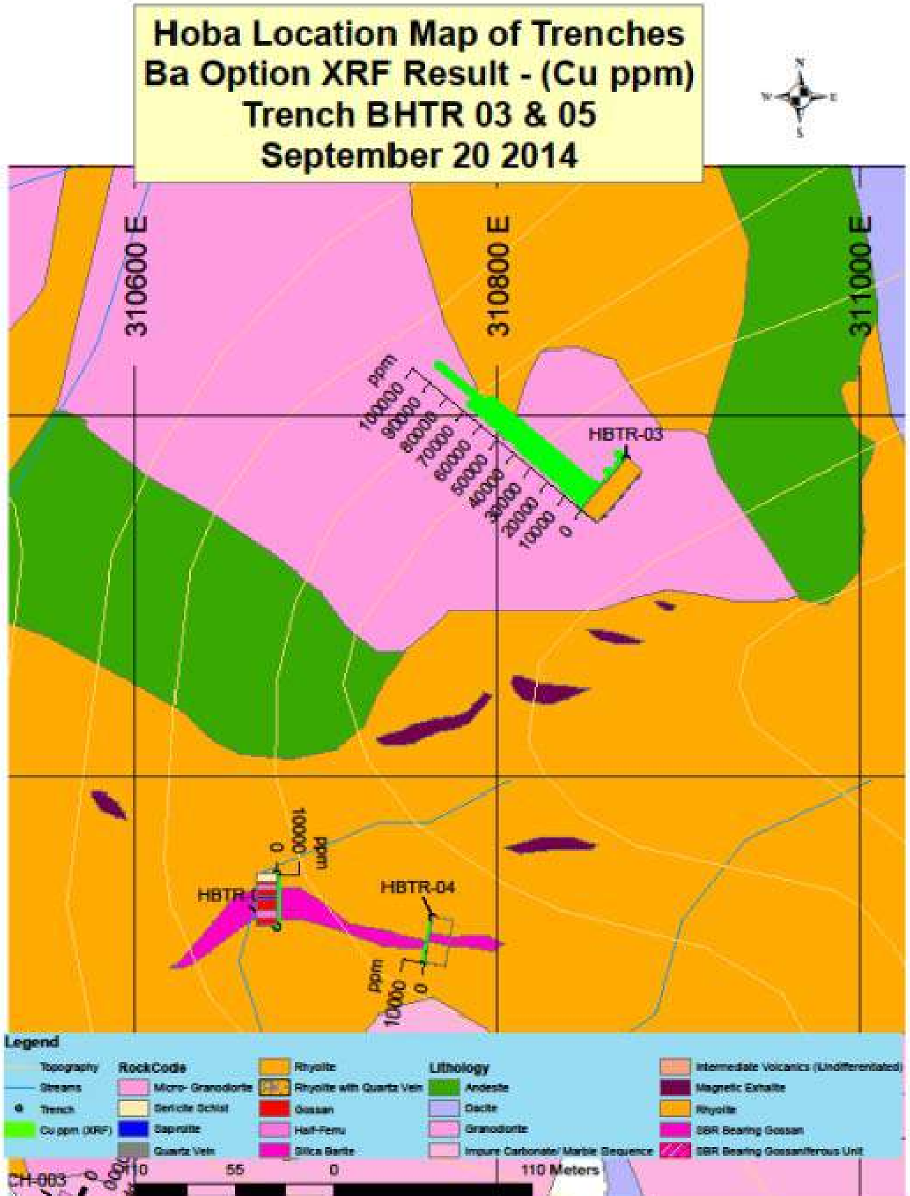


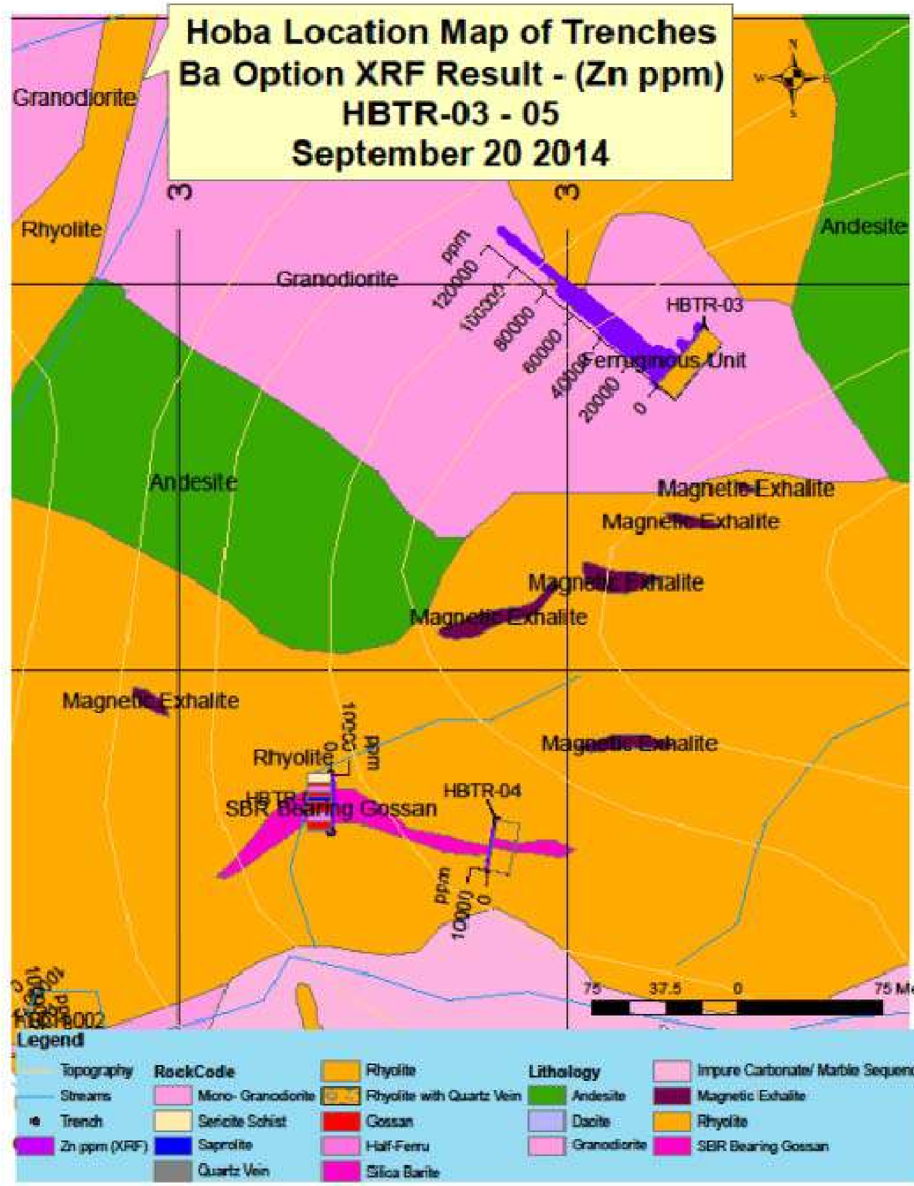


Z4A
Z4
0.5
2.38
18.28
400
Meters
Legend
Au_ppm
2.39 - 18.28
0.08 - 0.82
0.01 - 0.07
0.00
Streams
EM Anomalies
Lithology
Alluvium
Felsic Metavolcanics
Felsic Metavolcanics (Feldspar Porphyry)
Gossan
Gossaniferous SBR
Gossaniferous Unit
Magnetic Exhalite
Manganiferous Gossan
Metabasalt with CRB and SER Microdiorite
Microdiorite (Sericitised and Carbonitised)
Pillow Basalt
Quartzvein
Rhayodacite
ANDIAMO EXPLORATION
HAYKOTA LICENCE
Geological Map of
Hoba Area (Z4)



Standing on Hoba Copper trench

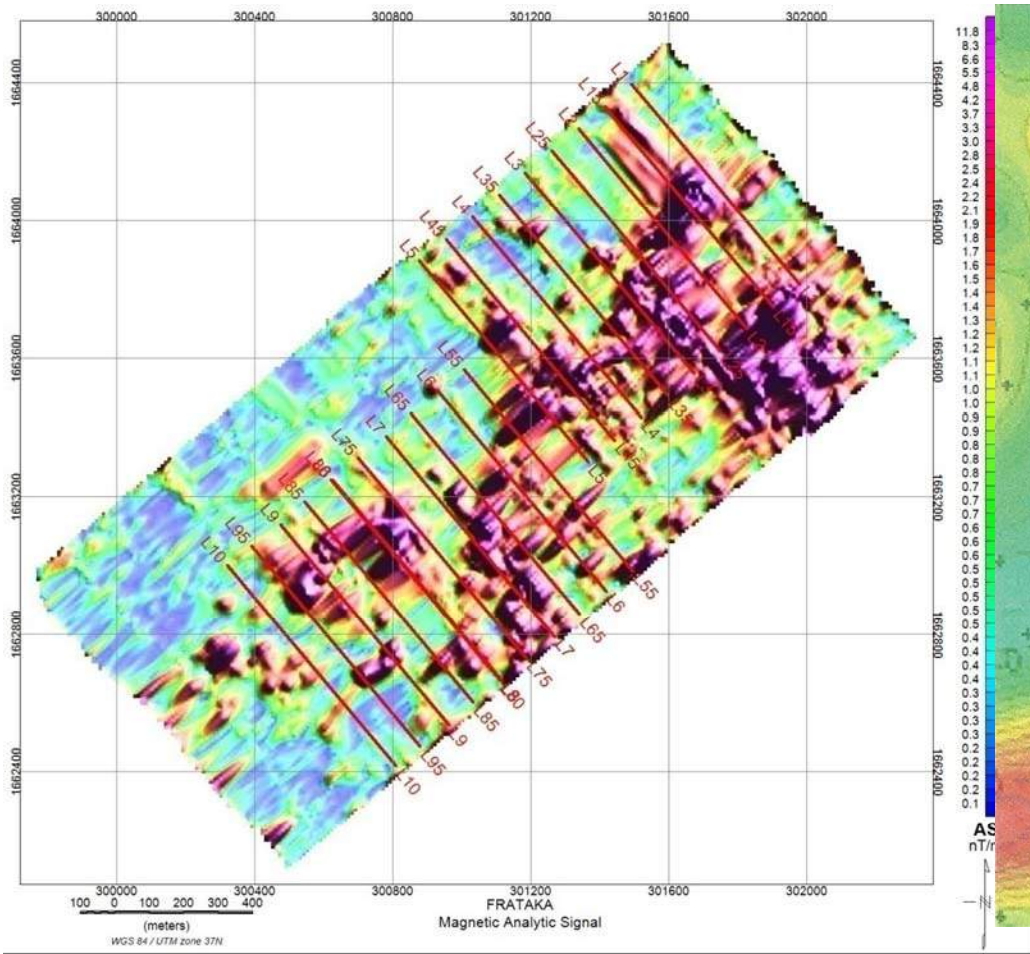

Hoba Location Map of Trenches
Ba Option XRF Result - (Cu ppm)
Trench BHTR 03 & 05
September 20 2014
310600 E
310800 E
311000 E
HBTR-03
HBTR-04
ppm
Legend
Topography
Streams
Trench
Cu ppm (XRF)
RockCode
Micro- Granodiorite
Sericite Schist
Saprolite
Quartz Vein
Rhyolite
Rhyolite with Quartz Vein
Gossan
Half-Ferru
Silica Barite
Lithology
Andesite
Dacite
Granodiorite
Impure Carbonate/ Marble Sequence
Intermediate Volcanics (Undifferentiated)
Magnetic Exhalite
Rhyolite
SBR Bearing Gossan
SBR Bearing Gossan/ferrous Unit
110 55 0 110 Meters

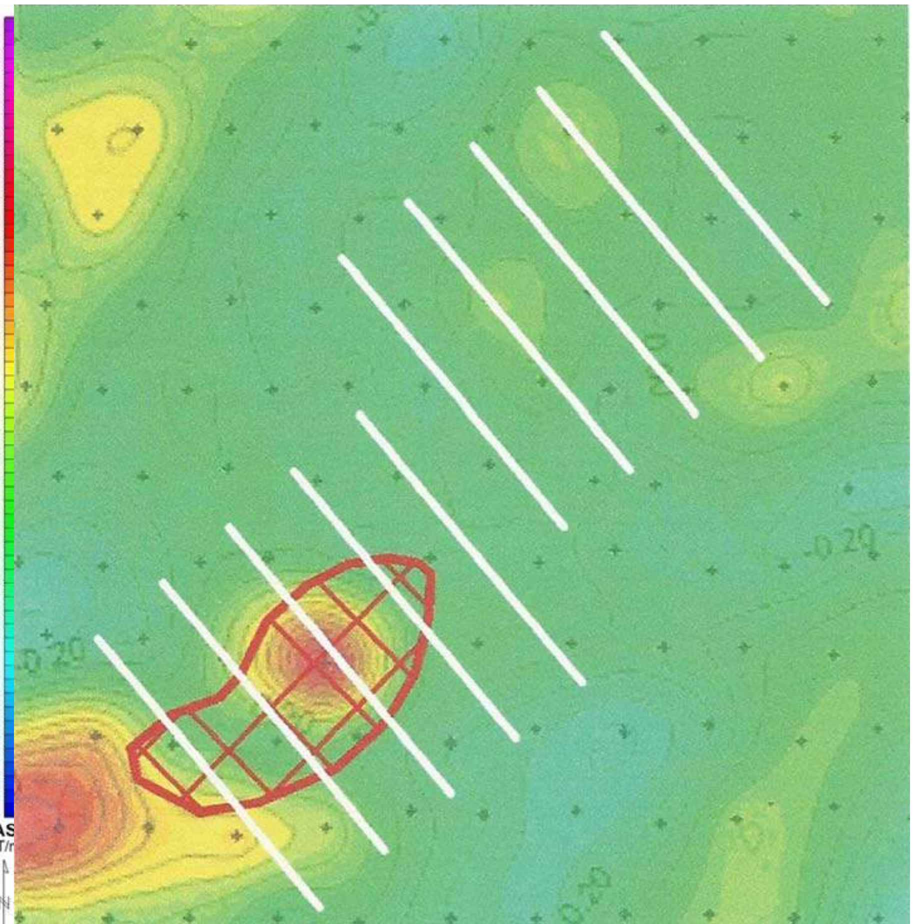

Hoba Location Map of Trenches
Ba Option XRF Result - (Zn ppm)
HBTR-03 - 05
September 20 2014
Granodiorite
Rhyolite
Andesite
HBTR-03
Ferruginous Unit
Magnetic Exhalite
Rhyolite
SBR Bearing Gossan
HBTR-04
ppm
75 37.5 0 75 Meters
Legend
Topography
Streams
Trench
Zn ppm (XRF)
RockCode
Micro- Granodiorite
Sericite Schist
Saprolite
Quartz Vein
Rhyolite
Rhyolite with Quartz Vein
Gossan
Half-Ferru
Silica Barite
Lithology
Andesite
Dacite
Granodiorite
Impure Carbonate/ Marble Sequence
Magnetic Exhalite
Rhyolite
SBR Bearing Gossan

Adi Merirey VMS system

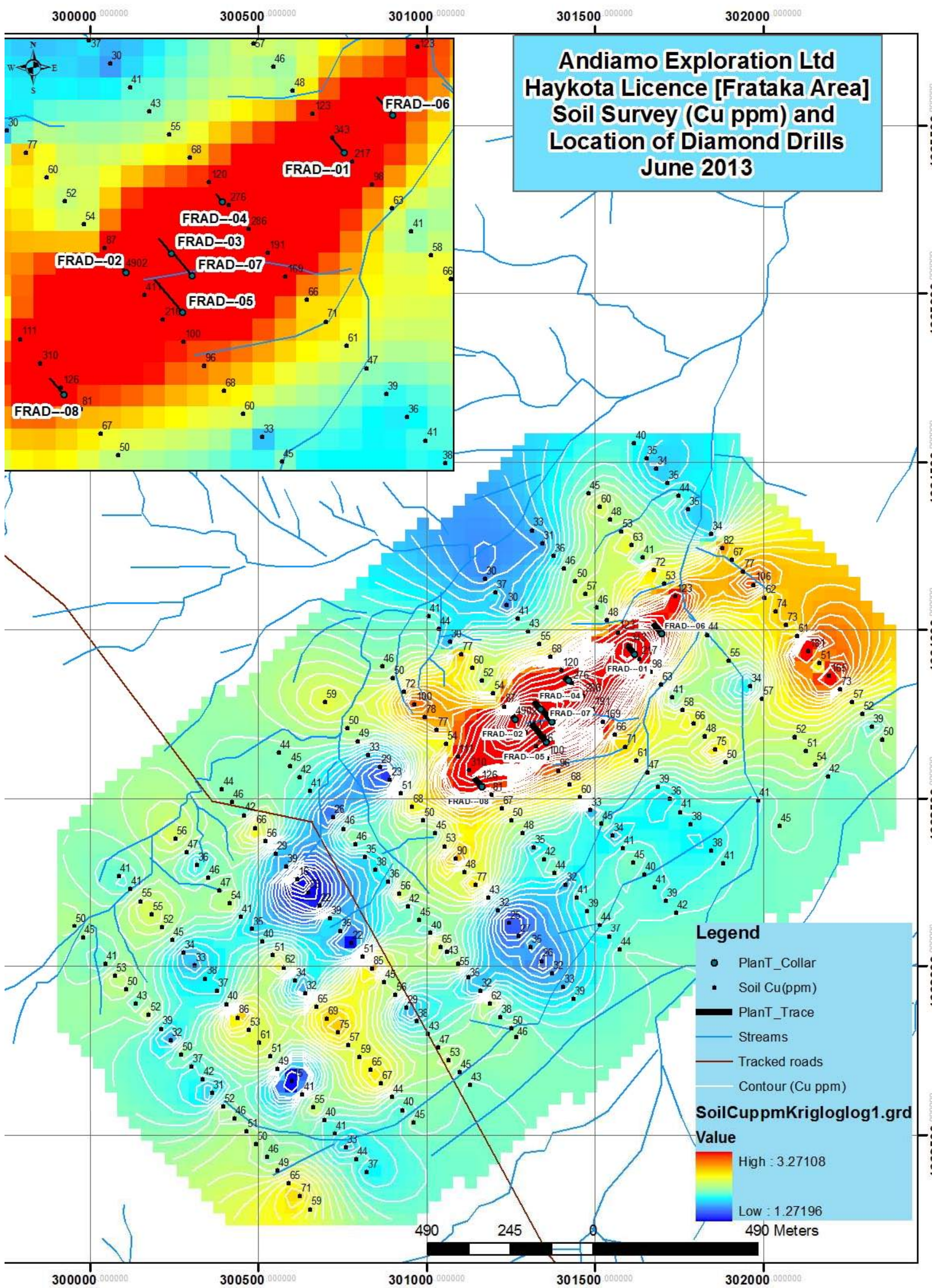
- NE of Yakob Dewar about 5 km
- Strong geophysical anomaly
- Extensive disseminated sulphides
- Gold and copper values in gossan
  - ✓ 2011: Geology mapping discovered gossan
  - ✓ 2012: 8 diamond drill holes completed
- Incl. 15 metres grading approx 0.5% copper

Frataka Gold and Copper VMS Prospect



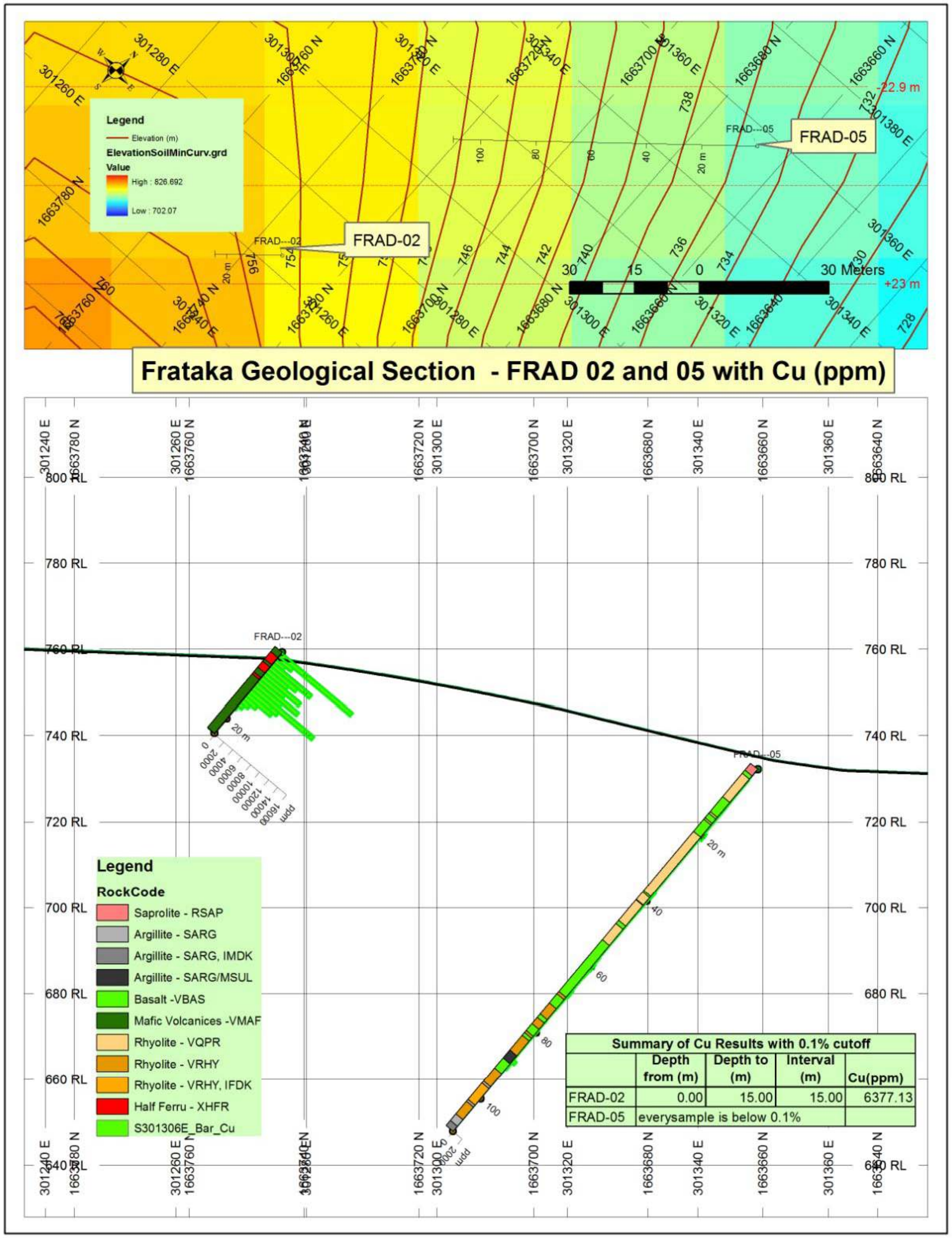


Based on anomalous EM and gravity data, geological and soil sampling and IP surveys were conducted. Followed by exploratory drilling.



Anomalous Cu in soils at Frataka.

Malachite in rock outcrops



Summary of Cu Results with 0.1% cutoff

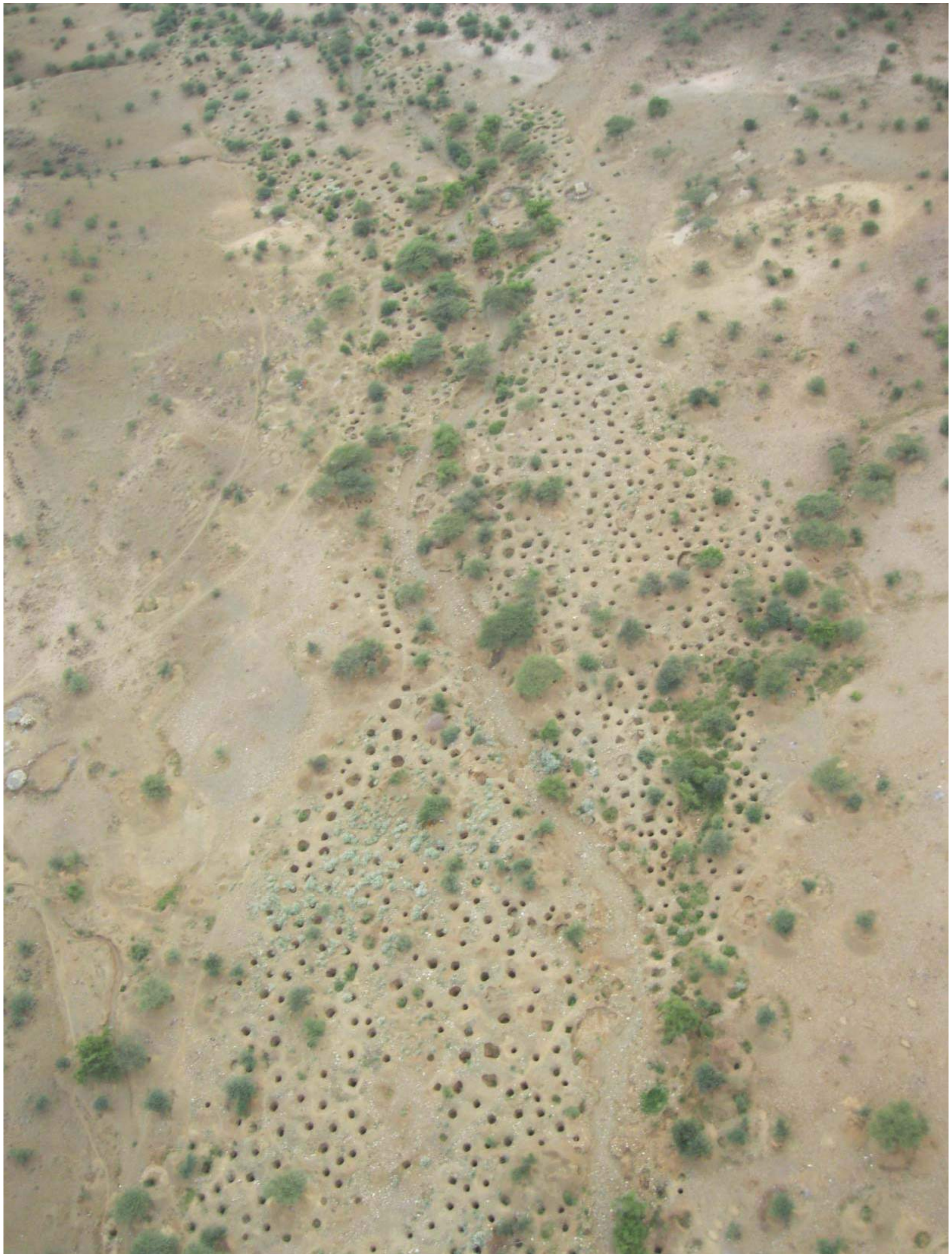
	Depth from (m)	Depth to (m)	Interval (m)	Cu(ppm)
FRAD-02	0.00	15.00	15.00	6377.13
FRAD-05	everysample is below 0.1%			

Frataka

Cu results in drill holes FRAD 02 & 05

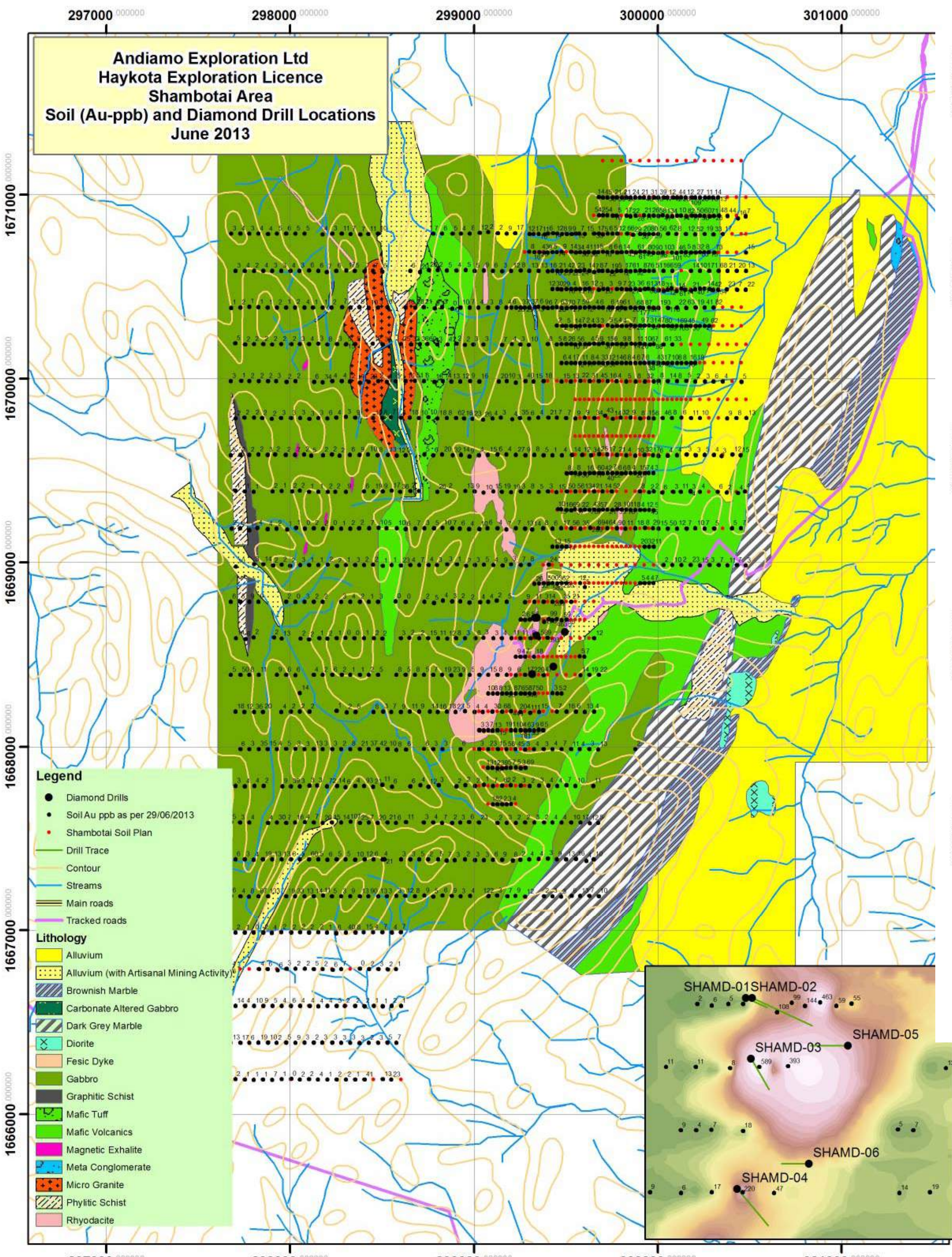
Shambotai –Gurgur Gold Prospect Area

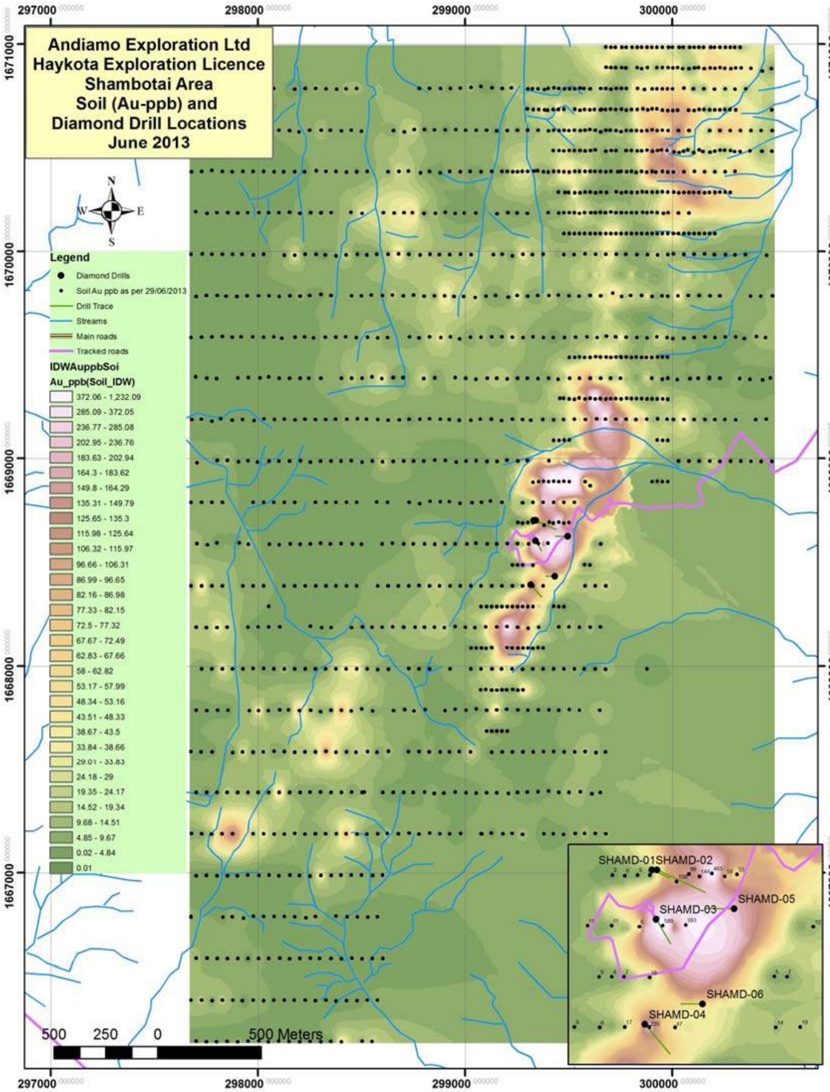
- The Shambotai-Jawkerai and Gurgur gold occurrences have been known for over 20 years because of artisanal workings.
- Systematic exploration by Andiamo Exploration, which included rock chip, stream sediment, magnetic and geostructural studies has shown that this area contains major shear hosted gold deposits that are controlled by major shear zones, which forms a flower structure.
- There is also extensive development of several quartz veins in the area. Very encouraging results have been discovered.

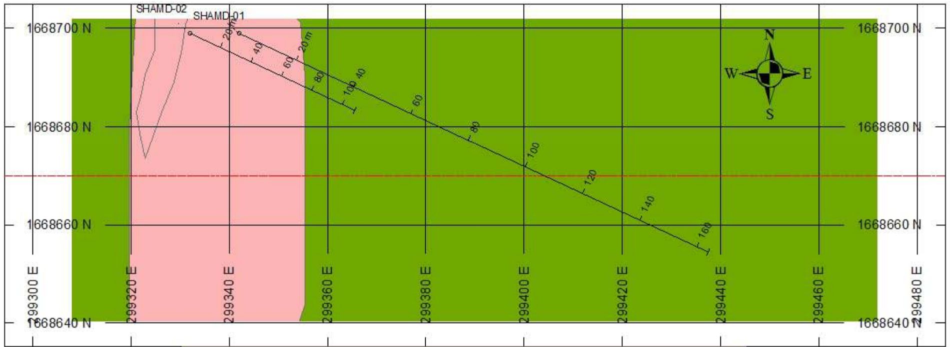


Shambotai

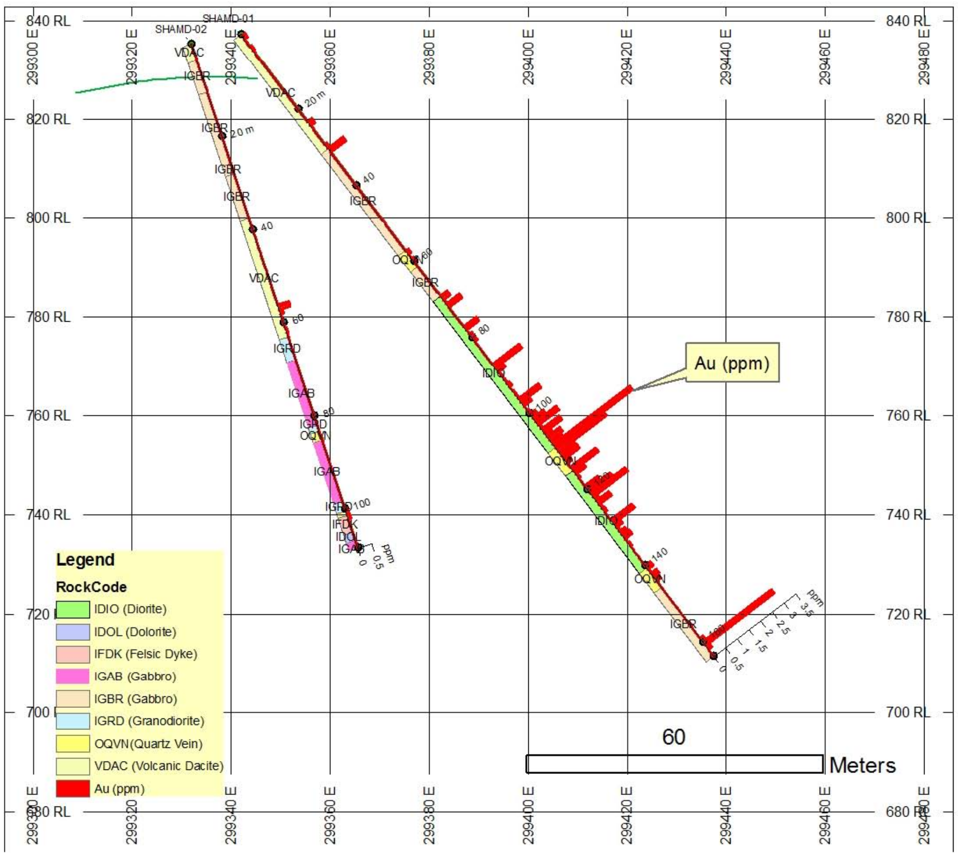
Artisanal pits observed from a helicopter


Andiamo Exploration Ltd
Haykota Exploration Licence
Shambotai Area
Soil (Au-ppb) and Diamond Drill Locations
June 2013
297000
298000
299000
300000
301000
1671000
1670000
1669000
1668000
1667000
1666000
Legend
Diamond Drills
Soil Au ppb as per 29/06/2013
Shambotai Soil Plan
Drill Trace
Contour
Streams
Main roads
Tracked roads
Lithology
Alluvium
Alluvium (with Artisanal Mining Activity)
Brownish Marble
Carbonate Altered Gabbro
Dark Grey Marble
Diorite
Fesic Dyke
Gabbro
Graphitic Schist
Mafic Tuff
Mafic Volcanics
Magnetic Exhalite
Meta Conglomerate
Micro Granite
Phylitic Schist
Rhyodacite
SHAMD-01SHAMD-02
SHAMD-03
SHAMD-05
SHAMD-06
SHAMD-04


Andiamo Exploration Ltd
Haykota Exploration Licence
Shambotai Area
Soil (Au-ppb) and
Diamond Drill Locations
June 2013
297000
298000
299000
300000
1671000
1670000
1669000
1668000
1667000
N
W
E
S
Legend
Diamond Drills
Soil Au ppb as per 29/06/2013
Drill Trace
Streams
Main roads
Tracked roads
IDWAuppbSoi
Au_ppb(Soil_IDW)
372.06 - 1,232.09
285.09 - 372.05
236.77 - 285.08
202.95 - 236.76
183.63 - 202.94
164.3 - 183.62
149.8 - 164.29
135.31 - 149.79
125.65 - 135.3
115.98 - 125.64
106.32 - 115.97
96.66 - 106.31
86.99 - 96.65
82.16 - 86.98
77.33 - 82.15
72.5 - 77.32
67.67 - 72.49
62.83 - 67.66
58 - 62.82
53.17 - 57.99
48.34 - 53.16
43.51 - 48.33
38.67 - 43.5
33.84 - 38.66
29.01 - 33.83
24.18 - 29
19.35 - 24.17
14.52 - 19.34
9.68 - 14.51
4.85 - 9.67
0.02 - 4.84
0.01
500 250 0 500 Meters
SHAMD-01SHAMD-02
SHAMD-03
SHAMD-05
SHAMD-06
SHAMD-04



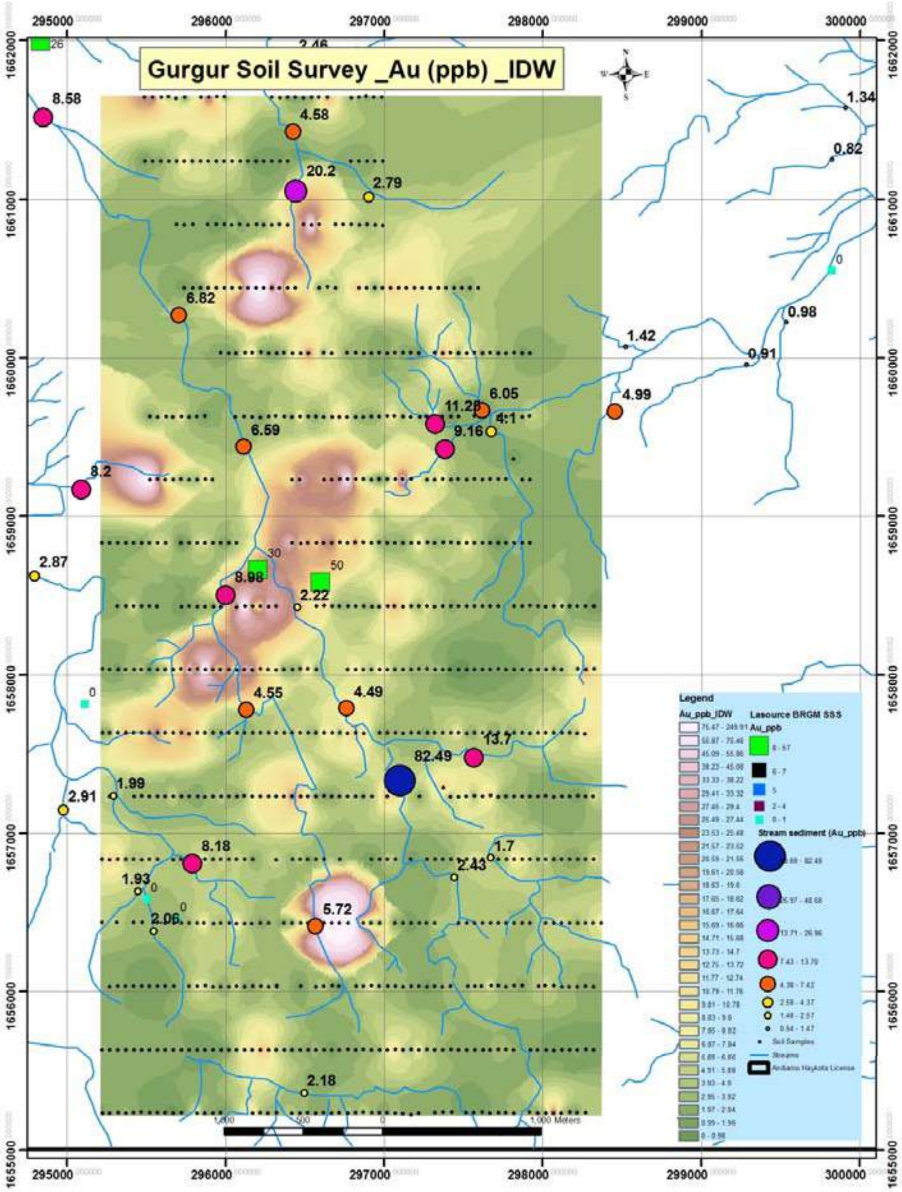
SHAMBOTAI DAIMOND DRILL SECTION
Shamd 1 and Shamd 2
Au (ppm)

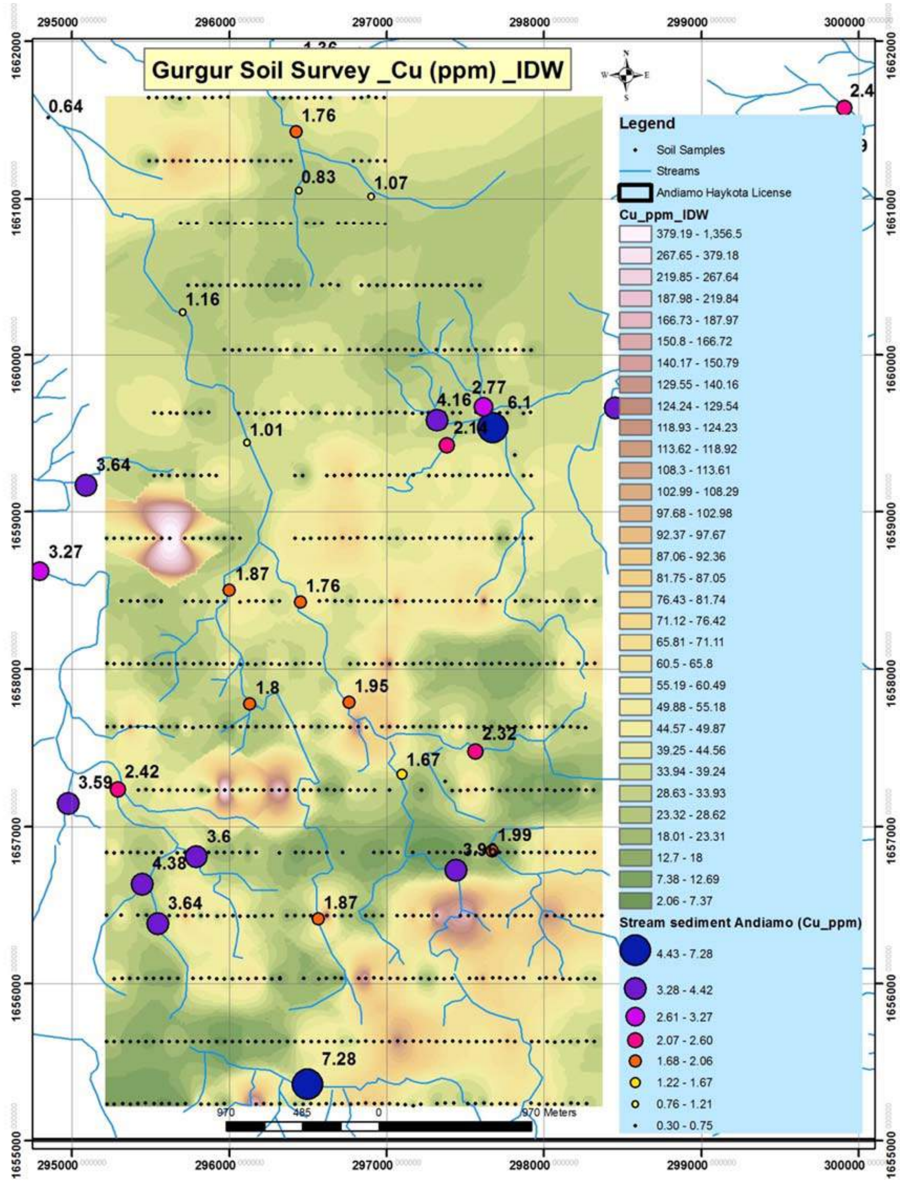


Shambotai Area

Initial drilling results showed disseminated gold of 36m@0.52g/t

Gurgur Shear Hosted Gold Prospect

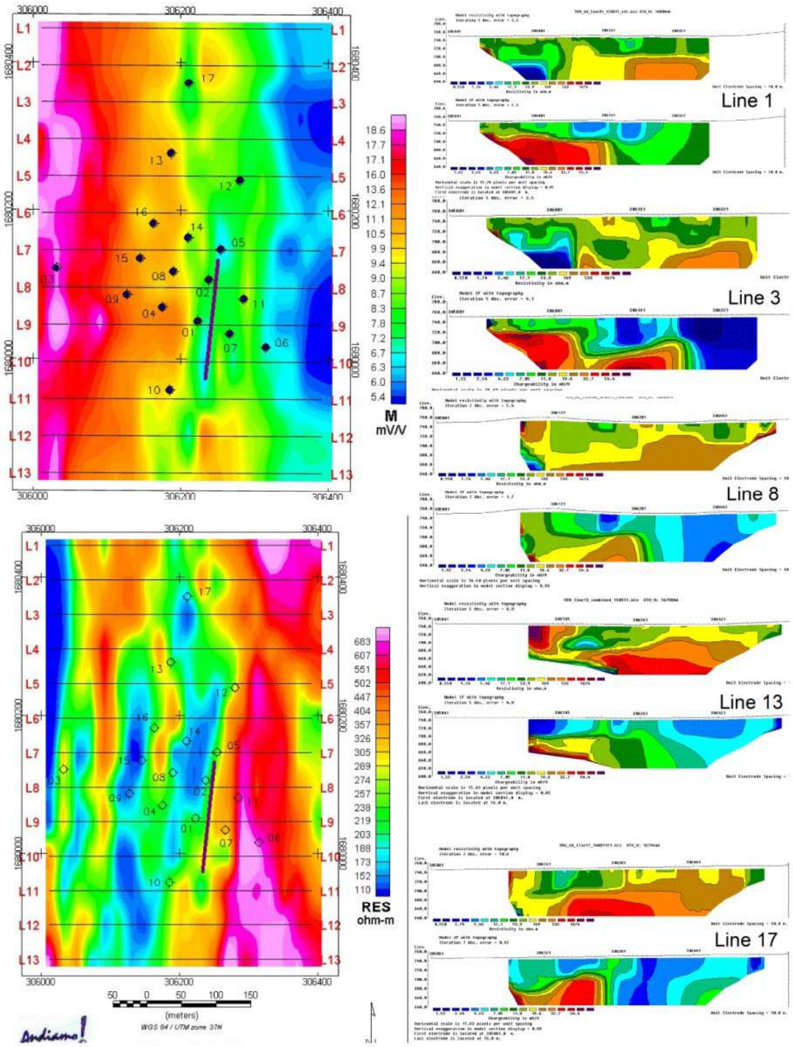


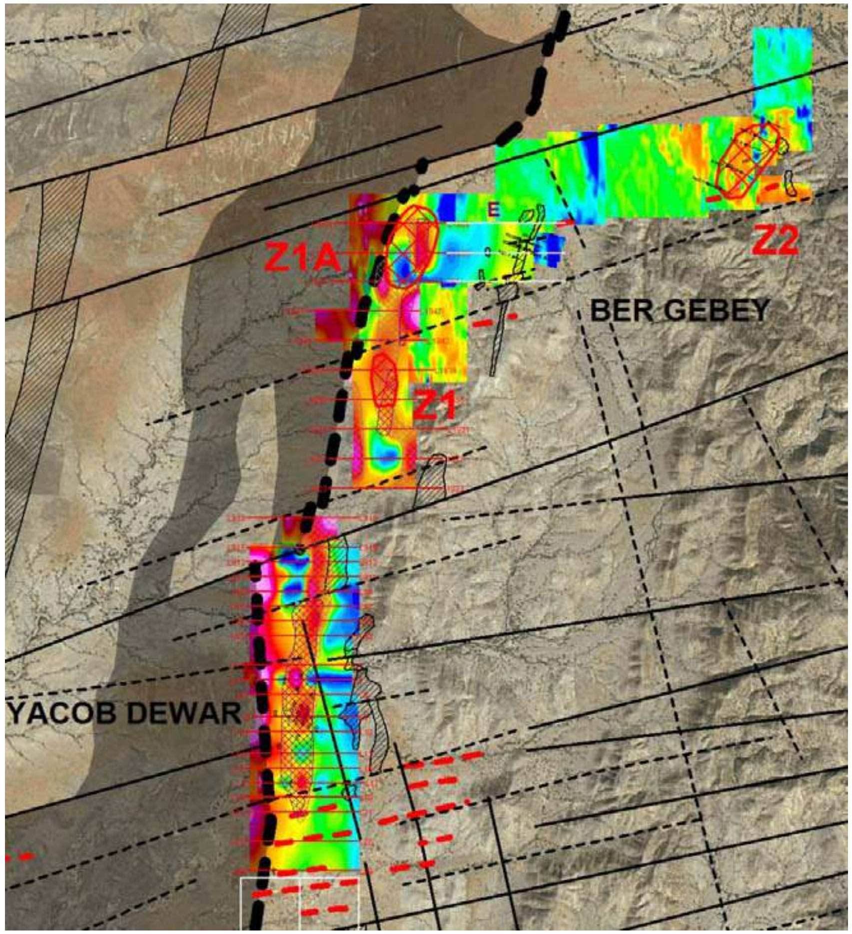


Yacob Dewar – Ber Gebey VMS Corridor

The Yacob Dewar Project is a VMS gold-copper exploration project, located in central Haykota area.

Induced Polarization (IP) Geophysical Survey at Yacob Dewar





The IP anomalous values correspond to the oxide Cu and Au zone

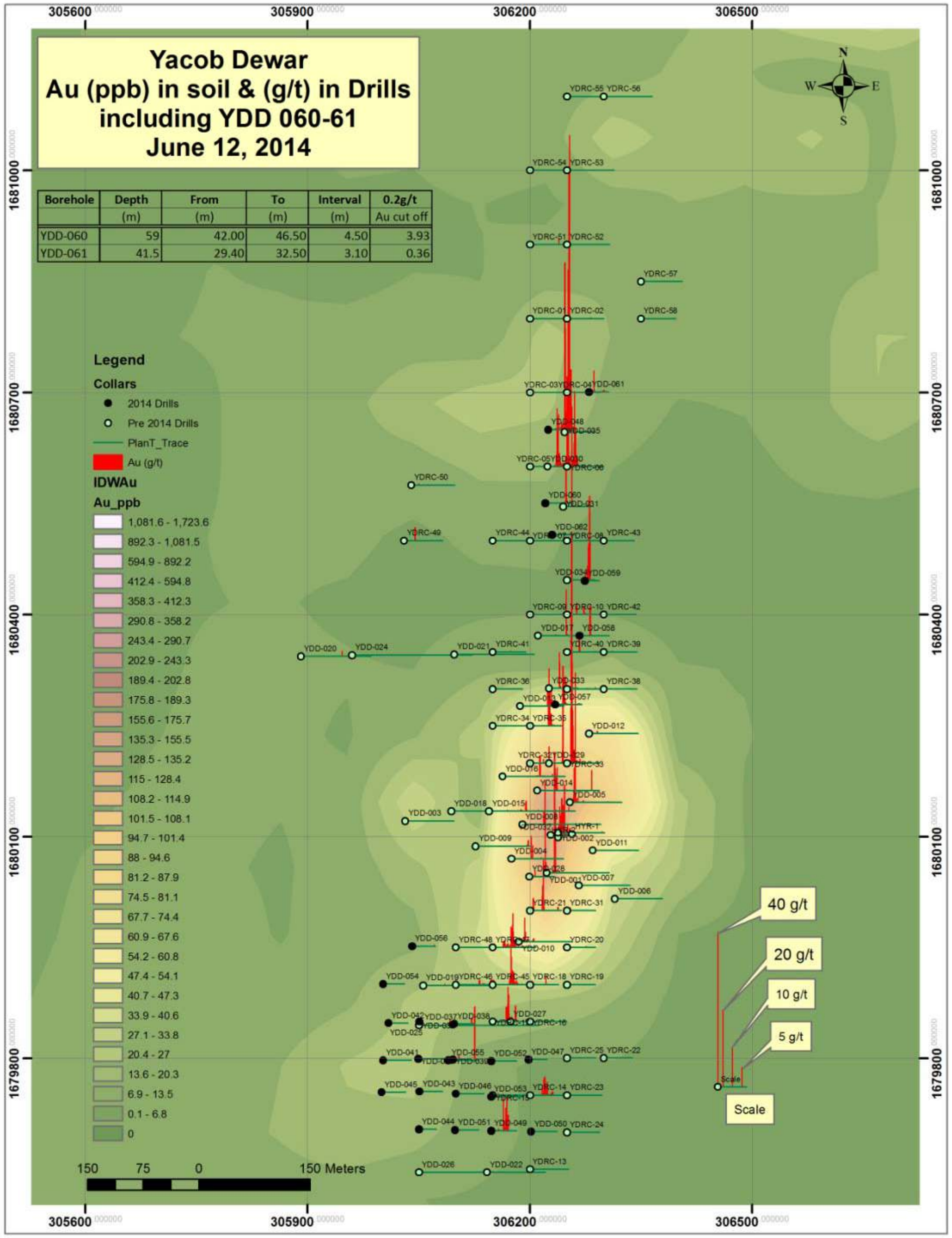
Diamond & RC Drilling at Yacob Dewar

- 2 Air core Drills (36m)
- 58 RC Drills (4475m)
- 62 diamond Drills (4782m)

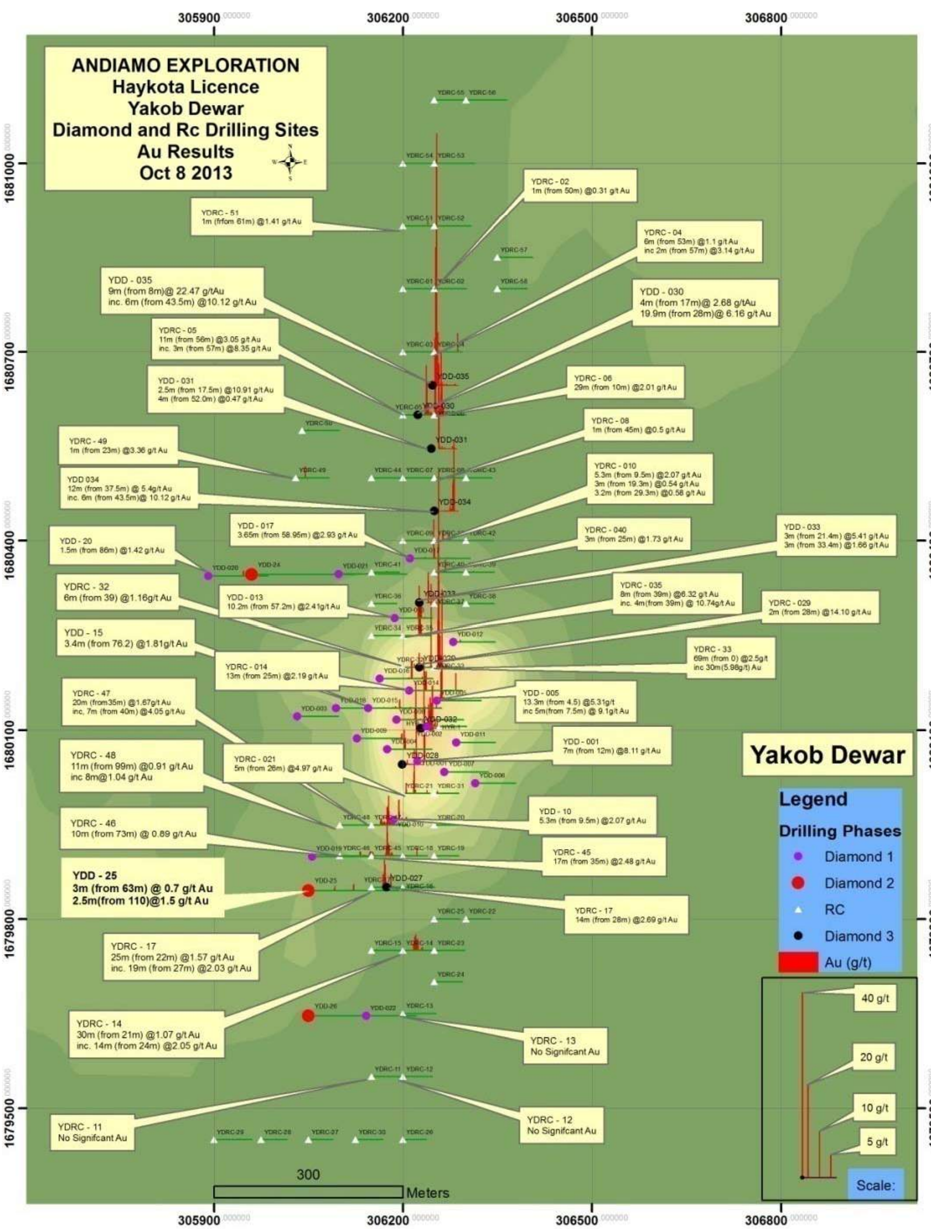
Trench In Yacob Dewar Gossan

2388 m trenches excavated at Yacob Dewar at a maximum depth of 6.3 meters

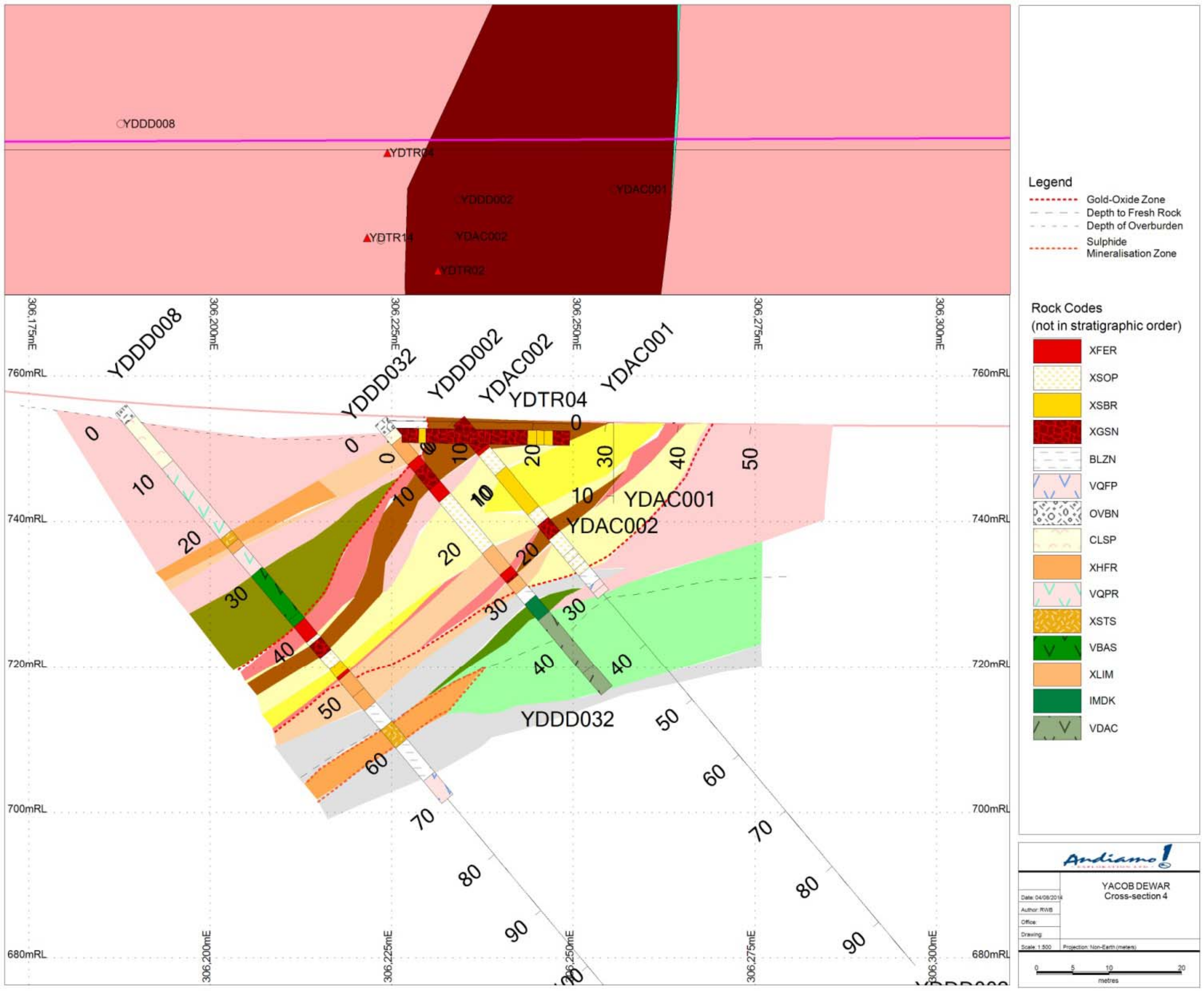
Yacob Dewar – Au and Cu Drill Results



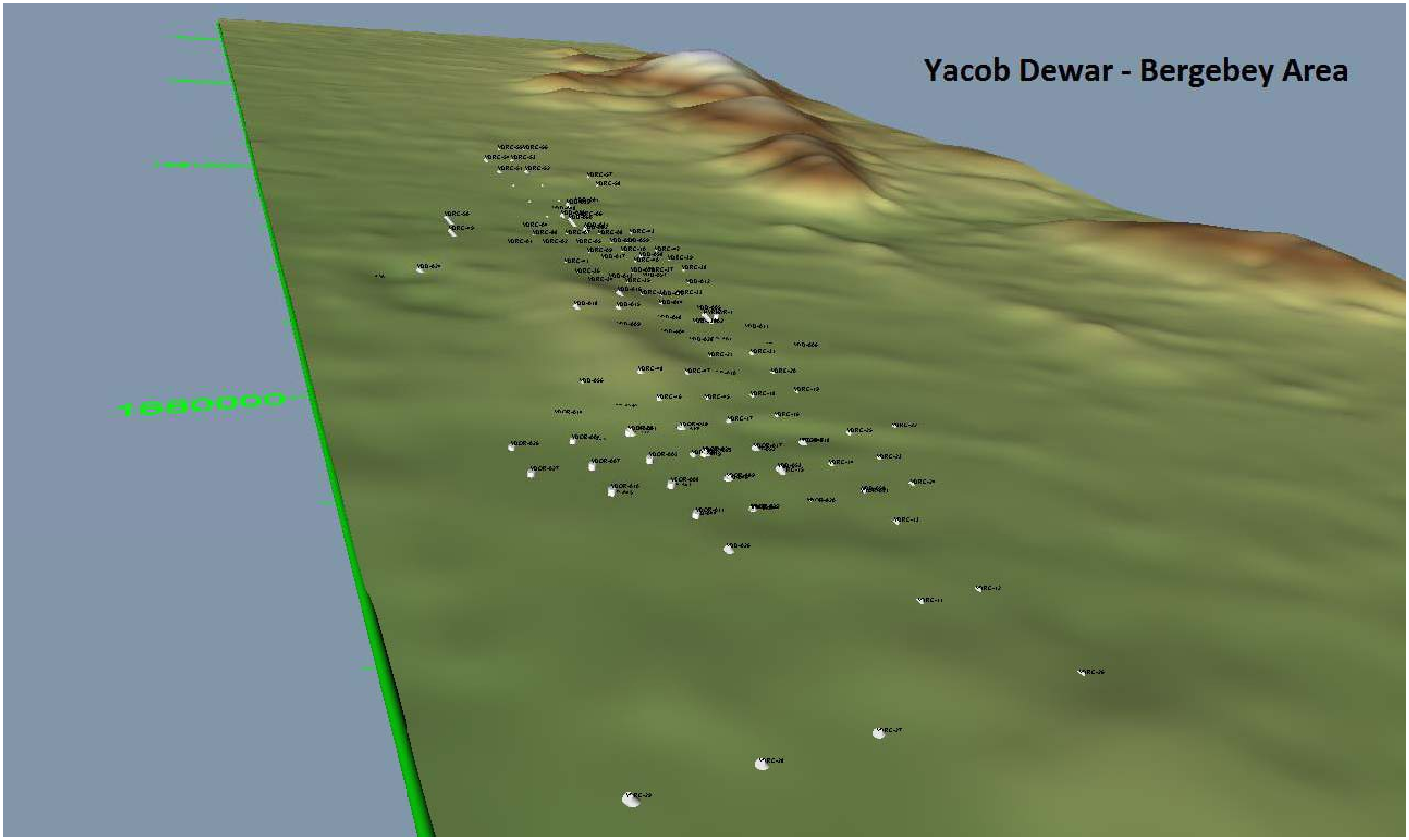
Borehole	Depth (m)	From (m)	To (m)	Interval (m)	0.2g/t Au cut off
YDD-060	59	42.00	46.50	4.50	3.93
YDD-061	41.5	29.40	32.50	3.10	0.36



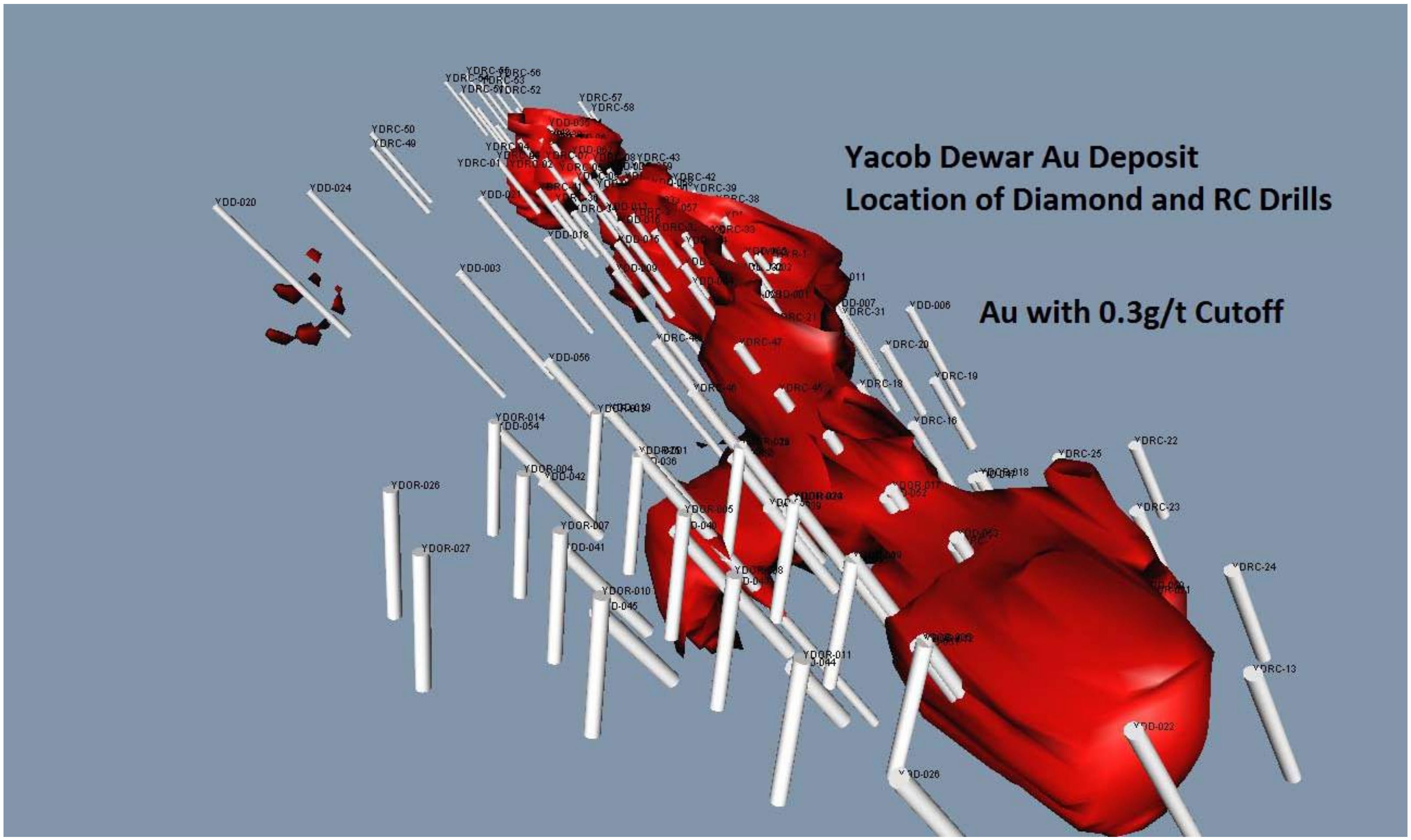
Representative Geologic Section Across the Yacob Dewar Au & Cu Deposit



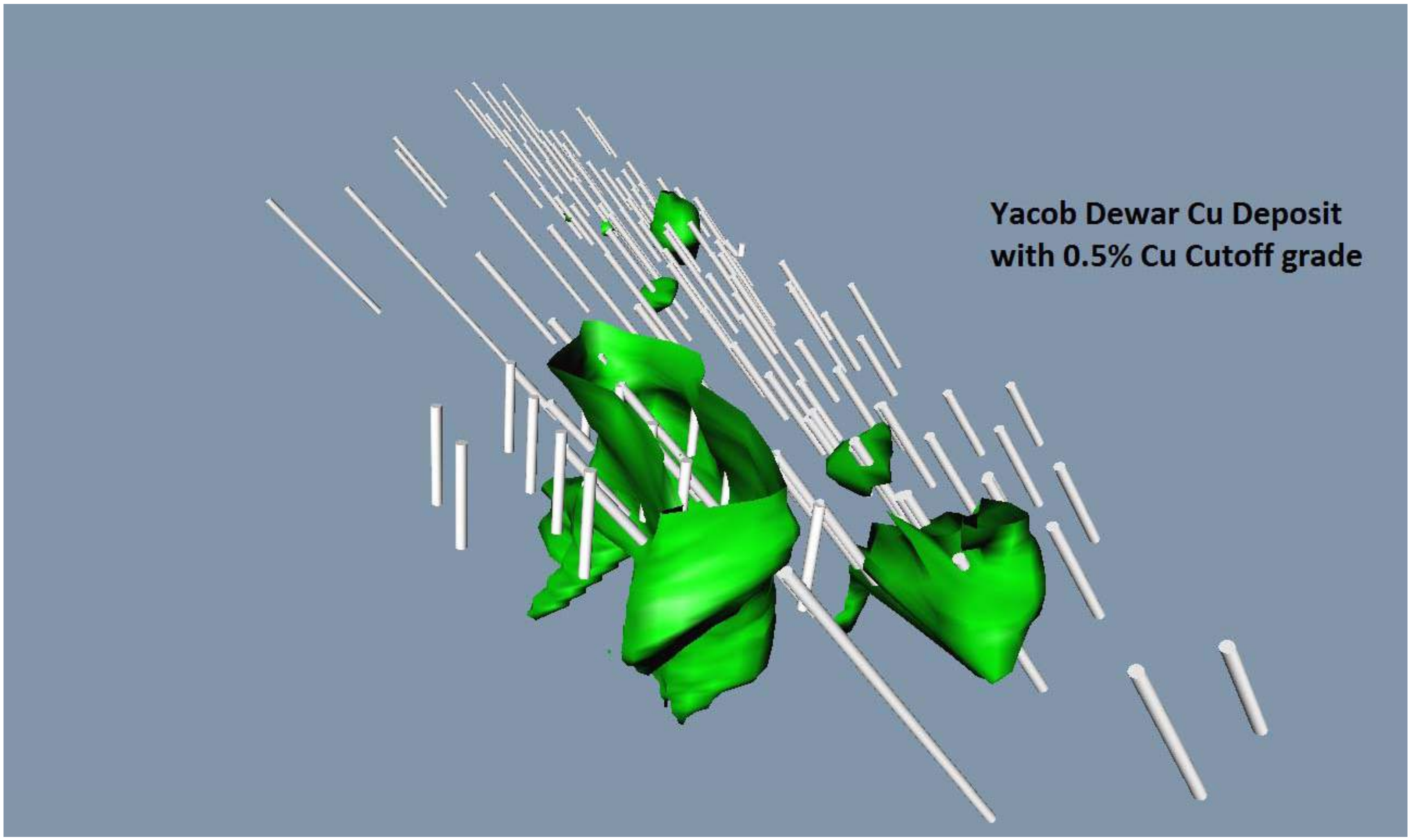
Yacob Dewar & Ber Gebey Drill Collars



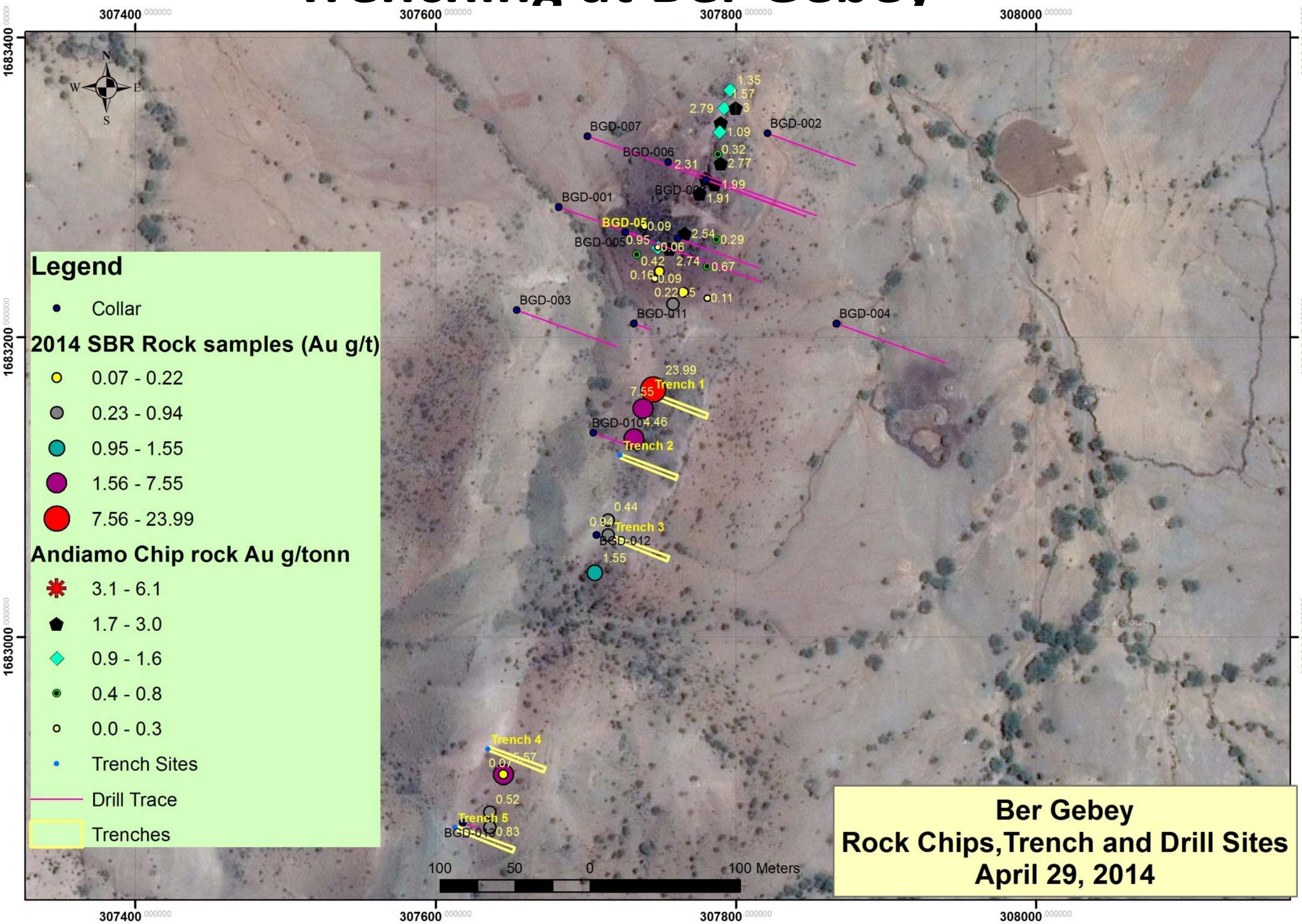
Resource Modelling of Yacob Dewar Au Deposit



Resource Modelling of Yacob Dewar Oxide Copper Deposit



Trenching at Ber Gebey



Ber Gebey – Gold Bearing Silica Barite Rock (SBR)

Baseline Social & Environmental Studies

The following baseline survey have so far being collected:

1. Land Use and Land Cover
2. Socio economic studies
3. Land ownership study of the Yacob Dewar area
4. Baseline data of artisanal miners in Haykota area
5. Vegetation baseline study
6. Wildlife baseline study
7. Water demand in the Haykota area
8. Hydrological study of the Haykota area
9. Soil survey of Yacob Dewar area
10. Livestock and
11. Baseline Health Survey

Corporate Strategy

1. Development of Yacob Dewar

- Surface gold deposit; open pit; high grade; simple processing
- Intention: to generate cash for copper/gold exploration
- Low capital costs; near term production; 55kms from Bisha
- Resource estimate
- A Technical and Economic Study ("TES") will be completed by 30 June 2015;

Corporate Strategy

2. Exploration for VMS in the Haykota Licence

- Target is multi million tonne massive sulphide Cu/Zn surface deposits
- Strong geophysics and geochemical evidence
- Drilling has already demonstrated mineralisation

Corporate Strategy

3. Exploration for shear hosted gold in Haykota Licence Area

- Target is multi million ounce gold deposits at surface
- Extensive artisan mining activity in Shambotai Gurgur: both valleys and veins
- Drilling has already demonstrated mineralisation

Teamwork

MANAGEM

Exploration activities in Sudan

Over 80 years of success in mining development

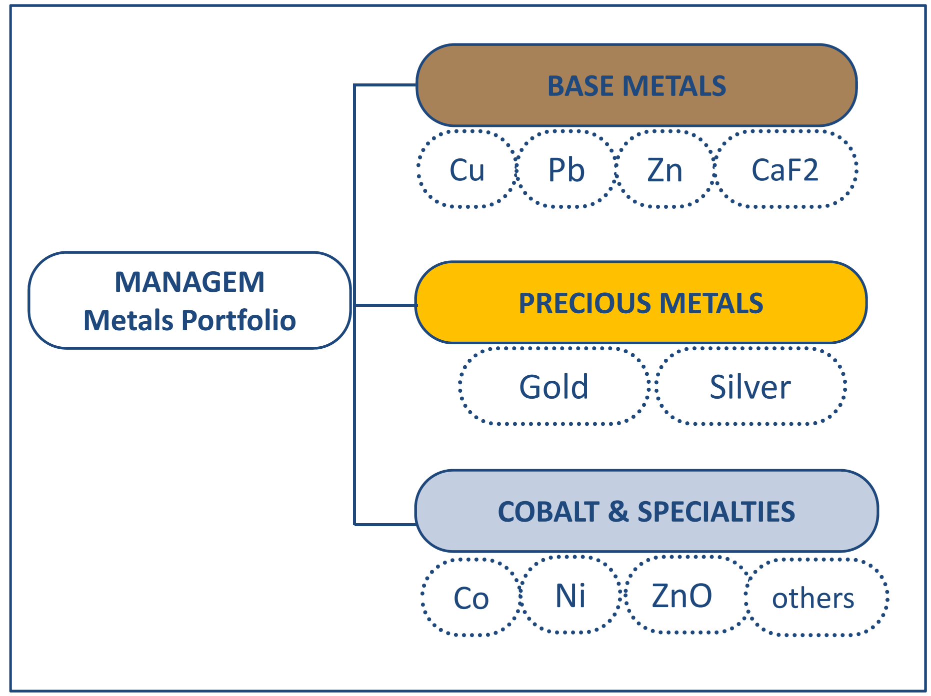
Company profile

→ MANAGEM is an international diversified mining company.

→ A major player in the Moroccan mining sector since 1928.

→ Listed on the Casablanca stock exchange.

→ More than 10 years operations in Africa.

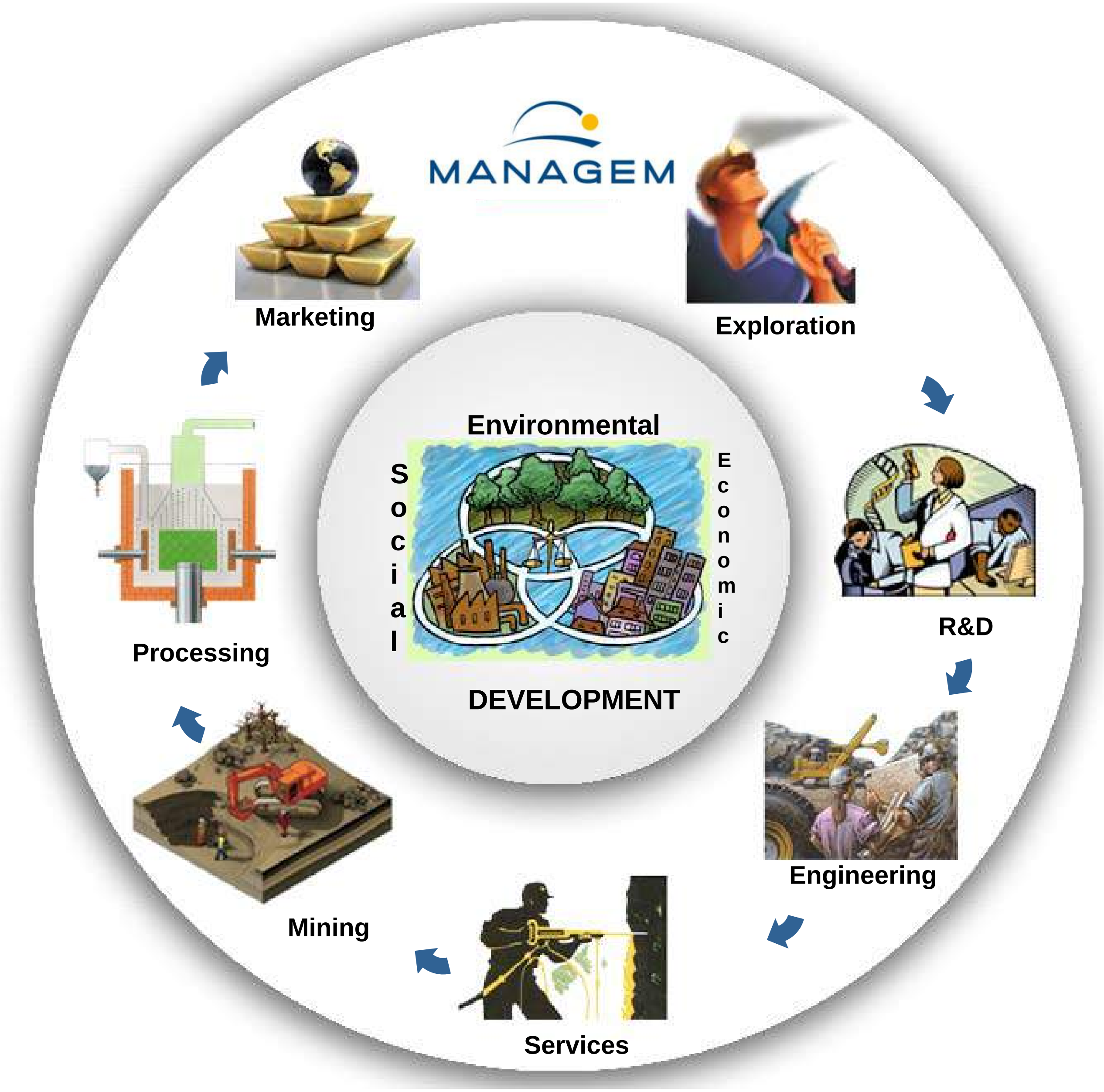


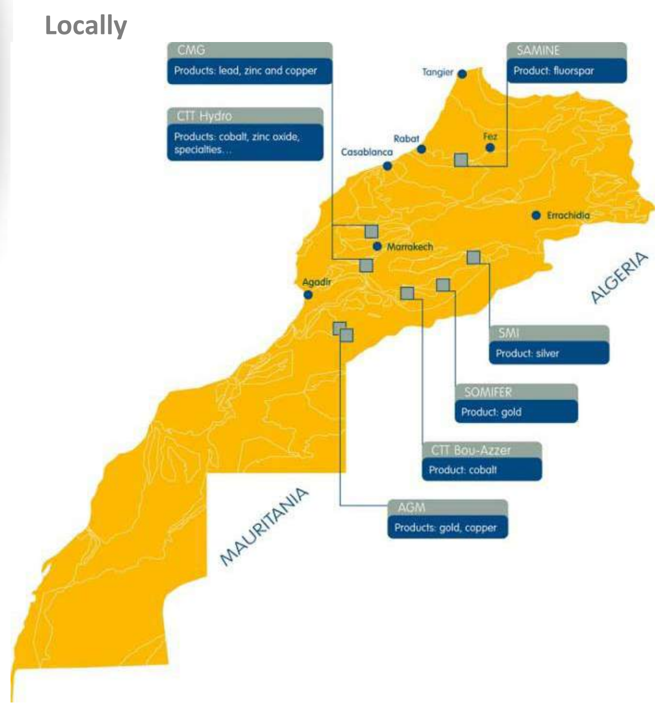
20 Industrial sites

50 Scientists
14 Processing Methods
7 Patents

4 500 employees in
more than 5 countries

Fully integrated mining group



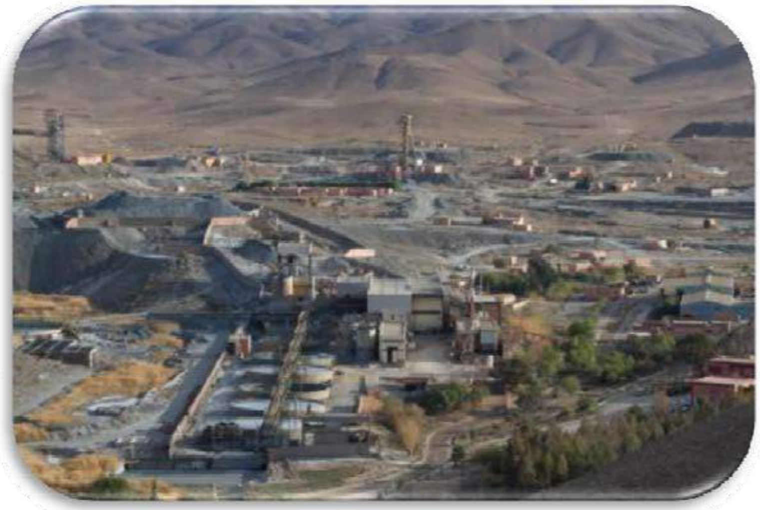


Precious Metals

Imiter silver mine

Imiter mine is located 150 km East of Ouarzazate. Operated by SMI, Imiter mine is one of the leading silver mines worldwide producing up to 7 million ounces per year of high purity silver ingots. It started operations in 1969. The mine owns important reserves estimated at more than 100 million ounces of silver metal.

10 year investments: MAD940 million
Number of employees: 580



Bakoudou gold mine

The Bakoudou gold mine is located 90 km far from Mouanda in Gabon. Operated by REG, the mine started production early in 2012.

Production capacity : 45 000 oz of gold per annum
Investment : US$50 million
Number of employees : 150

Base Metals

CMG polymetallic mines

CMG currently owns and operates zinc lead copper polymetallic ore bodies located in the region of Jbilet in Marrakech, namely Hajjar, Draa Sfar and Tighardine.

Annual capacity :
85 000 tons of zinc concentrates / 20 000 tons of lead concentrates / 15 000 tons of copper concentrates.
Cumulated investments : MAD2,400 million
Number of employees: 1 140

Akka gold and copper mines

Located 280 km south east of Agadir, AGM mines the Iourirn gold bearing deposit since 2001. AGM operation produces also copper concentrates since 2007.

Annual capacity : Gold 23,000 oz – Copper 25,000 tons of concentrates
Investments : MAD2,200 million
Number of employees : 600

Cobalt & Specialties

Bou-azzer cobalt mine

Located 120 km south of Ouarzazate, Bou Azzer is the Group's oldest property (1928). Operated by CTT, the Bou azzer mine produces cobalt concentrates and hydroxides.

Annual capacity : 2 000 tons of cobalt

Guemassa hydrometallurgical operations

The Guemassa site is based 30 km far from Marrakech.
Since 1996, CTT runs hydrometallurgical operations, derived from R&D efforts, to produce high added value products such as : cobalt cathodes, cobalt hydroxide, nickel sulfate, arsenic trioxide, zinc oxide, copper sulfate, …

10 year investments : MAD2 billion
Number of employees : 1 600

Fluorspar

El Hammam fluorspar mine

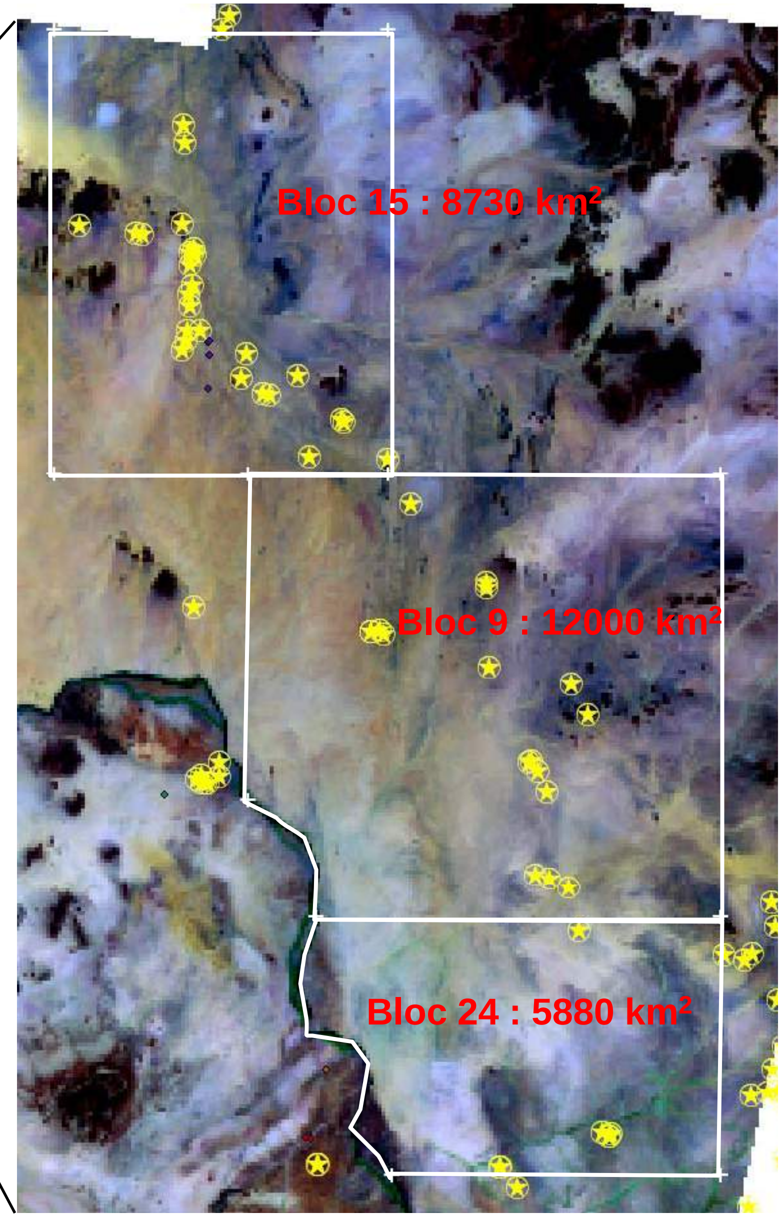
Located 63 km from Meknès, El Hammam mine is operated by SAMINE since 1974 and produces high quality fluorspar.

Annual capacity : 100 000 tons of fluorspar acid grade

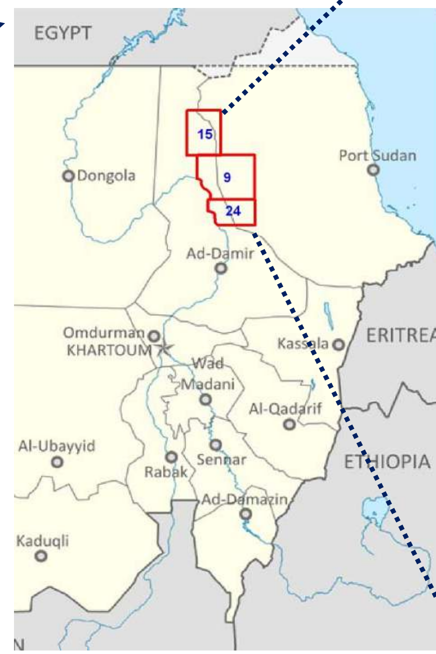
10 year investments : MAD 400 million

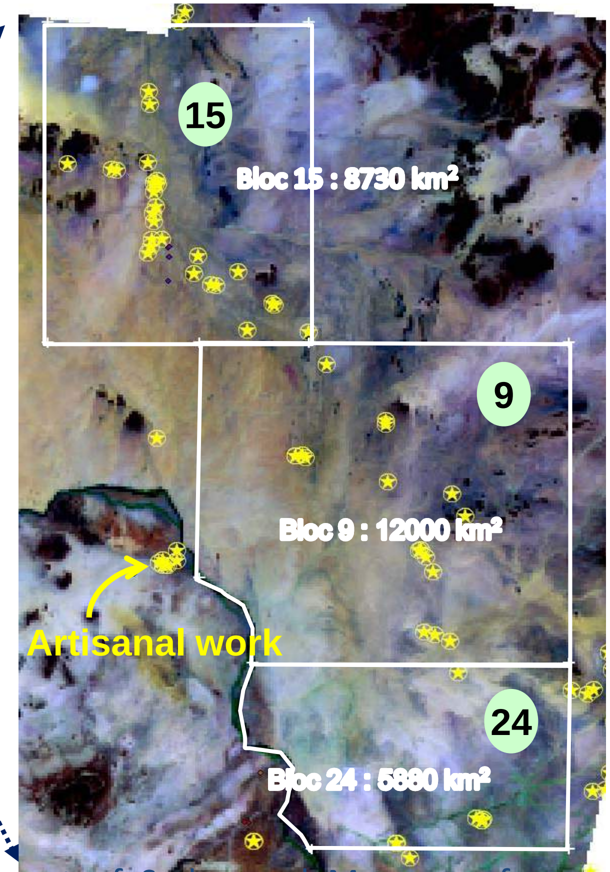
Number of employees : 310

Mangem: Our operation in Africa: Example of Sudan



Our presence in Sudan: Since 2008





Block 15
covering an area totaling 8,730 Km² in Northern Soudan

Block 9
covering an area of 12,000 Km² in the South of Block 15

Block 24
covering an area of 5,880 Km² in the South of Block9

→ **September 2008:** Agreement between the Government of Sudan and Managem for Blocks 15 & 24 exploration licenses

→ **Year 2009:** Exploration activity startup in Block 15

→ **Year 2010:** Establishment of MCM company, Managem's subsidiary in Sudan

→ **Year 2011:** JV company with HCMC for Block 9 Exploration license

→ **Year 2012-2013 :** Resources certification and BFS of Block 15 Gabgaba Project

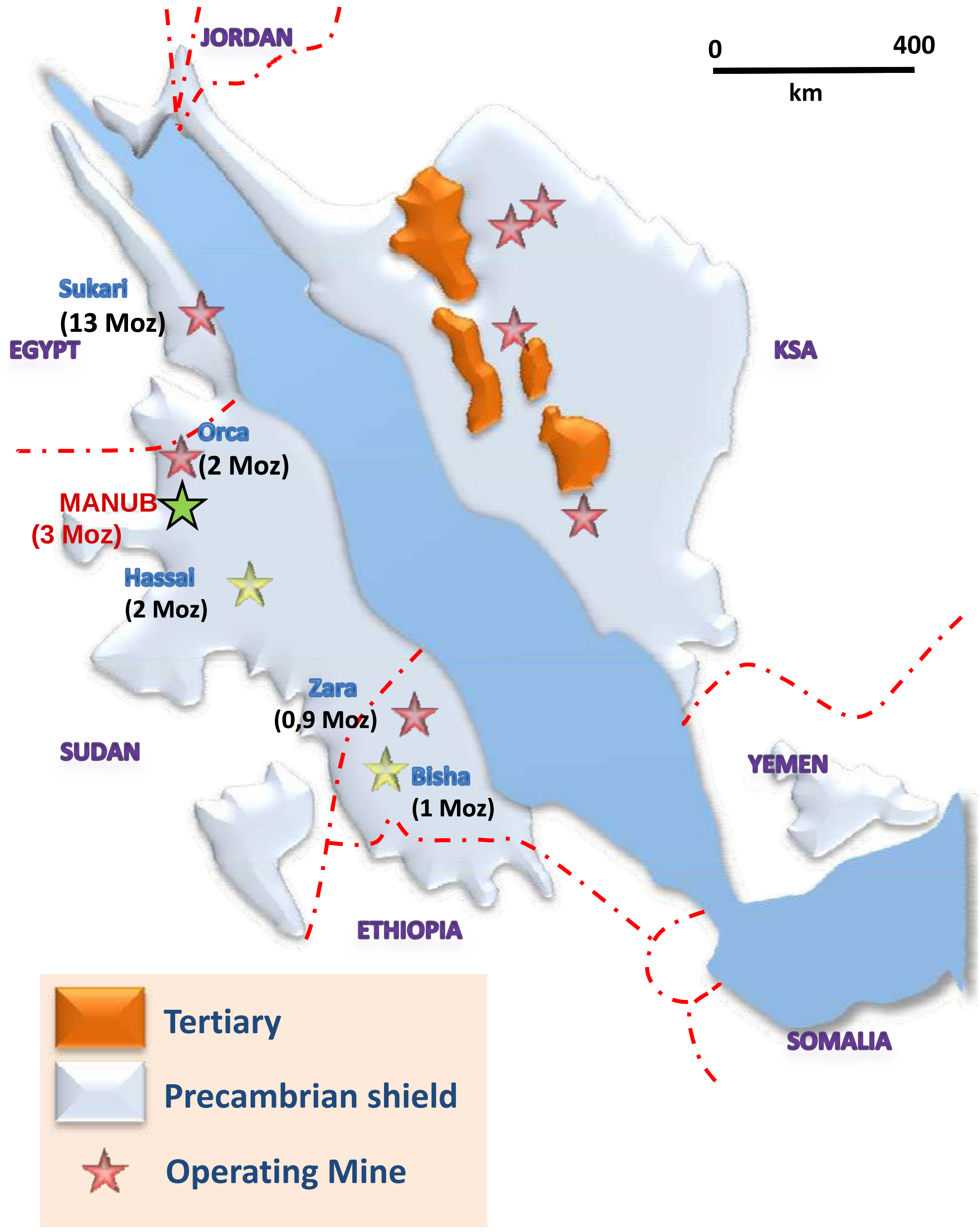
Why to explore in the Nubian Shield?

The Arabian-Nubian Shield (ANS):
A favorable geological context for gold exploration

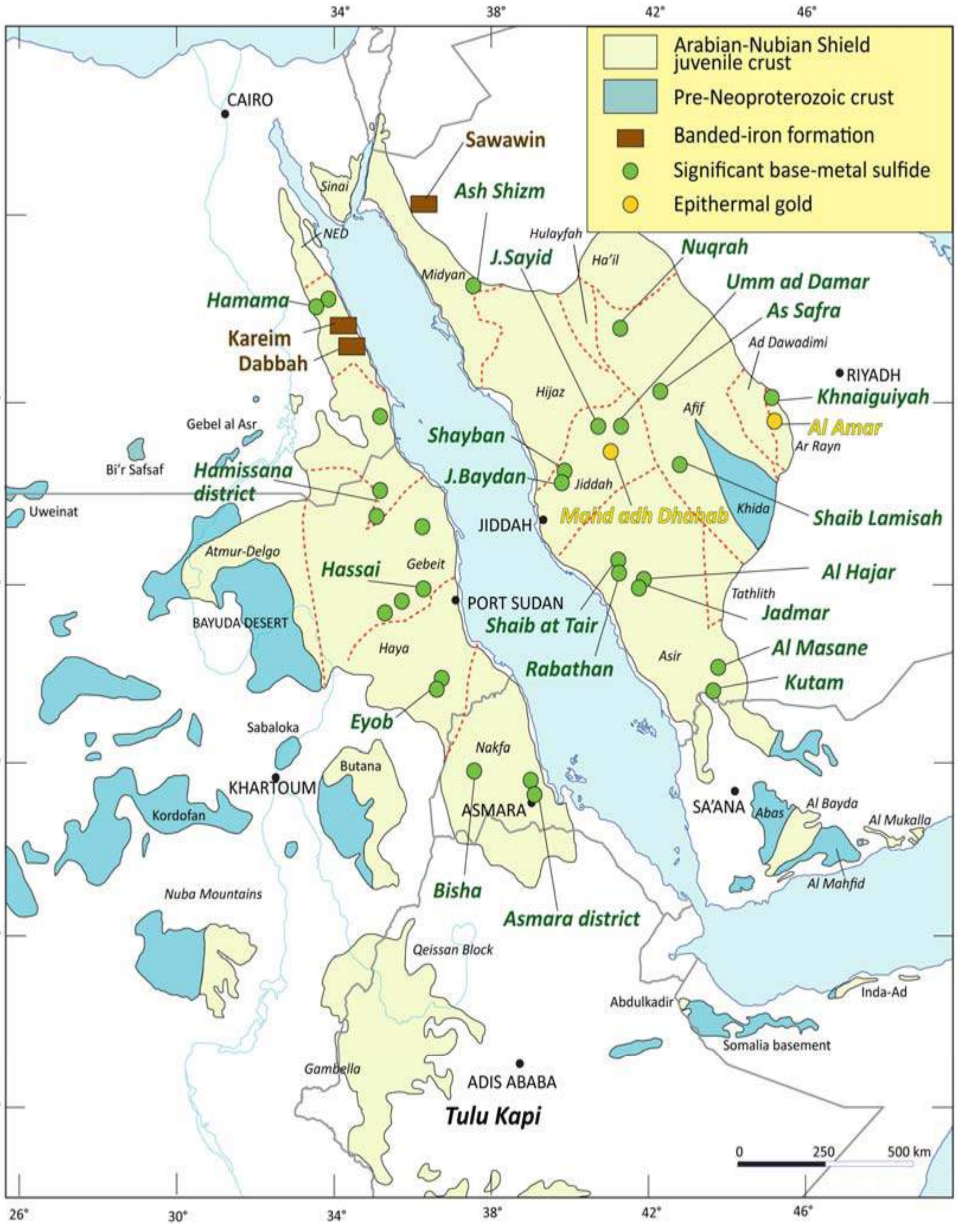
→ Gold deposits dating back to ancient times

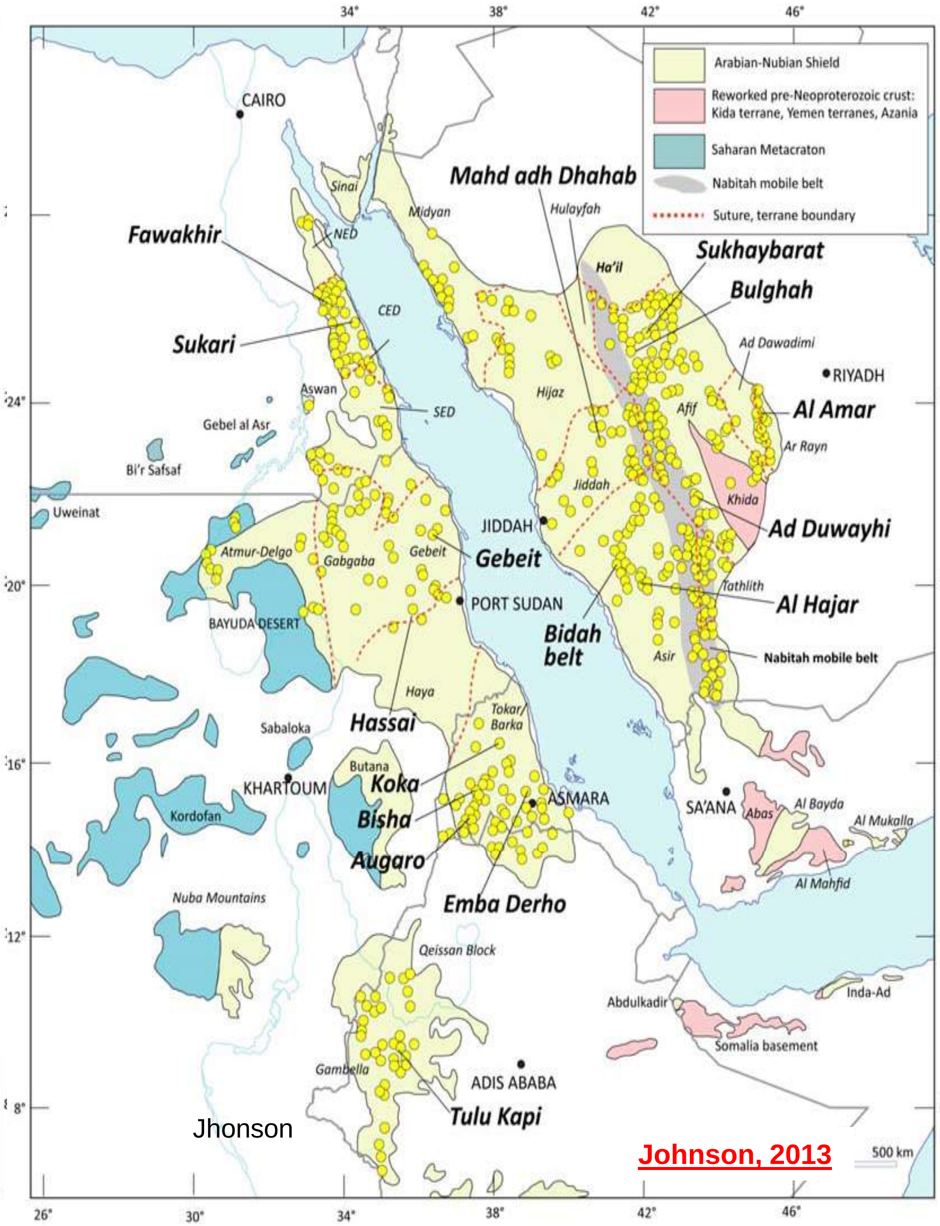
→ Fundamentally fertile belt with variety of deposit styles (orogenic, VMS, epithermal porphyry)

→ Unexplored in modern time



Base metal – Epithermal gold – Orogenic gold deposit

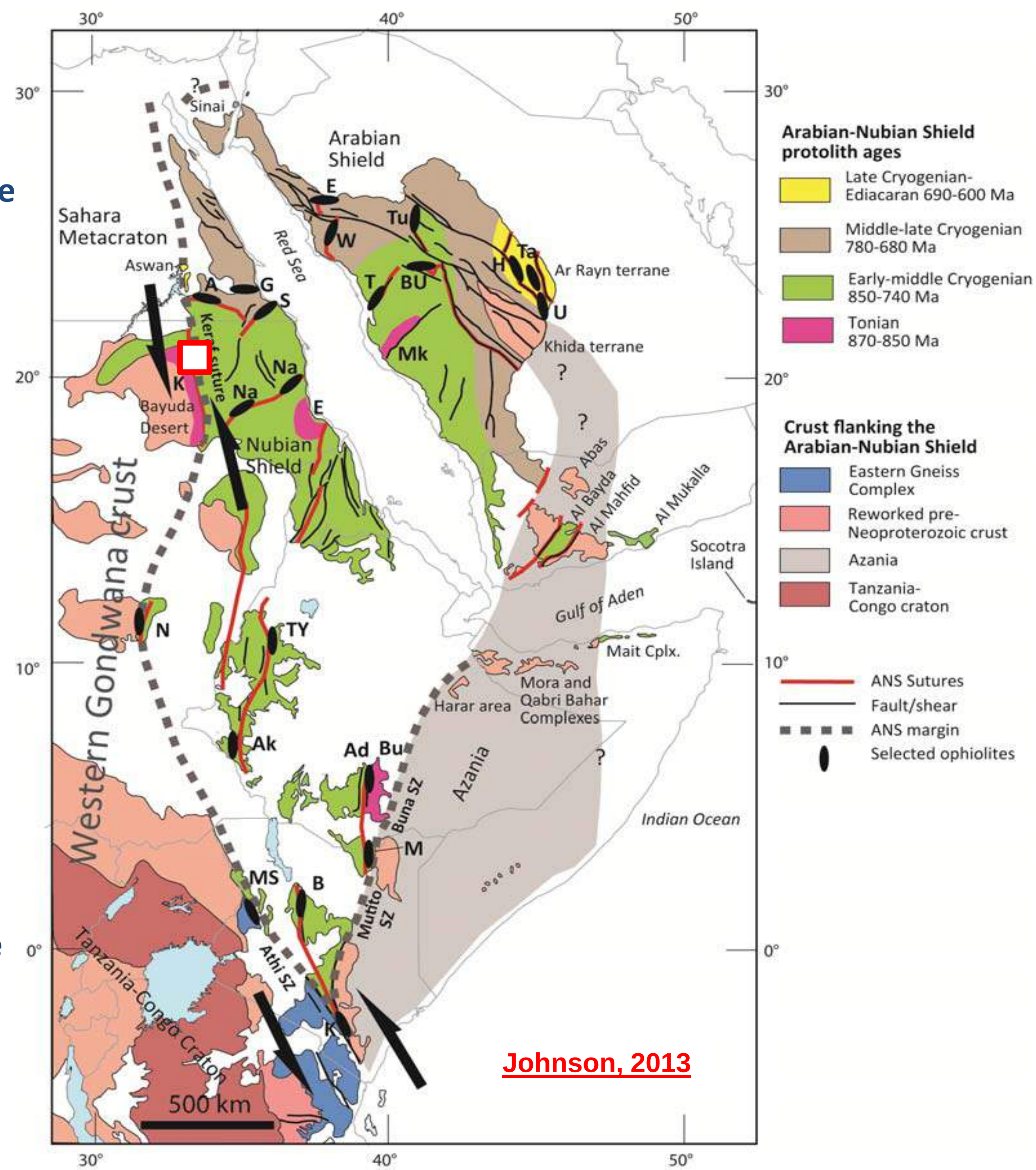




Johnson, 2013

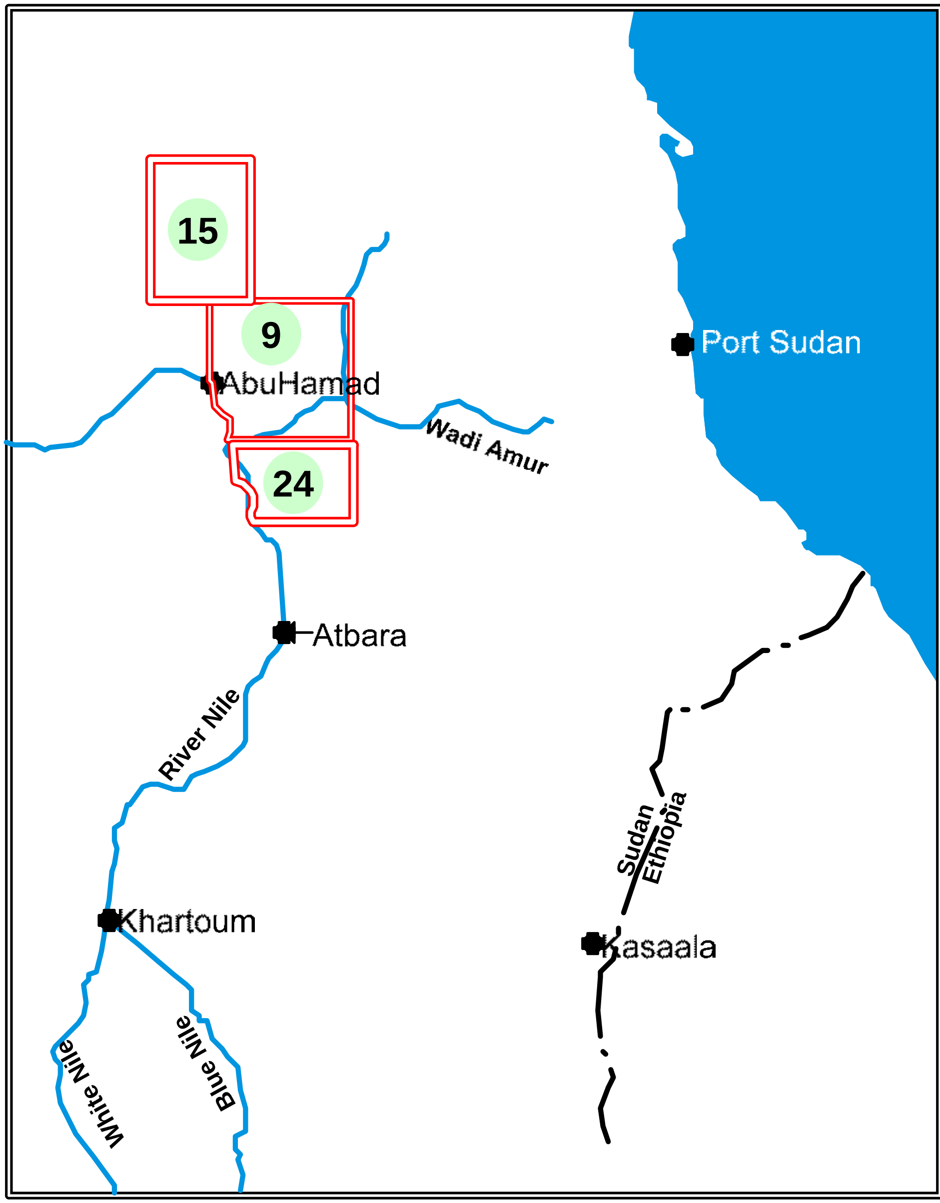
ANS – Fundamental favorable geologic features

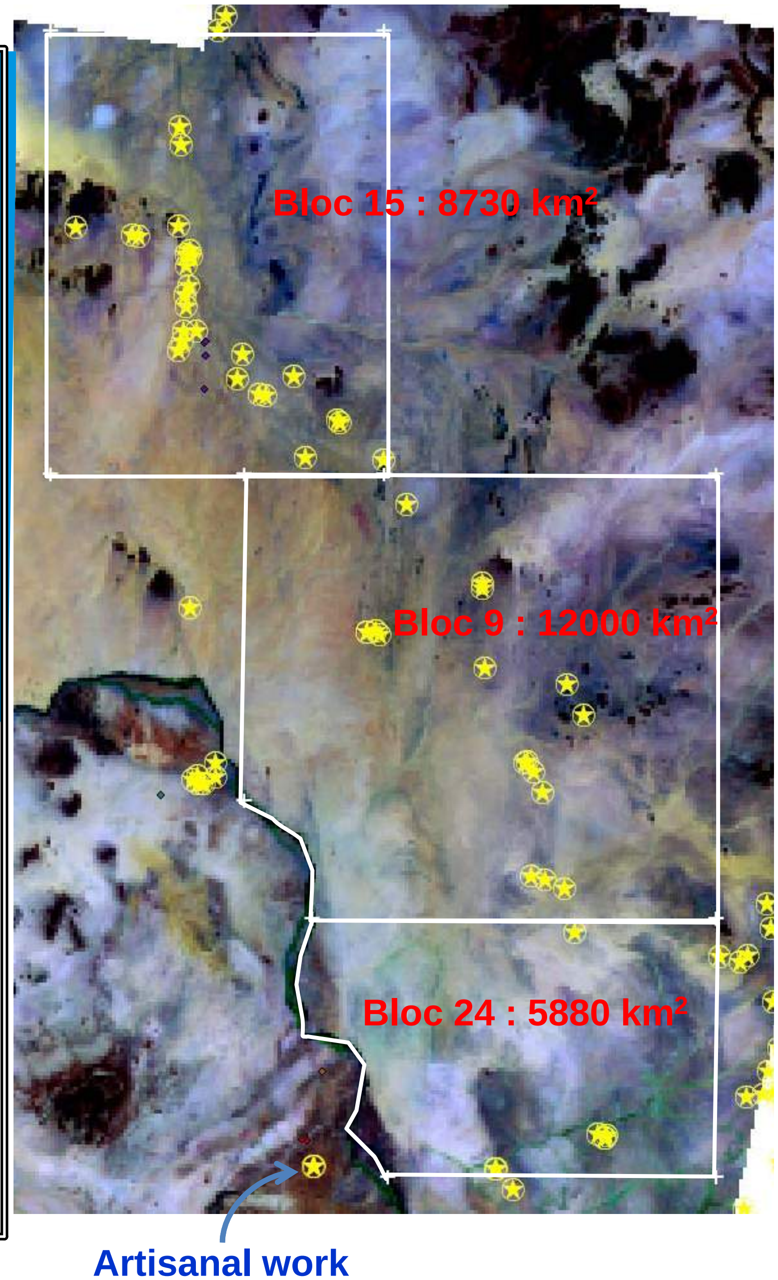
- Juvenil crust – material newly extarcted from the mantle
- Oceanic setting – tectonic evolution from oceanic crust to continental crust
- Multiple active margins – subduction zones, island arcs in a large ocean basin
- Enormous magmatic activity – emplacement of vast amounts of mafic and felsic magma elevated heat flow , driver of hydrothermal activity
- Transpressive deformation – compression, extension, shearing, thrusting, creation of space



Johnson, 2013

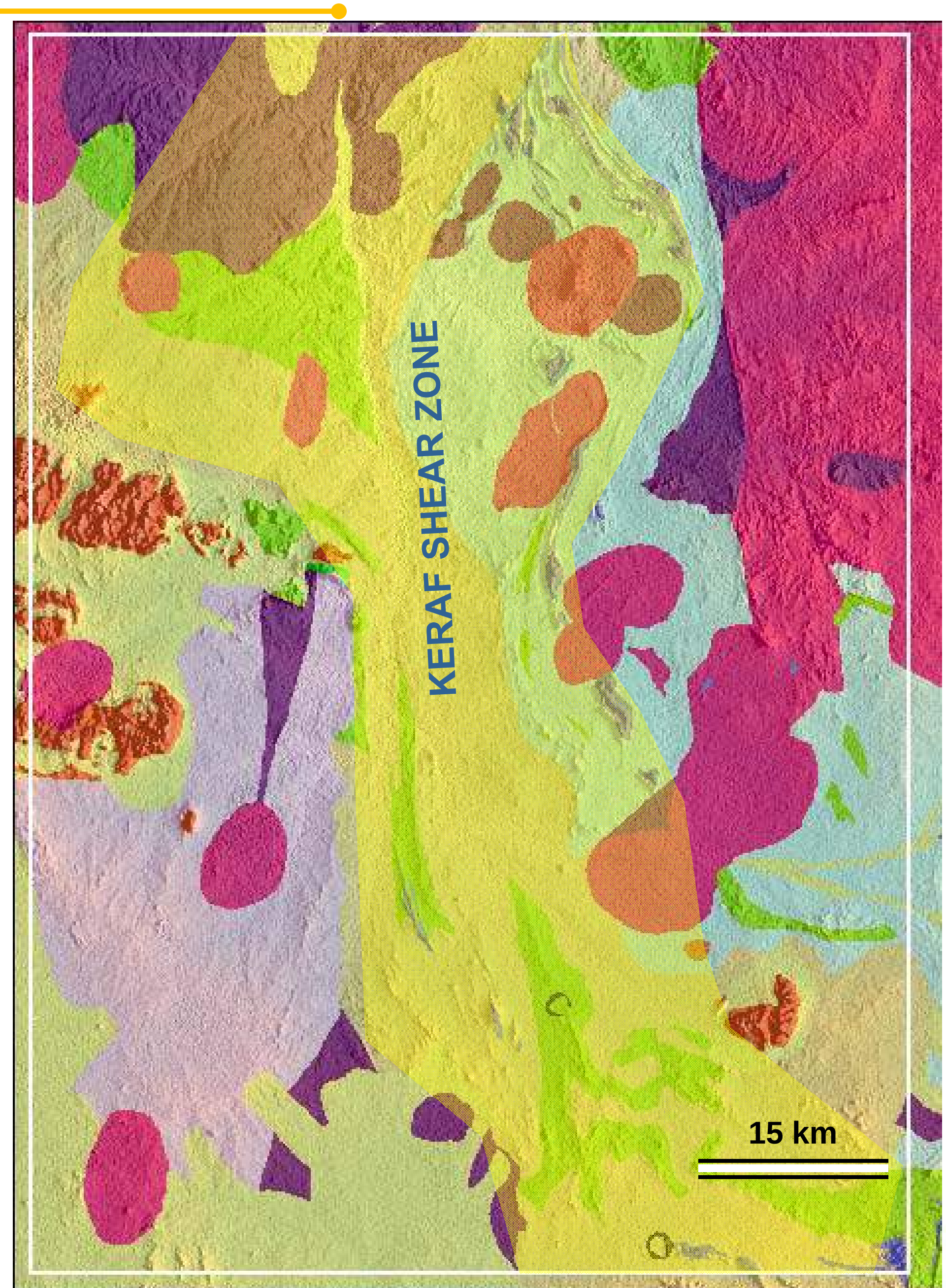
Soudan : MANAGEM hold 26 610 km2 of gold exploration project





Sudan : Geological features of the concession areas

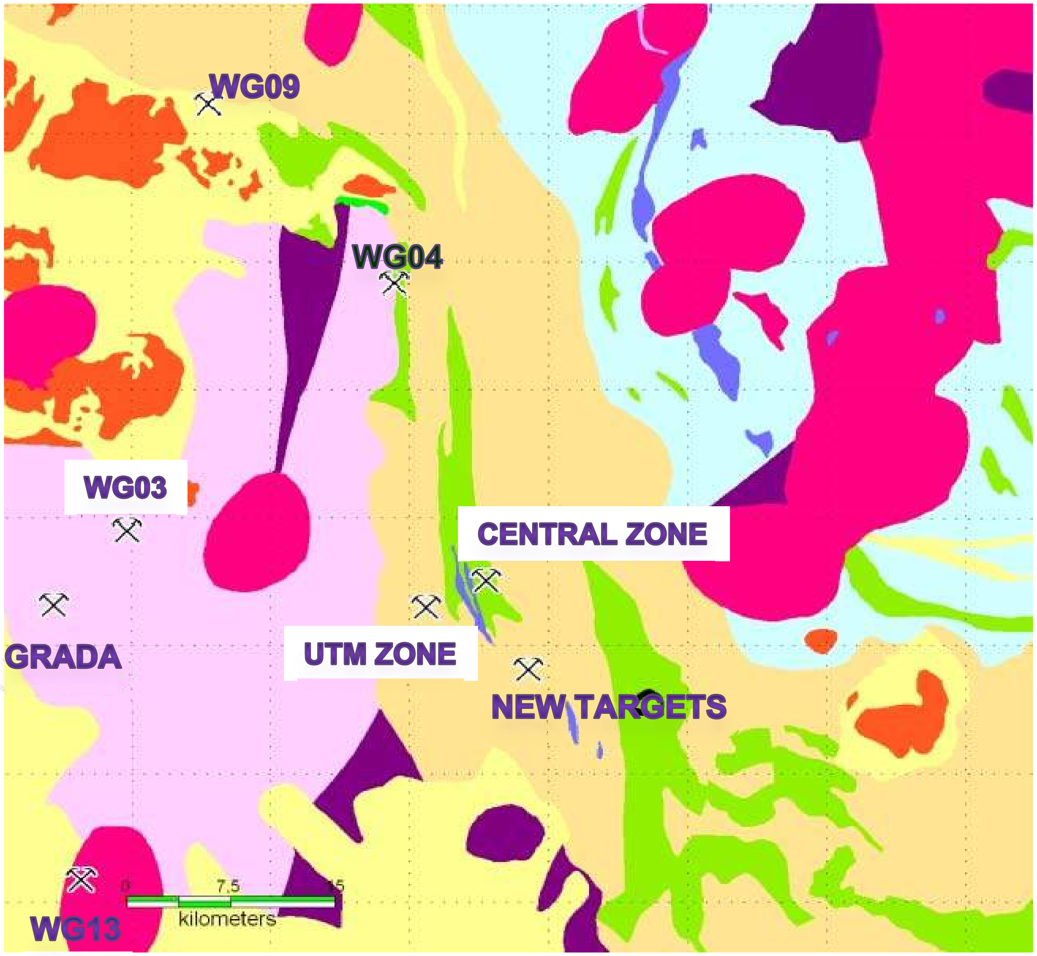
- Rock units having Panafrican age: meta-volcanic sedimentary rocks of Green schist facies intruded by plutonic rocks
- All the rocks are affected by the NS shear zone: Keraf shear zone
- Tertiary intrusive and extrusive igneous rocks
- Mineralization restricted to NS tending quartz veins and alteration zones hosted by felsic dykes



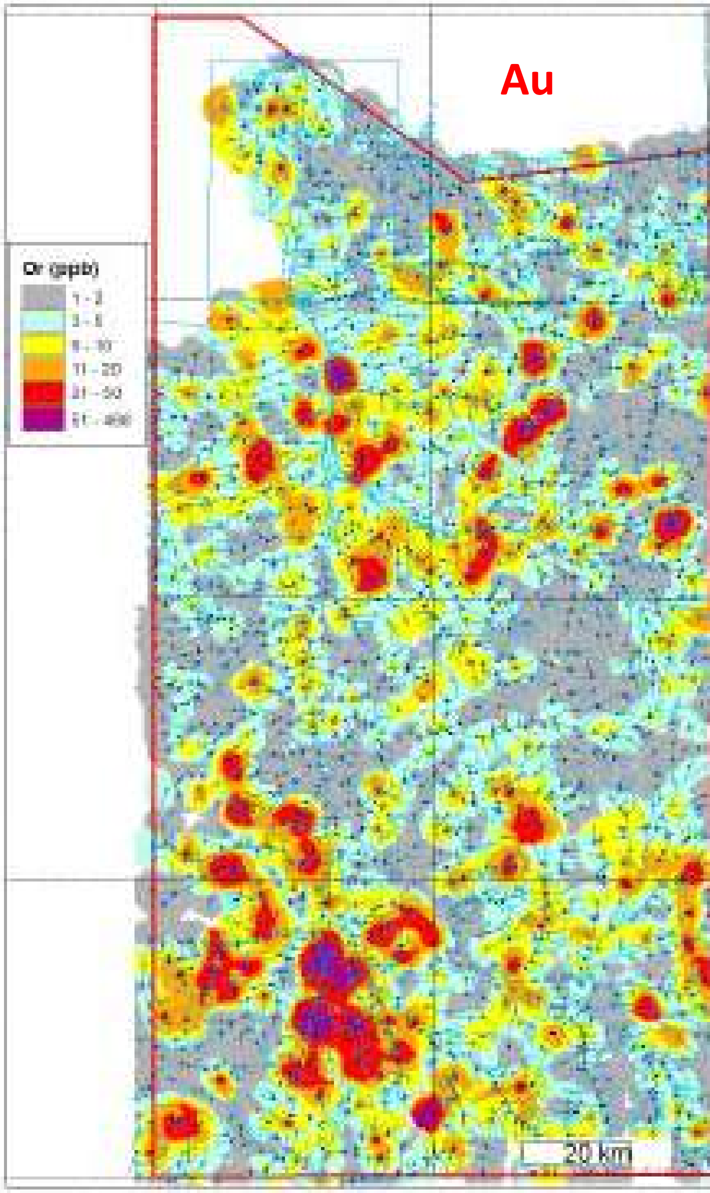
Exploration works conducted in Sudan

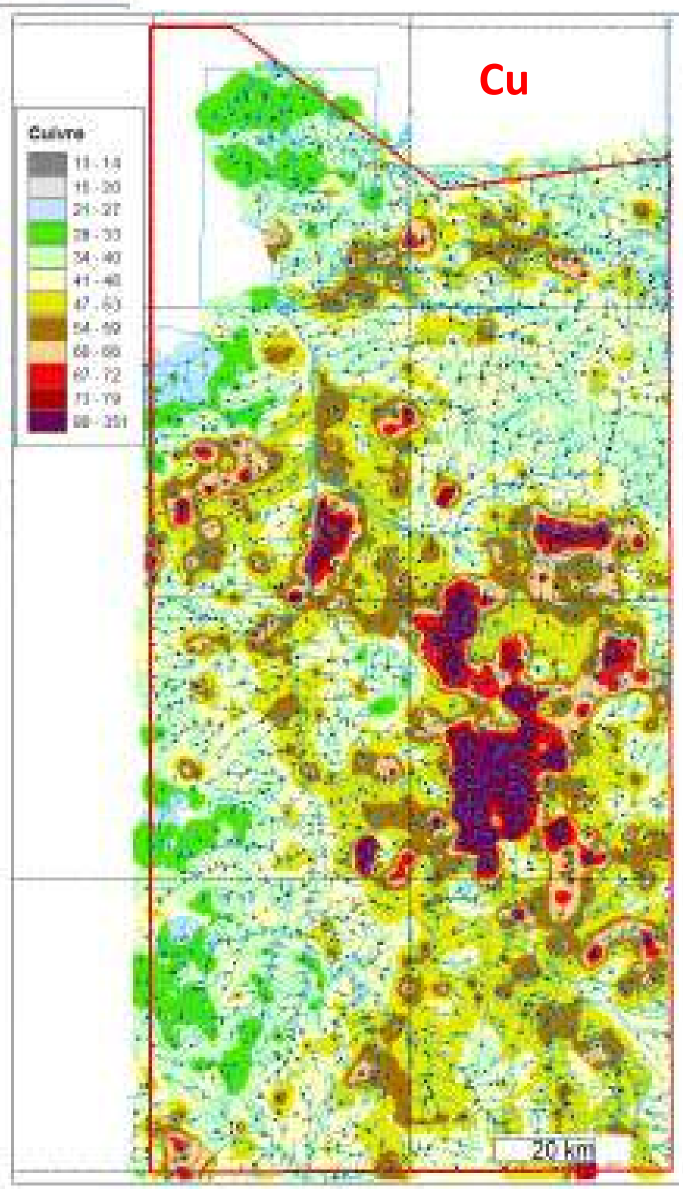
Block 15

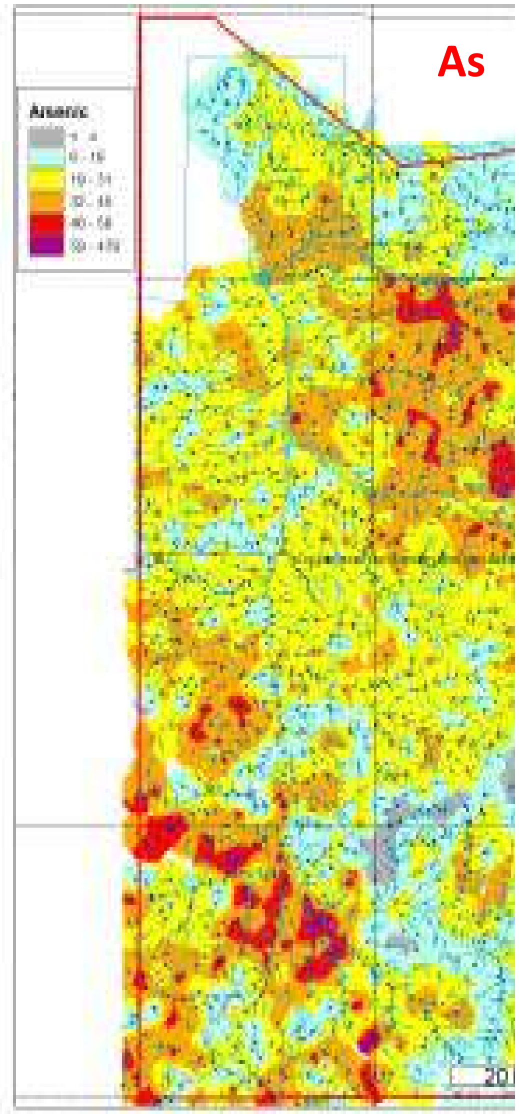
- Remote sensing: satellite interpretation and hyperspectral
- Stream Sediments (BRGM)
- Soil geochemistry (BRGM)
- Generation of numerous targets for field checking
- Geological mapping and sampling in some focusing areas
- Trenching : **27 000 m**
- Drilling program: **195 000m**
- **Topographic survey of the target Areas**
- Best deposits to date:
  - UTM Zone
  - Central Zone (C04 & C02)
  - WG03



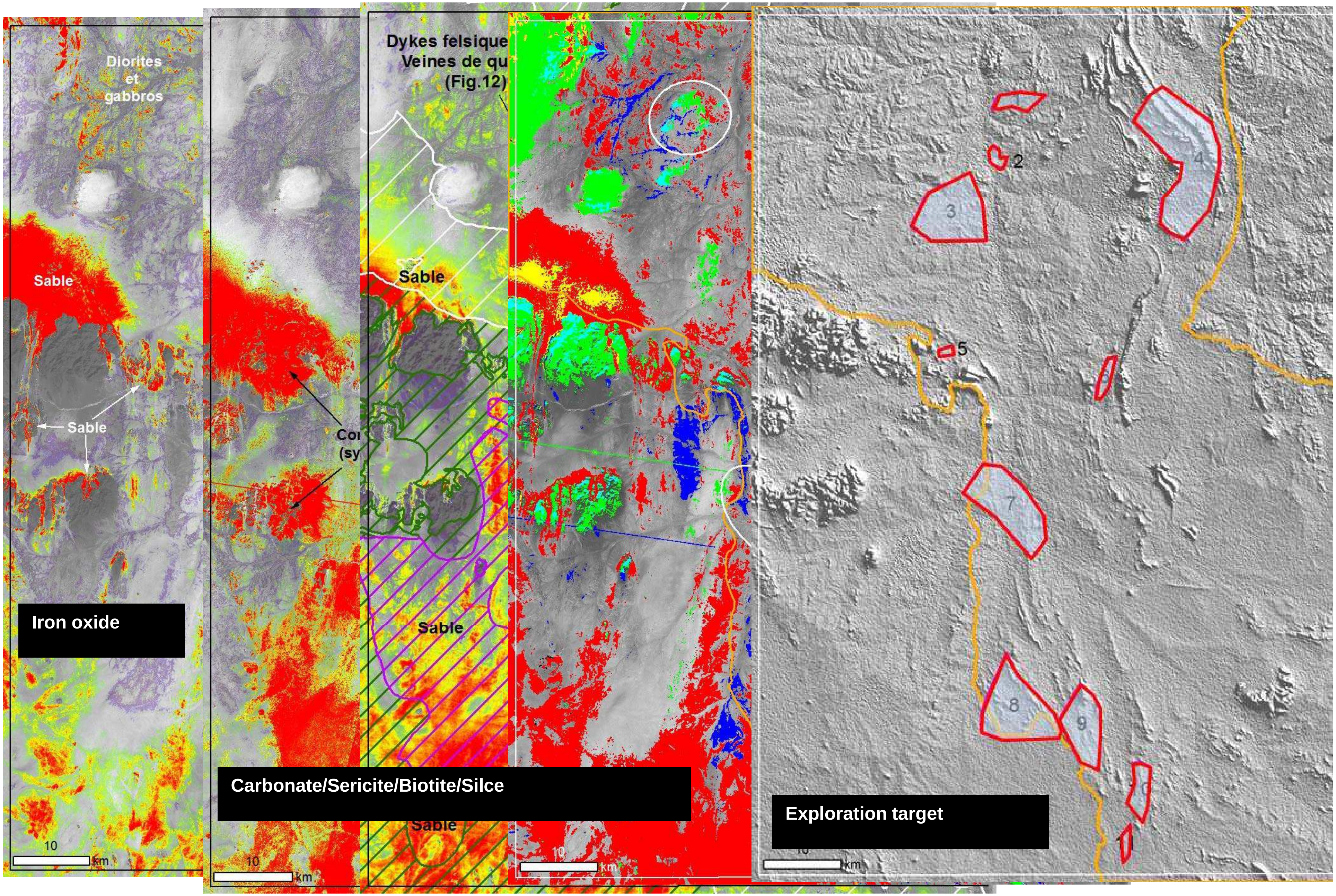
BRGM – Results of strategic works





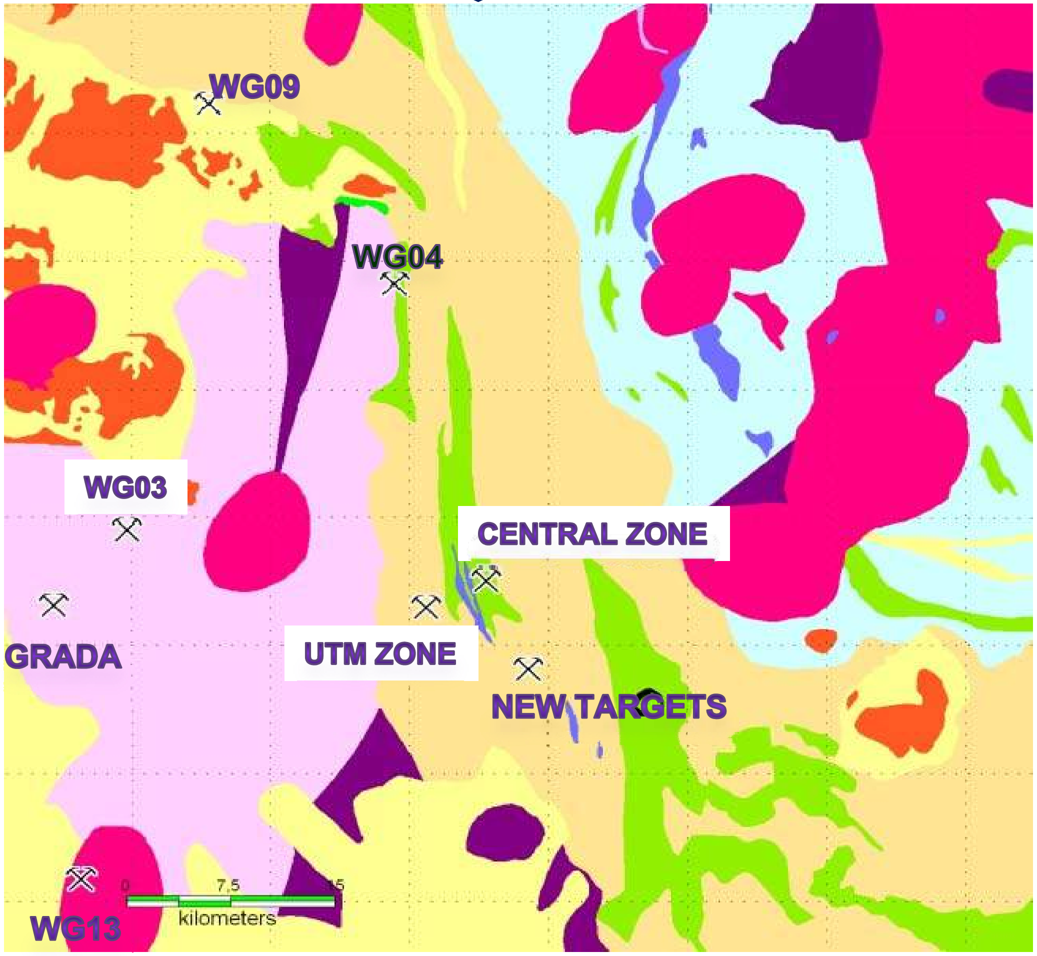


Remote sensing: Block 15



Exploration works conducted in Sudan

Block 15



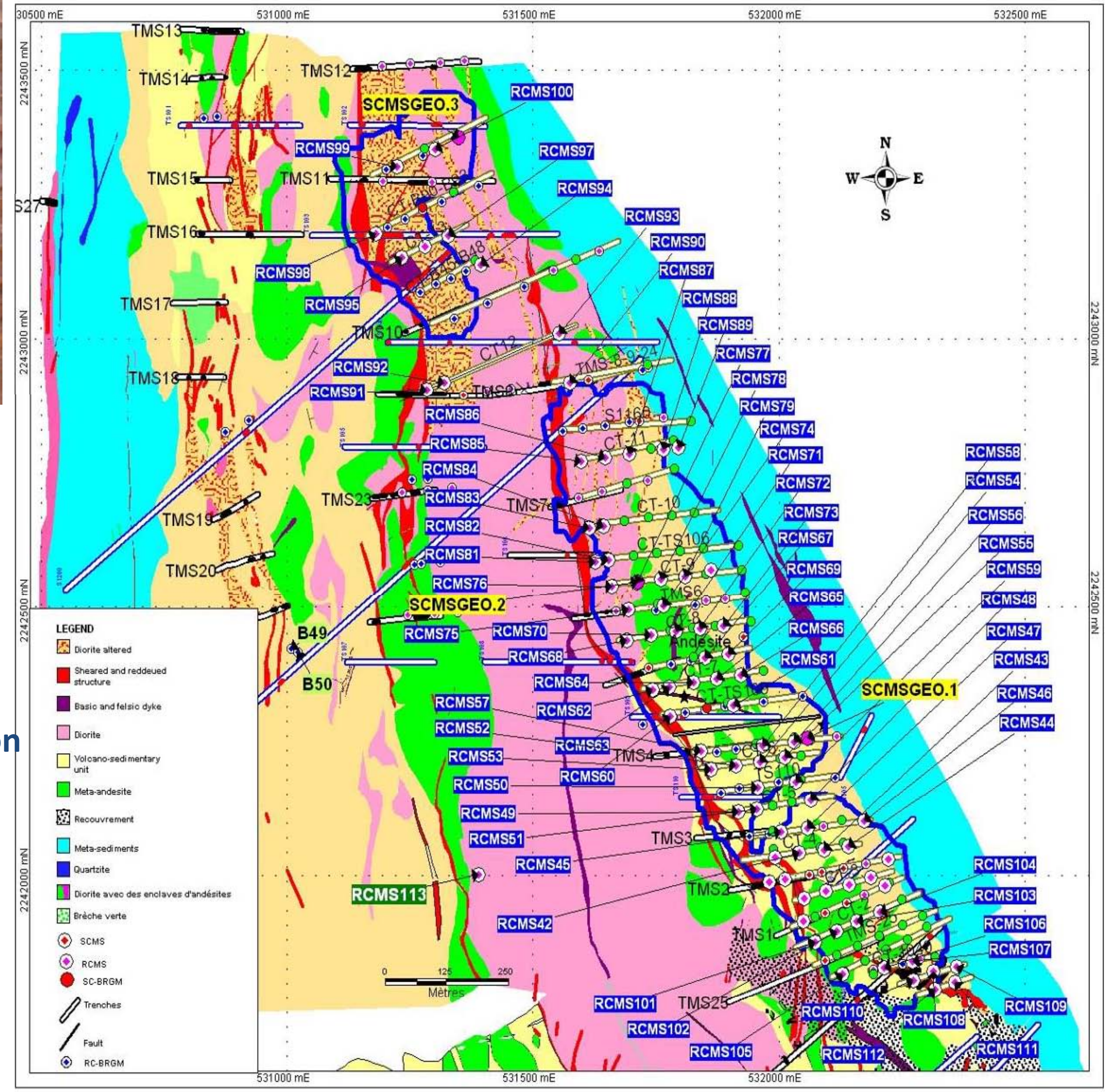
Exploration works performed by MCM – Geology

→ **Deformed network of quartz veins**

→ **Shear corridor dipping gently to the east**

→ **Country rock (diorite and andesite)**

→ **Strong hydrothermal alteration: iron carbonates; disseminated pyrite; silicification**



UTM - Exploration works performed by MCM – Trenches/RC/DD

شركة مناجم العالمية للتعدين المحدودة



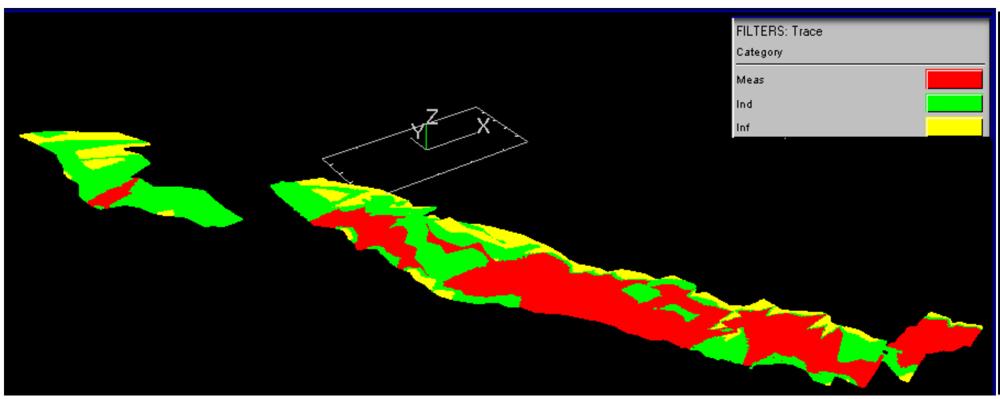
Zone	Trenches	Lenght (m)	No of samples	Prepared samples	Analysed samples
UTM	27	4281	3106	3106	3106

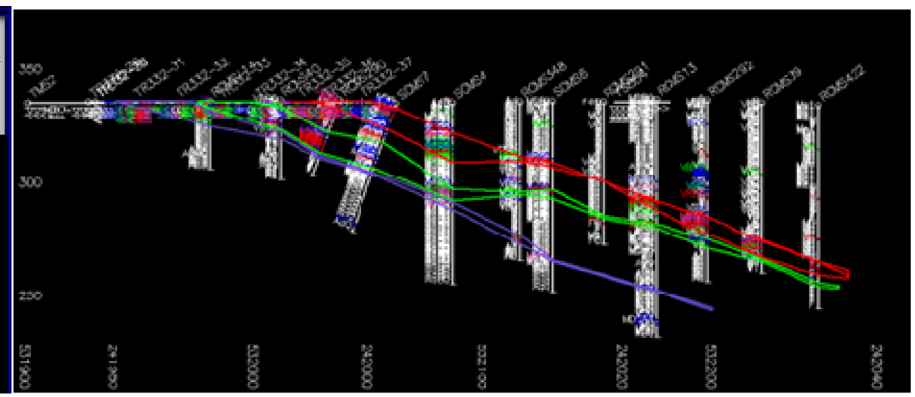
Zone	RC		DD		%DD/RC
	Lenght (m)	No. drill	Lenght (m)	No. drill	
UTM	29512	539	892	12	2

UTM – Resources estimation & bloc model

Drill spacing 25mx25m

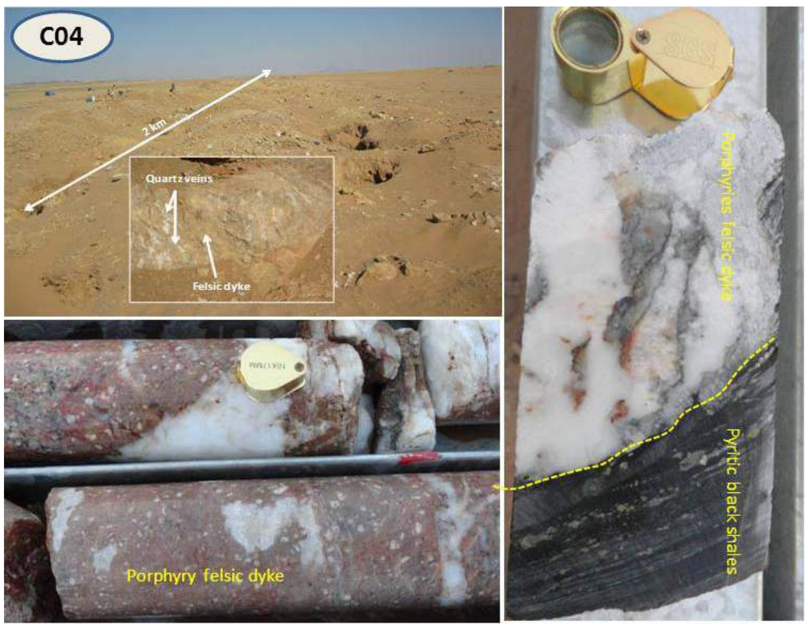
UTM – As of May 2013					
Zone	**Cut-off grade (g/t Au)**	**Classification**	**Tonnage (t)**	**Grade (g/t Au)**	**Metal (Oz)**
UTM	0.35	Measured	3 759 000	1.95	236 000
UTM	0.35	Indicated	1 413 000	1.59	72 000
UTM	0.35	**Measured+Indicated**	**5 172 000**	**1.85**	**308 000**
UTM	0.35	Inferred	324 000	1.75	18 000
	Total		**5 496 000**	**1.85**	**326 000**

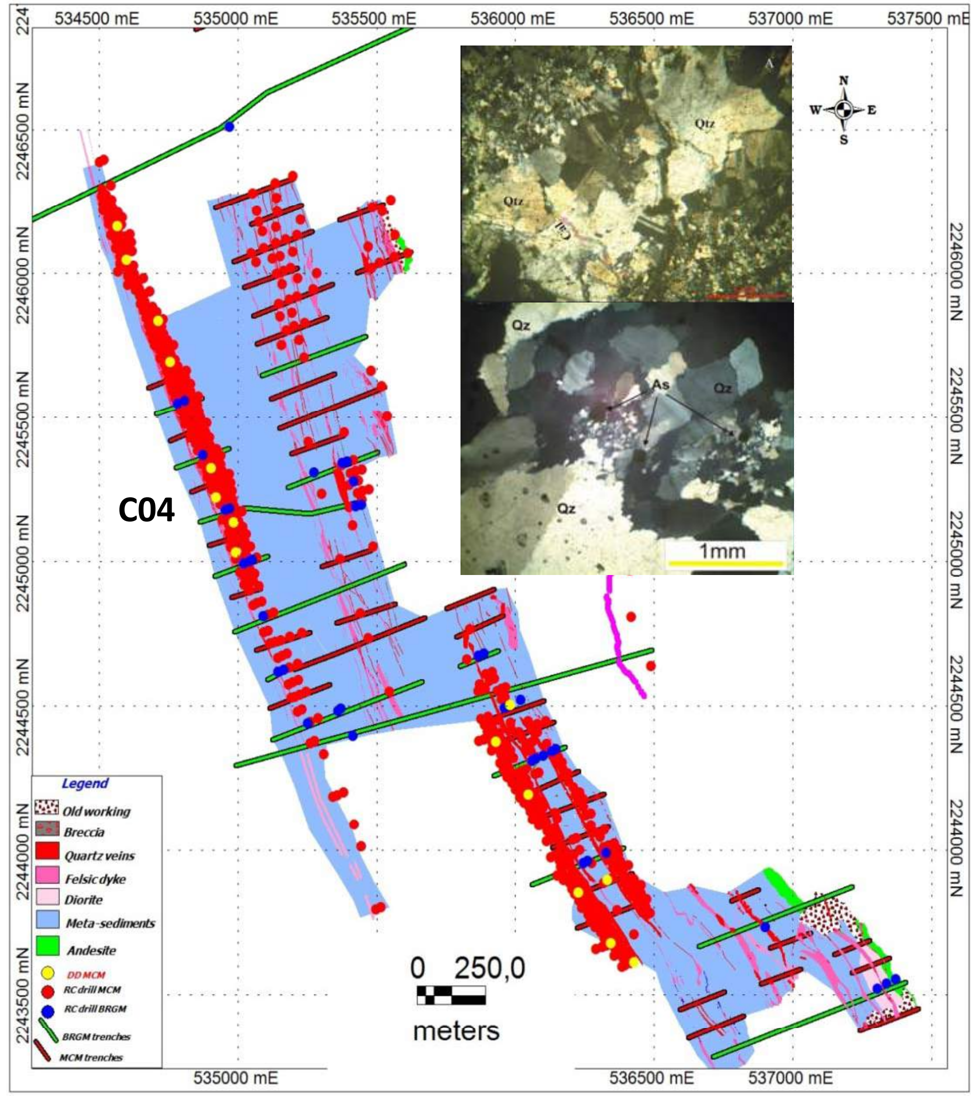




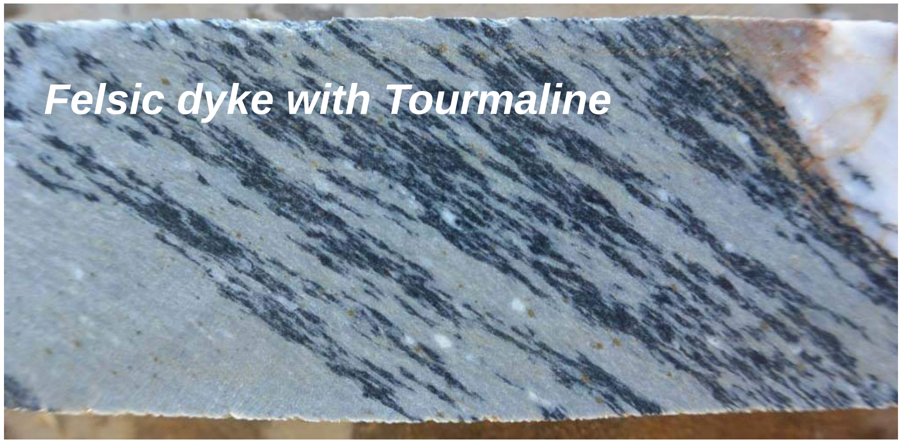
Central Zone – C04 – Localization & Geology

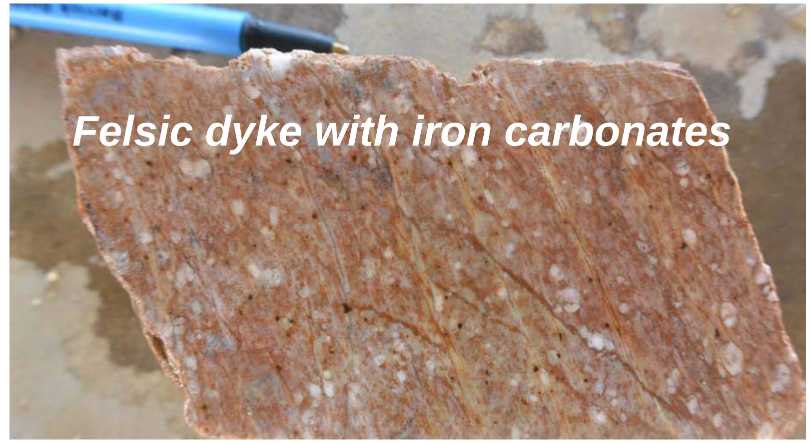
- Deformed network of quartz veins
- Host rocks: microgranodiorite dyke
- Country rock : black shales
- Hydrothermal alteration: carb.Hem.Ser. Tourmaline, leucoxene, disseminated pyrite





Central Zone – Performed work – RC & DD –

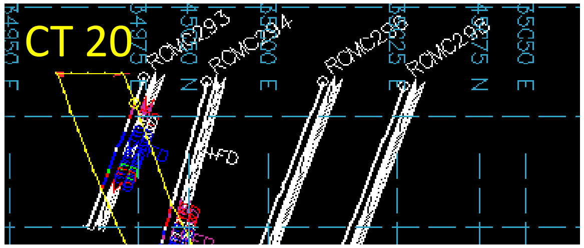


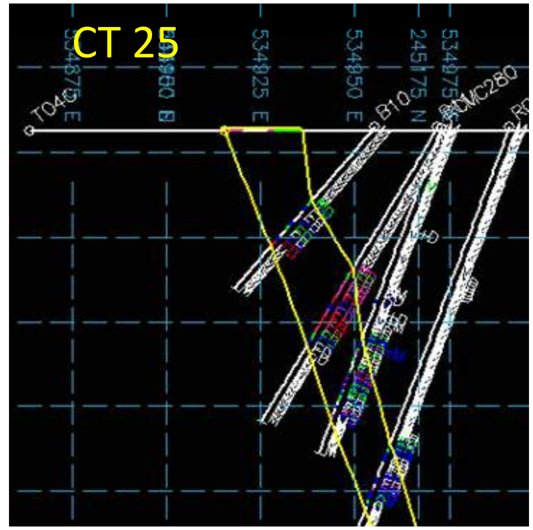


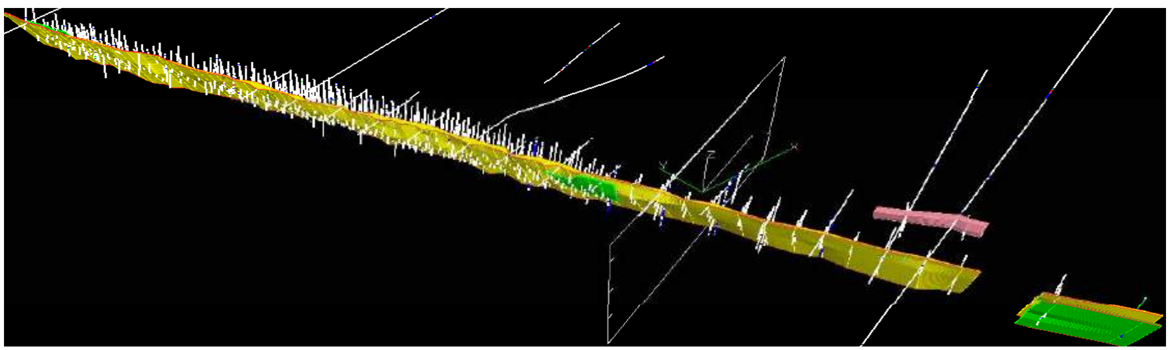
Zone	Trenches	Lenght (m)	No of samples	Prepared samples	Analysed samples
Central	39	8296	5853	5853	5302

Zone	RC		DD		%DD/RC
	Lenght (m)	No. drill	Lenght (m)	No. drill	
C04	22970	250	703	9	4

Central Zone – C04 - Mineral resources





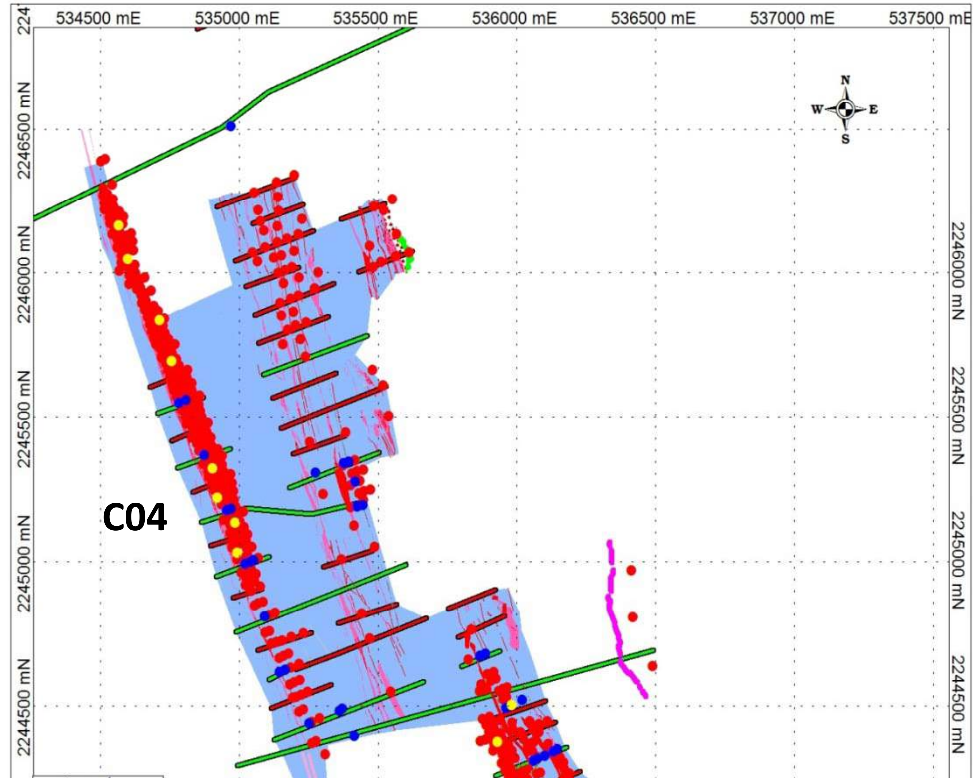


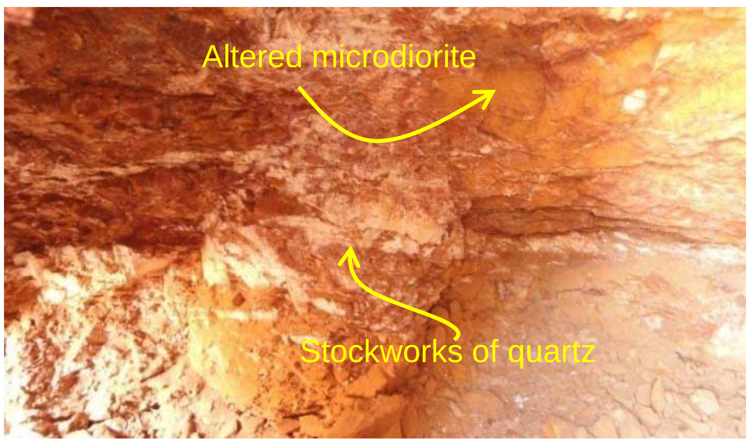
C04 – As of January 2013

zone	Cut-off grade (g/t Au)	Classification	Tonnage (t)	Grade (g/t Au)	Metal (Oz)
C04	0.33	Measured	3 978 000	1.98	254 000
C04	0.33	Indicated	432 000	2.43	34 000
C04	0.33	**Measured+ Indicated**	**4 410 000**	**2.03**	**288 000**
C04	0.33	Inferred	2 000	2.97	200
	Total		**4 412 000**	**2.03**	**288 200**

Central Zone – C02 – Geology and location

- **Deformed network of quartz veins**
- **Host rocks: microgranodiorite dyke**
- **Country rock : black shales**
- **Hydrothermal alteration: carb.Hem.Ser**

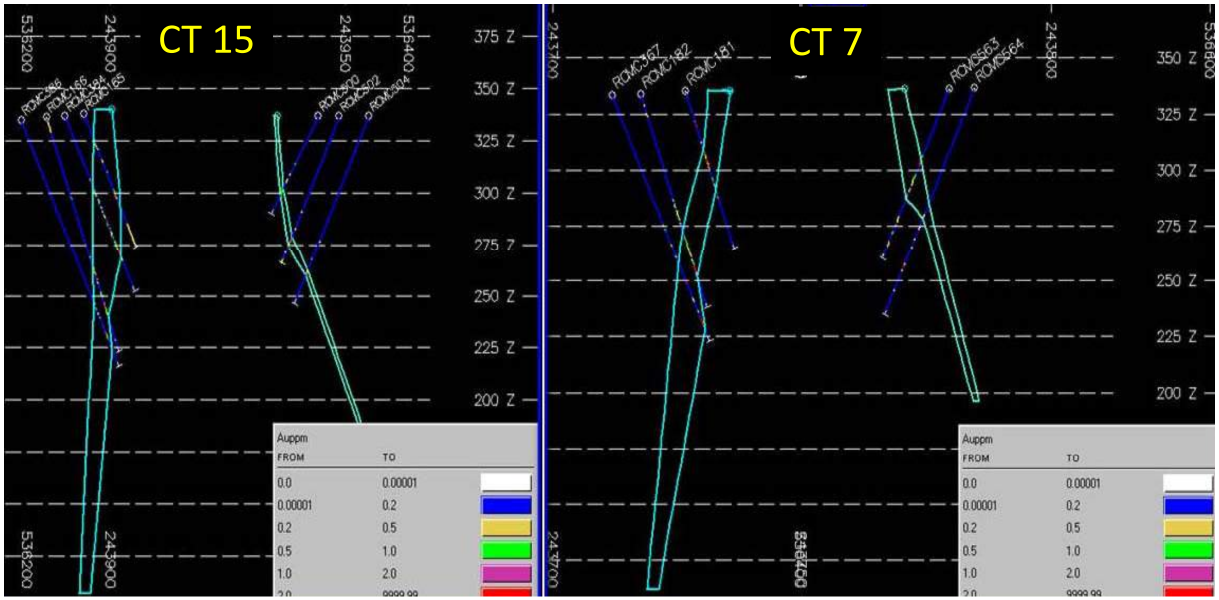




Central Zone – C04 - Mineral resources

Zone	Trenches	Lenght (m)	No of samples	Prepared samples	Analysed samples
Central	39	8296	5853	5853	5302

Zone	RC		DD		%DD/RC
	Lenght (m)	No. drill	Lenght (m)	No. drill	
C02	24 398	246	632	7	3

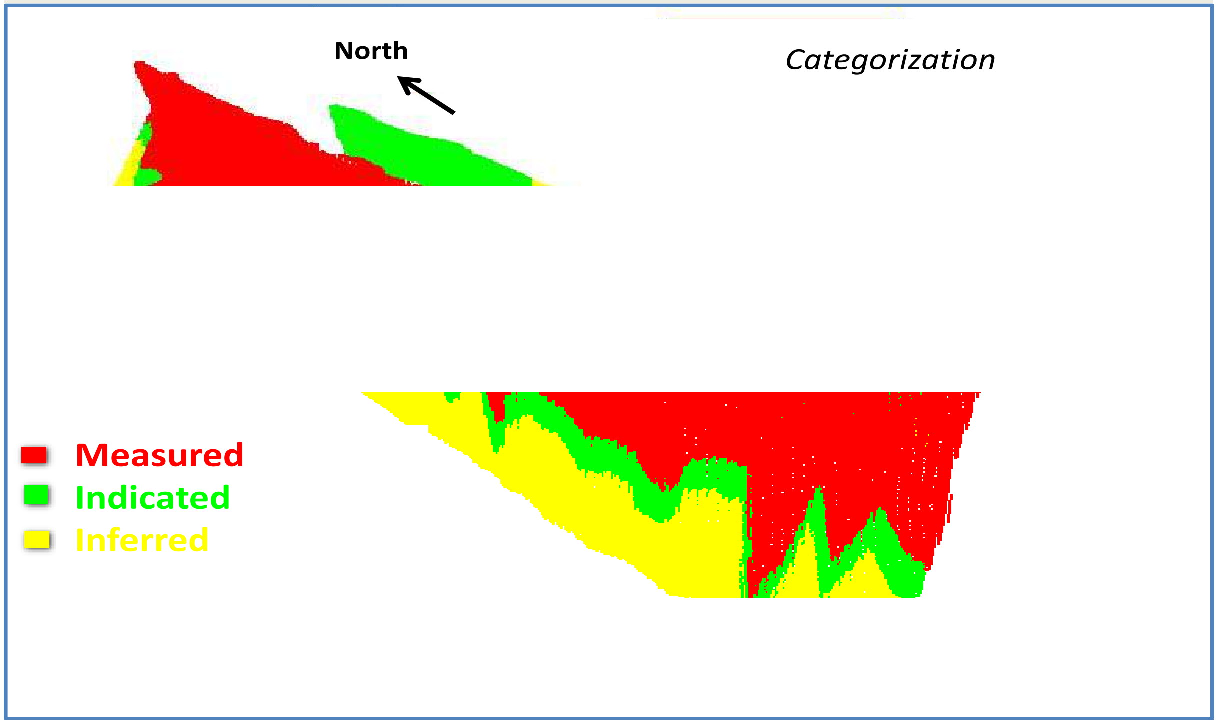


Central Zone – C02 - Mineral resources

Drill spacing 25mx25m

C02 – As of January 2013					
Zone	**Cut-off grade (g/t Au)**	**Classification**	**Tonnage (t)**	**Grade (g/t Au)**	**Metal (Oz)**
C02	0.33	Measured	2 481 000	1.65	132 000
C02	0.33	Indicated	319 000	1.71	18 000
C02	0.33	**Measured+Indicated**	**2 800 000**	**1.66**	**150 000**
C02	0.33	Inferred	16 000	1.46	1 000
	Total		**2 816 000**	**1.66**	**151 000**

C02



WG03 – Location & Geology

→ Located in the western part of the KSZ

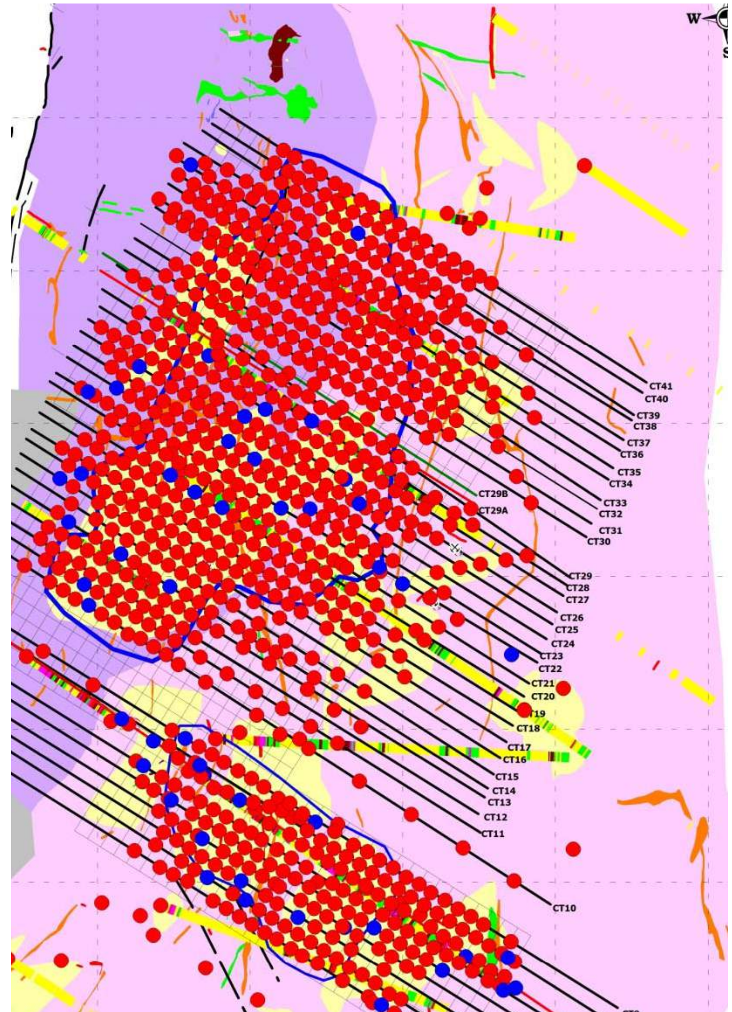
→ The geology is dominated by the sheared coarse- grained to porphyric diorite with basic to acid meta-volcanic rocks crosscut by gold bearing quartz veins

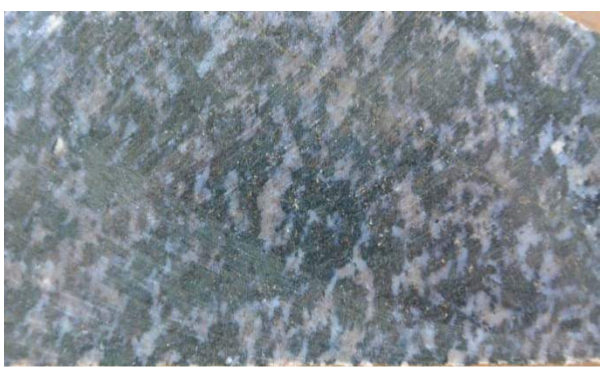
→ Metamorphism: amphibolite

→ Two types of the mineralization:

- → Biotite, horenblend, disseminated pyrrhotite
- → Chlorite, albite with pyrite

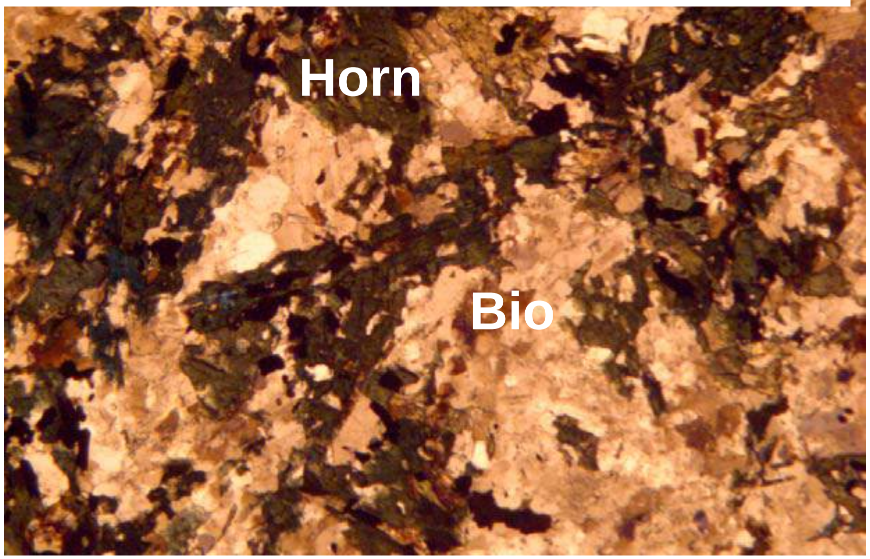
→ The structures present a geological dome and draw an anticlinal form with a sub-vertical axial plane striking N30°.

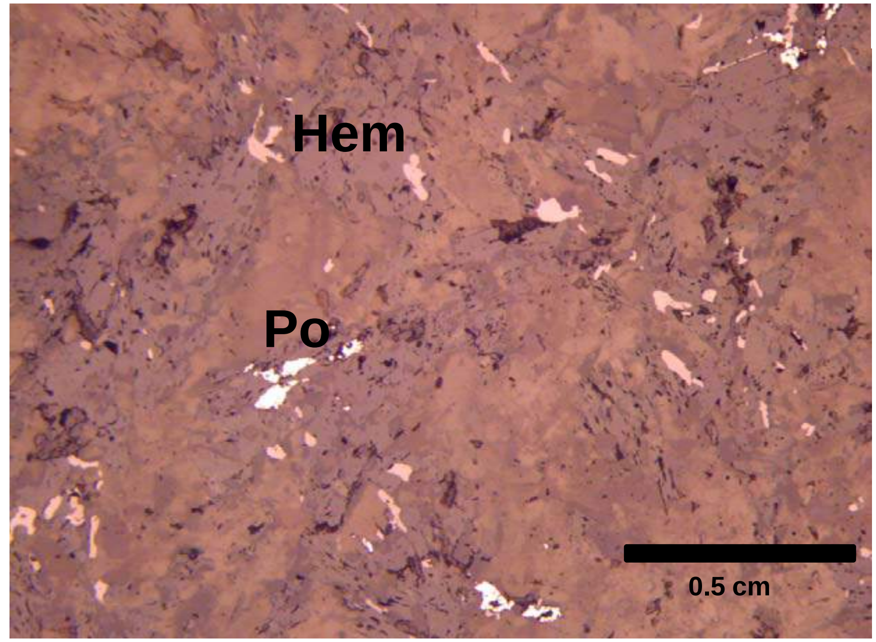




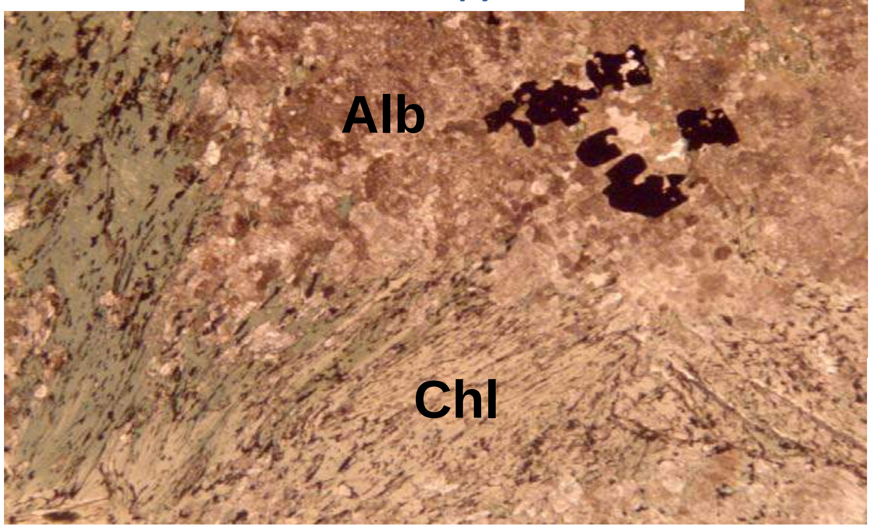
WG03 – Orogenic mineralization Vs disseminated

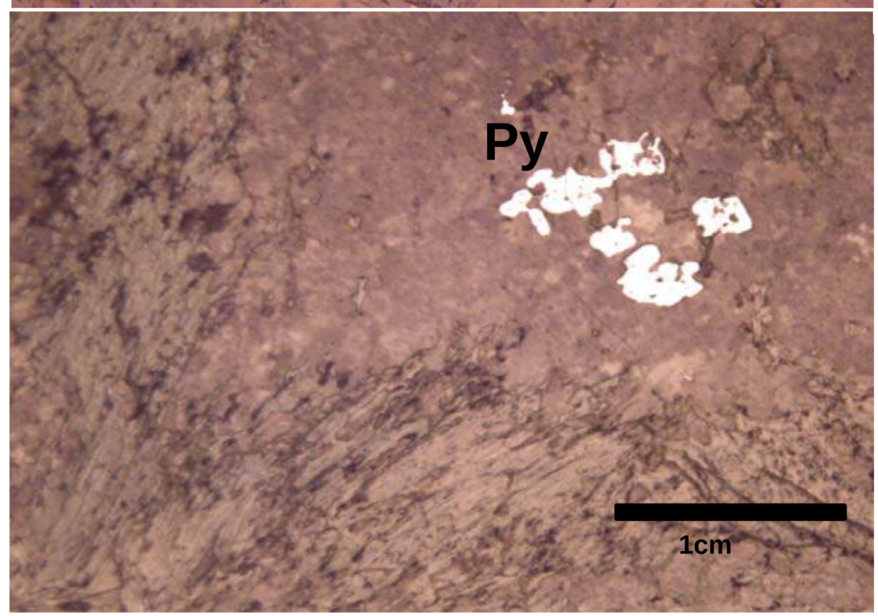
→ **Biotite – hornblende - pyrrhotite**





→ **Chlorite - albite - pyrite**

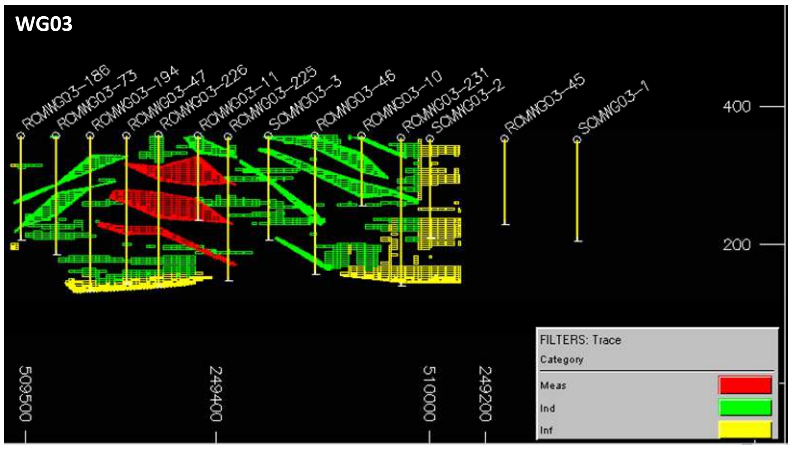


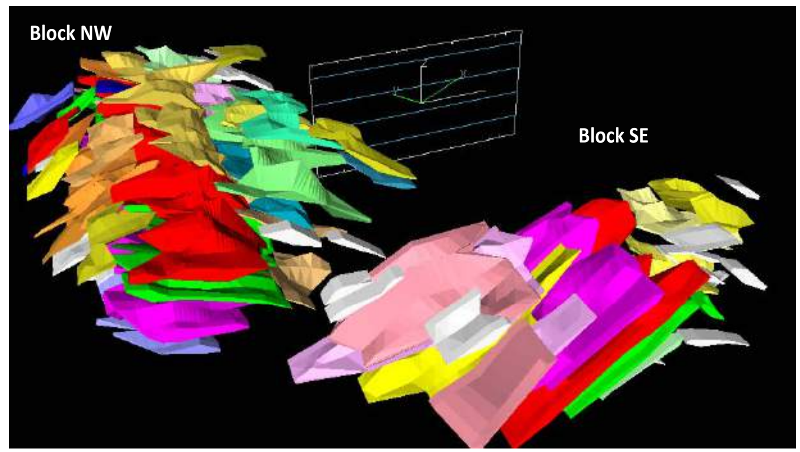


WG03 – Exploration work (ongoing Rc drilling program; spacing 25x25m – Mineral resources

Zone	RC		DD		%DD/RC
	Lenght (m)	No. drill	Lenght (m)	No. drill	
WG03	65 229	421	3261	20	5

Zone	Trenches	Lenght (m)
WG03	7	4252

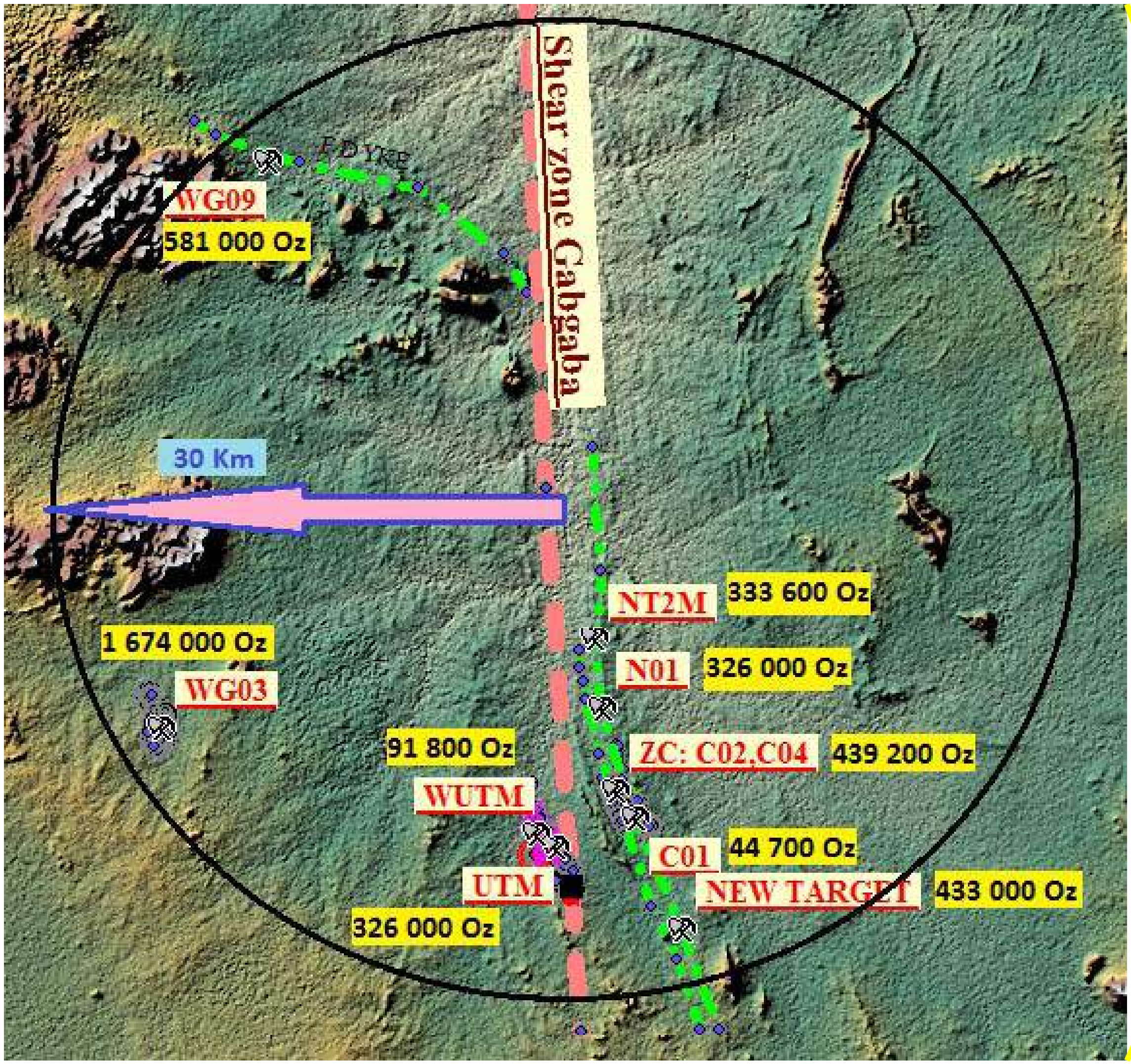


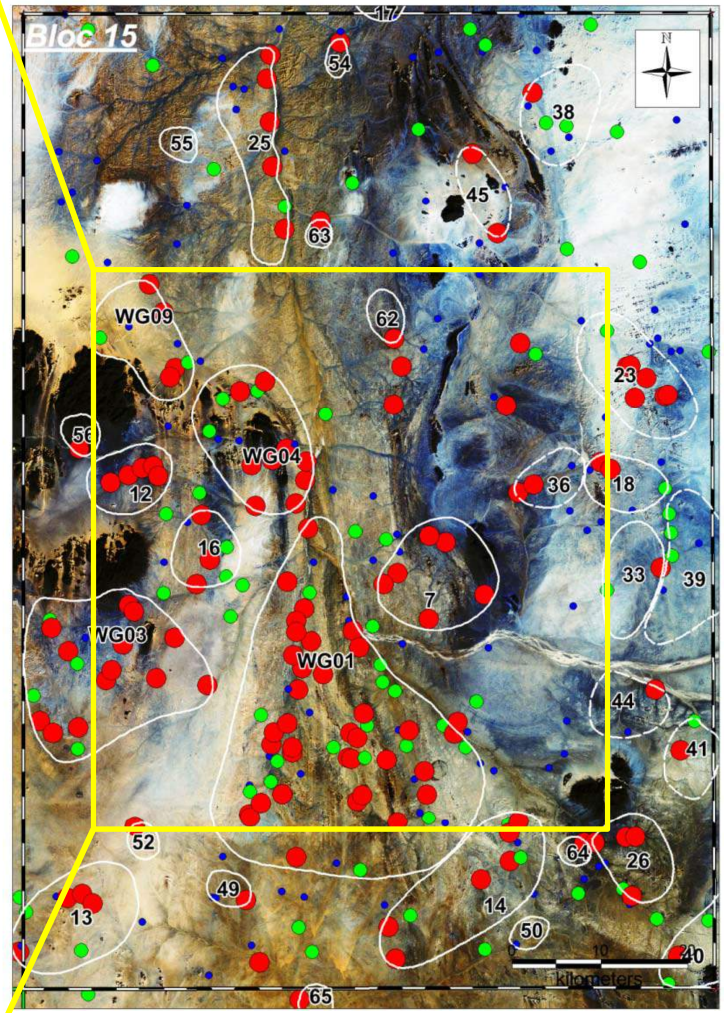


WG03 – As of October 2013

Zone	Cut-off grade (g/t Au)	Classification	Tonnage (t)	Grade (g/t Au)	Metal (Oz)
WG03	0.43	Measured	11 881 000	1.61	614 000
WG03	0.43	Indicated	21 218 000	1.53	1 045 000
WG03	0.43	**Measured+Indicated**	**33 099 000**	**1.56**	**1 659 000**
WG03	0.43	Inferred	426 000	1.09	15 000
	Total		**33 525 000**	**1.55**	**1 674 000**

Exploration Activity in Potential Extension





Exploration Tools and Staff in Sudan

- → Total Staff : 260 including exploration, labs and industrial pilot plant unit
- → Laboratory of sample preparation and Analysis (Fire assay)
  - → Capacity of : 700 samples per day
- → Drilling machines with a capacity of 200 000 m drills per year
  - → 5 RC (Reverse Circulation)
  - → 1 DD (Diamond Drill)
  - → 1 percution machine
- → Complete staff-house with fully equipped nursery
- → Water treatment unit

Phase 1 Pilot Plant Project – Block 15

Pilot processing plant overview:

- Start-up of the production: August 2012
- Objective: Starting mining activity with existing fresh ore and tailings along with the ongoing exploration
- Confirming all technical parameters and processing performances of the BFS, which are decisive in the full scale project profitability
- Processing capacity : 750 tpd of Ore by adding a flotation circuit

Highlights & Main Achievements
Corporate Social Responsibility

MANUB

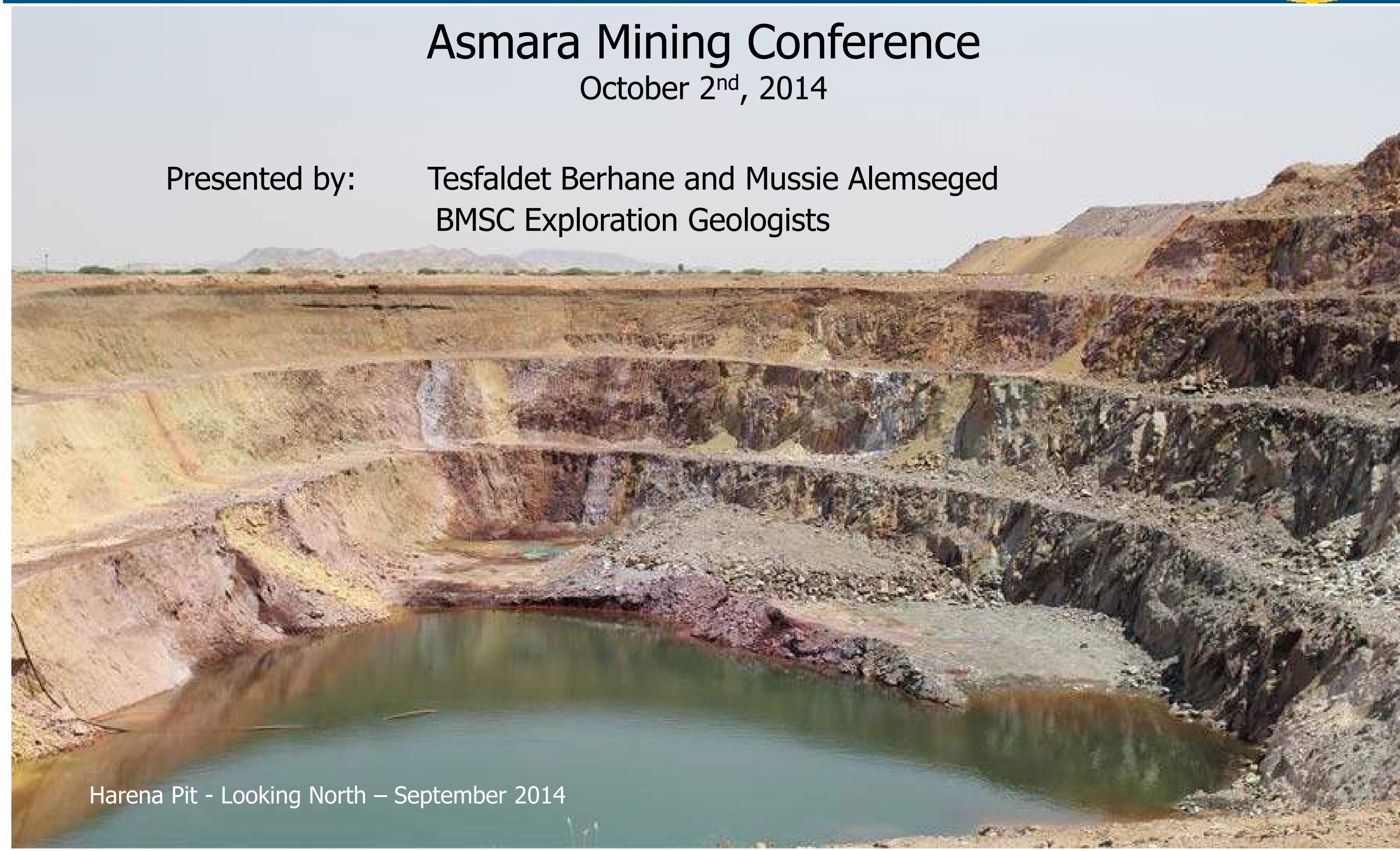
Objective : Contribute to local development

		Total en SDG
Education	1. Furnishing of the existing dormitories 2. Distribution of encouraging presents to deserving students 3. Study grant 4. School Transport expenses contributions	103 000
Health	1. Ophthalmologist caravan at Mahalyat Barbar From 7/03/2014 to 13/03/2014 Number of medical examinations: 2481 citizen Number of chirurgical operations: 93 citizen Number of delivered glasses : 1151	123 000
Access to water	1. Borehole drilling and pumping equipment (B9)	80 000
Other Helps	1. Contribution to help victims of July and August floods 2. Contribution to help necessitous families during Ramadan 3. Contribution for regional wedding ceremony organized by the Nile State government	320 000
Total		**626 000**

GEOLOGY and STRATIGRAPHY
HARENA MINE Area

Asmara Mining Conference
October 2nd, 2014

Presented by: Tesfaldet Berhane and Mussie Alemseged
BMSC Exploration Geologists



Harena Pit - Looking North – September 2014

Forward Looking Statements

This Presentation contains forward-looking statements within the meaning of the United States Private Securities Litigation Reform Act of 1995 and applicable Canadian securities legislation concerning anticipated developments on the Company's continuing and future operations in Eritrea, the adequacy of the Company's financial resources and financial projections. Forward-looking statements include, but are not limited to, statements concerning or the assumptions related to estimates of capital and operating costs, the timing, nature and extent of future copper, zinc and gold production, expanding exploration licenses, the estimation of mineral reserves and resources, methodologies and models used to prepare resource and reserve estimates, the realization of mineral reserve estimates, the conversion of mineral properties to reserves and resources, the potential to expand resources, reserves and mine life, future exploration budgets, plans, targets and work programs, capital expenditures and objectives, anticipated timing of grant of permits, mining and development plans and activities, construction and production targets and timetables, grades, processing rates, life of mine, net cash flows, metal prices, exchange rates, reclamation costs, results of drill programs, dividend plans and policy, litigation matters, integration or expansion of operations, requirements for additional capital, government regulation of mining operations, environmental risks, political risks and uncertainties, unanticipated reclamation expenses, and other events or conditions that may occur in the future. Forward-looking statements are frequently, but not always, identified by words such as "expects," "anticipates," "believes,“ "intends," "estimated," "potential," "possible", "budget" and similar expressions, or statements that events, conditions or results "will," "may,“ "could" or "should" occur or be achieved. Information concerning the interpretation of drill results and mineral resource and mineral reserve estimates also may be deemed to be forward-looking statements, as such information constitutes a prediction of what mineralization might be found to be present if and when a project is actually developed, and in the case of mineral reserves, such statements reflect the conclusion based on certain assumptions that the mineral deposit can be economically exploited.

Forward-looking statements are statements about the future and are inherently uncertain, and actual achievements of the Company or other future events or conditions may differ materially from those reflected in the forward-looking statements due to a variety of risks, uncertainties and other factors. Although the Company has attempted to identify important factors that could cause actual results to differ materially from those contained in forward-looking statements, there may be other factors that cause results not to be as anticipated, estimated or intended. The Company's forward-looking statements are based on the beliefs, expectations and opinions of management on the date the statements are made and the Company assumes no obligation to update such forward-looking statements in the future, except as required by law. There can be no assurance that such statements will prove to be accurate, as actual results and future events could differ materially from those anticipated in such statements. For the reasons set forth above, investors should not place undue reliance on forward-looking statements.

Please see the Company's Annual Information Form and Management Discussion and Analysis of BMSC for a more complete discussion of the risk factors associated with our business which have been filed with Canadian securities regulators and are available at www.sedar.com, which have also been filed or submitted to the U.S. Securities and Exchange Commission on Form 40-F or Form 6-K and are available at www.sec.gov .

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Objectives

- Previous exploration – what were the objectives?
- 2014 Exploration – a new focus
- To outline the Geology and Stratigraphy of the immediate Harena Mine area – using good observations and lithogeochemistry to identify rock type and important alteration.
- To generate targets – using the defined stratigraphy in association with geophysics

Outline

1. Location (relative to the Bisha Mine)
2. Previous Exploration
3. 2014 Exploration Activities
4. Geology and Stratigraphy
5. Hydrothermal Ateration
6. Mineralization
7. Conclusion

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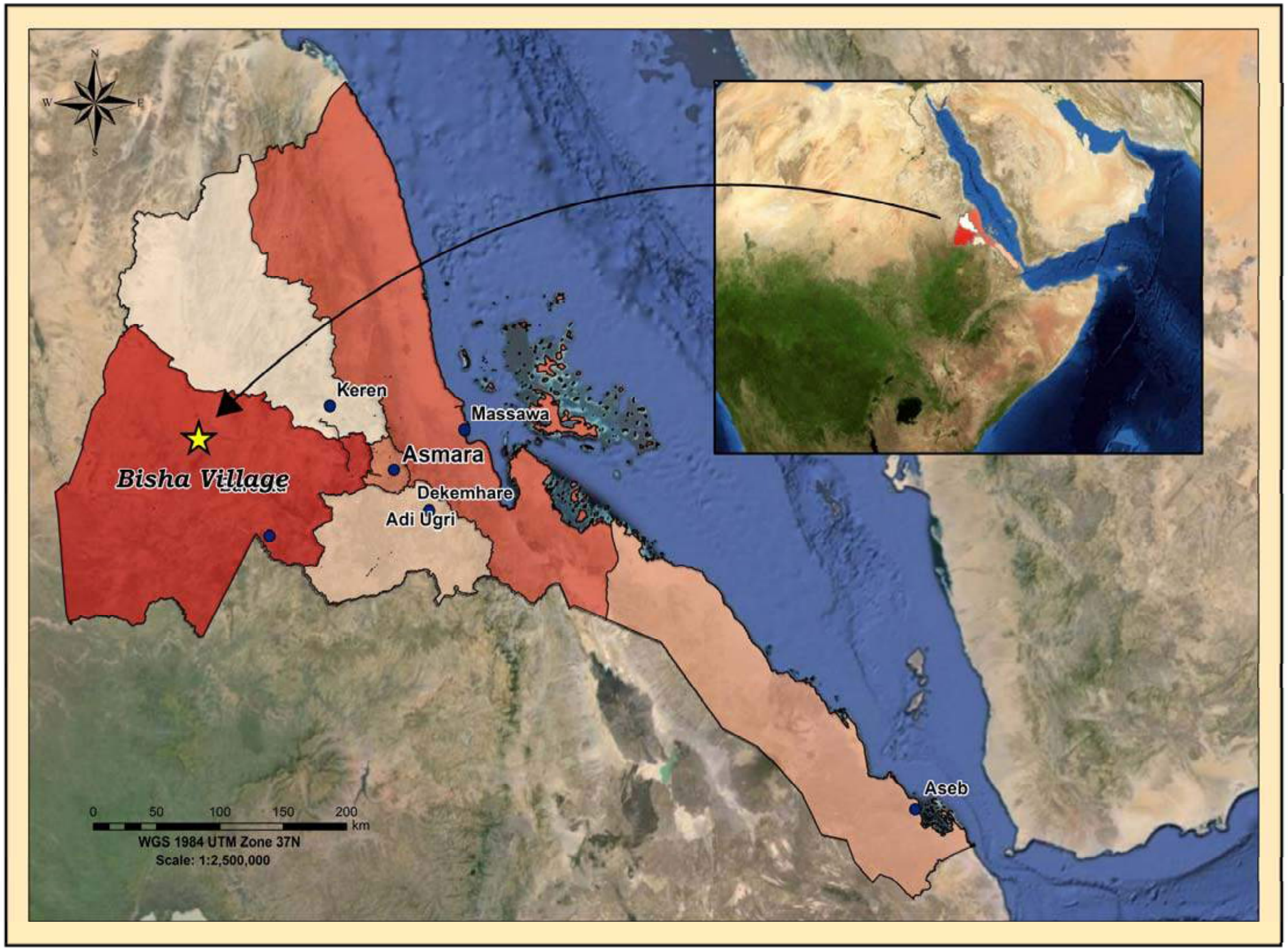
Location Map



233km by road west of Asmara, in the Gash Barka Region

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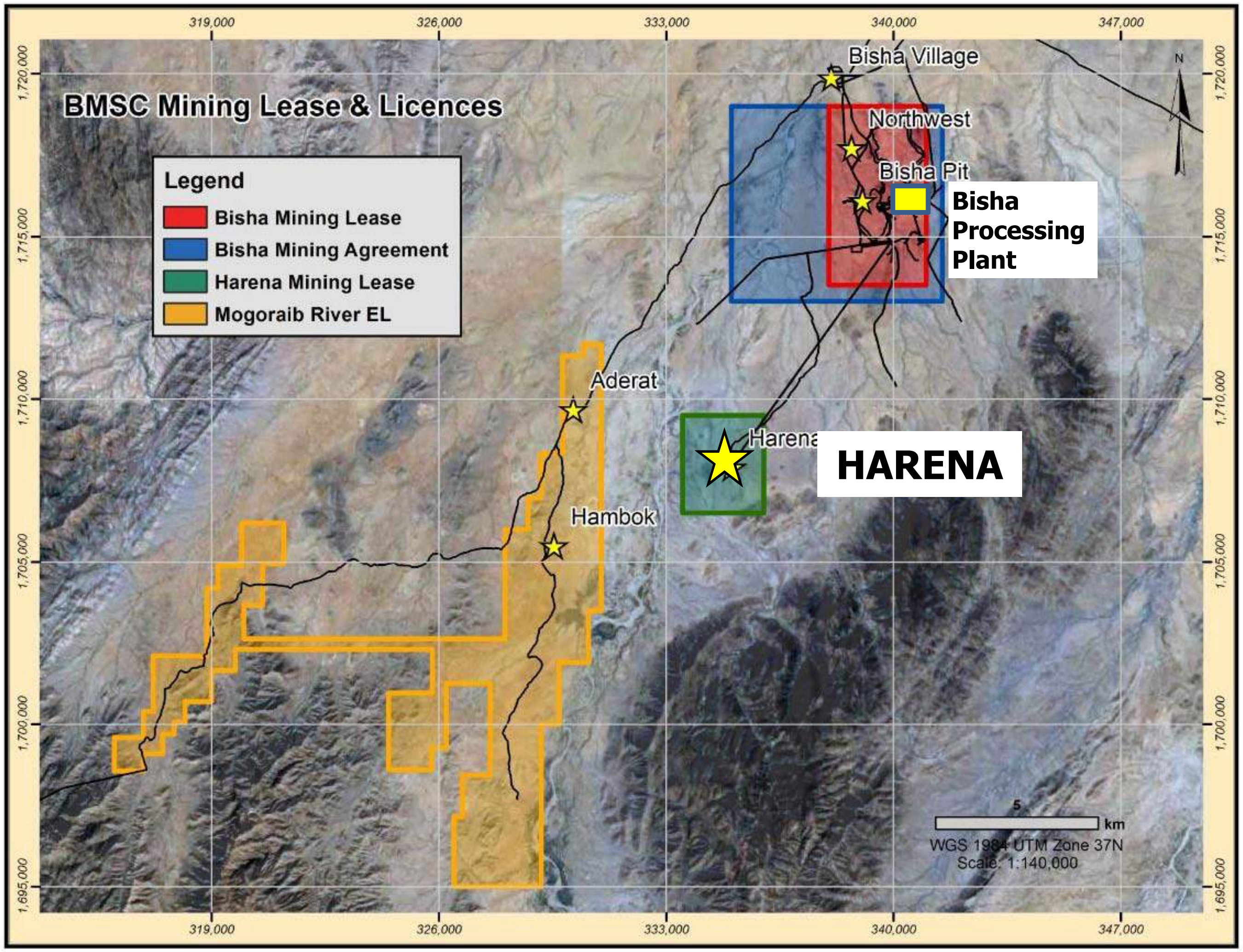
Property Map



Harena Mining License:

9km South of Bisha Mine VMS

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Previous Exploration

- First identified as a small alteration feature on the land sat imagery by Nevsun Resources
- Subsequent exploration in the area continued during 2004 and defined:
  - Coincident soil geochemistry and gravity anomalies
  - Favourable geology and alteration associated with massive sulphide deposits.
- Further exploration methods included EM, Mag, IP and Resistivity surveys were conducted
- Metallurgical test work
- Bulk density measurements and geotechnical works
- Resource and Reserve estimation

Previous Drilling

Year	Diamond Drill Holes	metres	
2005	27	4,072	First Exploration Drilling
2009	17	2,164	In-fill drilling
2010	37	2,896	Resource & Reserve drilling
2011	5	852	Resource & Reserve drilling
2012	6	1,123	Production
Total	**92**	**11,106**	
2014	29	9,450	Exploration

Most of previous drilling focused on defining the Oxide Gold for Production in 2012 and 2013

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Harena - Reserves & Resources

Harena Mineral Resource Estimate (December31 2013) – Nevsun 43-101 Bisha Mine						
Zone	**NSR Cutoff ($/t)**	**Tonnes ('000s)**	**Cu %**	**Zn %**	**Au g/t**	**Ag g/t**
Indicated						
Oxide Phase	42.41	70	-	-	5.5	14
Primary Phase	41.41	1,800	0.65	3.91	0.6	23
Total		**1,870**				
Inferred						
Oxide Phase	40.55	20	-	-	5.9	8
Primary Phase	39.55	350	0.75	4.1	0.8	32
Total		**370**				
Harena Probable Mneral Reserve Estimate						
Oxide Phase		80	-	-	4.93	16
Primary Phase		1,160	0.64	3.57	0.52	22
Total		**1,240**				

NSR Cut-Off for Resources: Cu ($3.35/lb), Zn ($1.05/lb), Au ($1,350/oz), and Ag ($23/oz).
NSR Cut-Off for Reserves: Cu ($2.90/lb), Zn ($0.92/lb), Au ($1,175/oz), and Ag ($20/oz).
See NI 43-101 Report dated December 31, 2013 for additional details.

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2014 Exploration Activities

2014 Exploration Activities			
Diamond Drilling	9,450 meters	29 holes	Drilling Ongoing
Airborne Geophysics	VTEM EM-Mag Survey	180km	Completed
Ground Geophysics	FLEM "Fixed-Loop EM" surveys	50km	Completed
Borehole Geophysics	3-component BHEM + Physical Properties probe	12 holes	Ongoing
Geochemistry	Systematic Whole rock and trace element sampling	29 holes > 300 samples	Ongoing
Re-Logging	re-logging & WRA sampling of selected historic holes	12 holes, ~80 samples	Completed

Main tools are diamond drilling and geophysics in association with re-logging of historic holes and geochemistry to identify rock types and alteration styles

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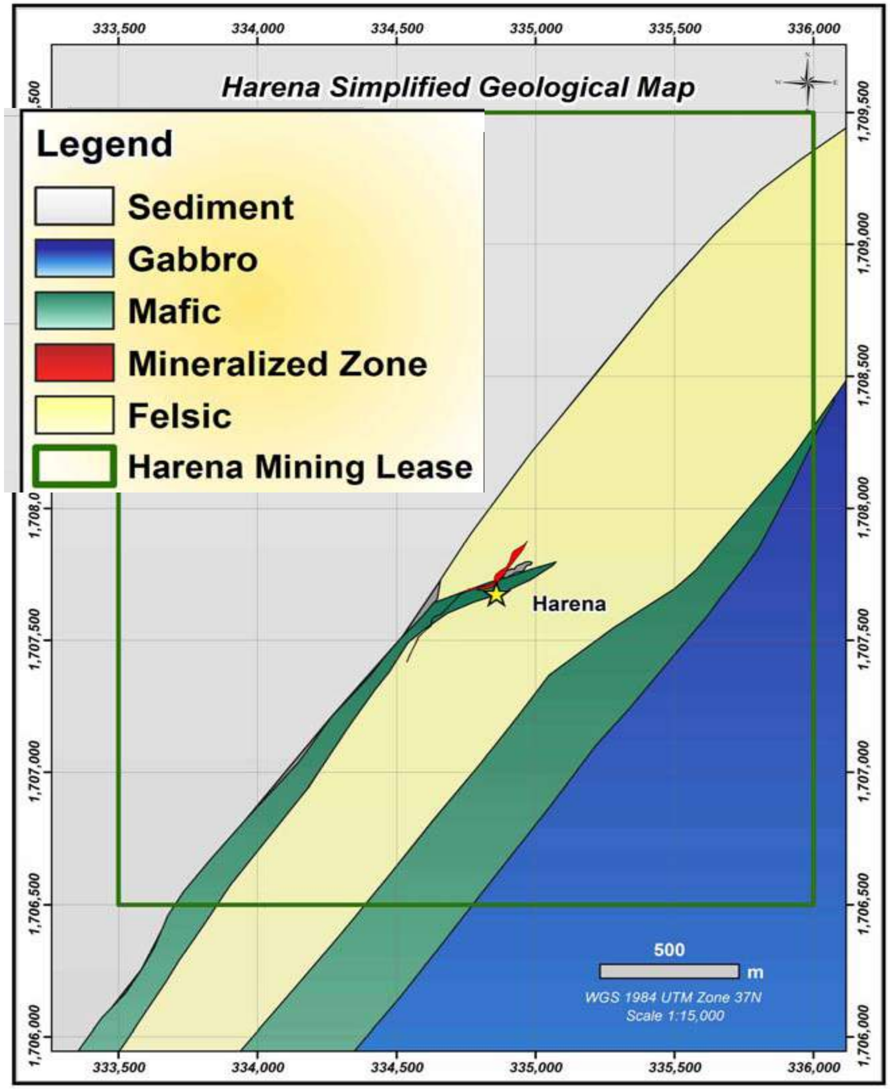
Geology and Stratigraphy



STRATIGRAPHY

Meta-Sediments: Graphitic Mudstone & Greywacke

Gabbroic Complex:

Felsic Volcanics: Occurs in both Hangingwall and Footwall

Mafic Volcanic: variable, fine to medium grained, plage-phyric

Mafic - Intermediate Dykes: three types are known

STRUCTURE

Faults are manifested by strongly brecciated zones observed on drill cores

The rocks are weak to moderately schistose with slight variations in orientation

Small scale folds are also commonly observed in the hanging wall

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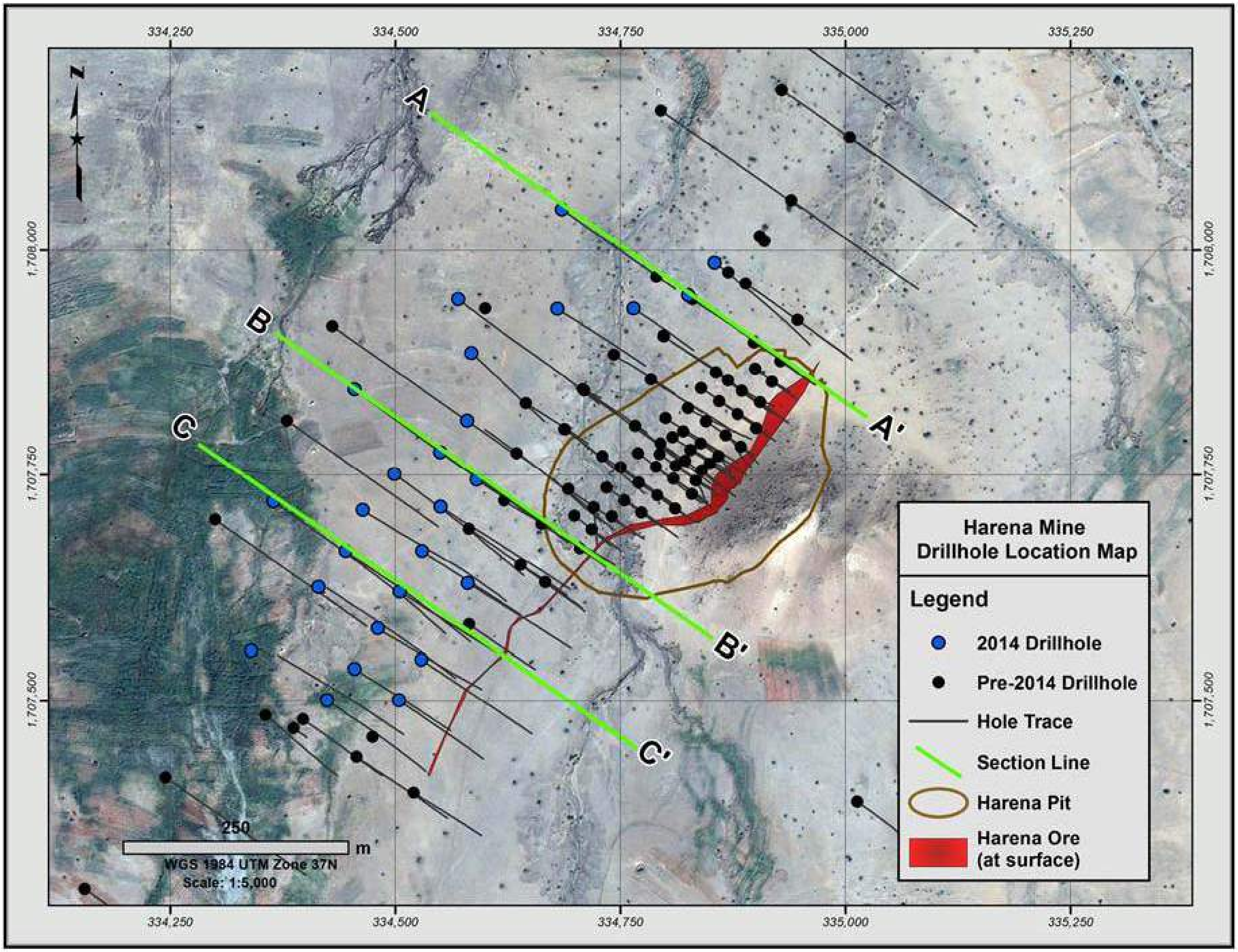
Stratigraphic Cross-Sections



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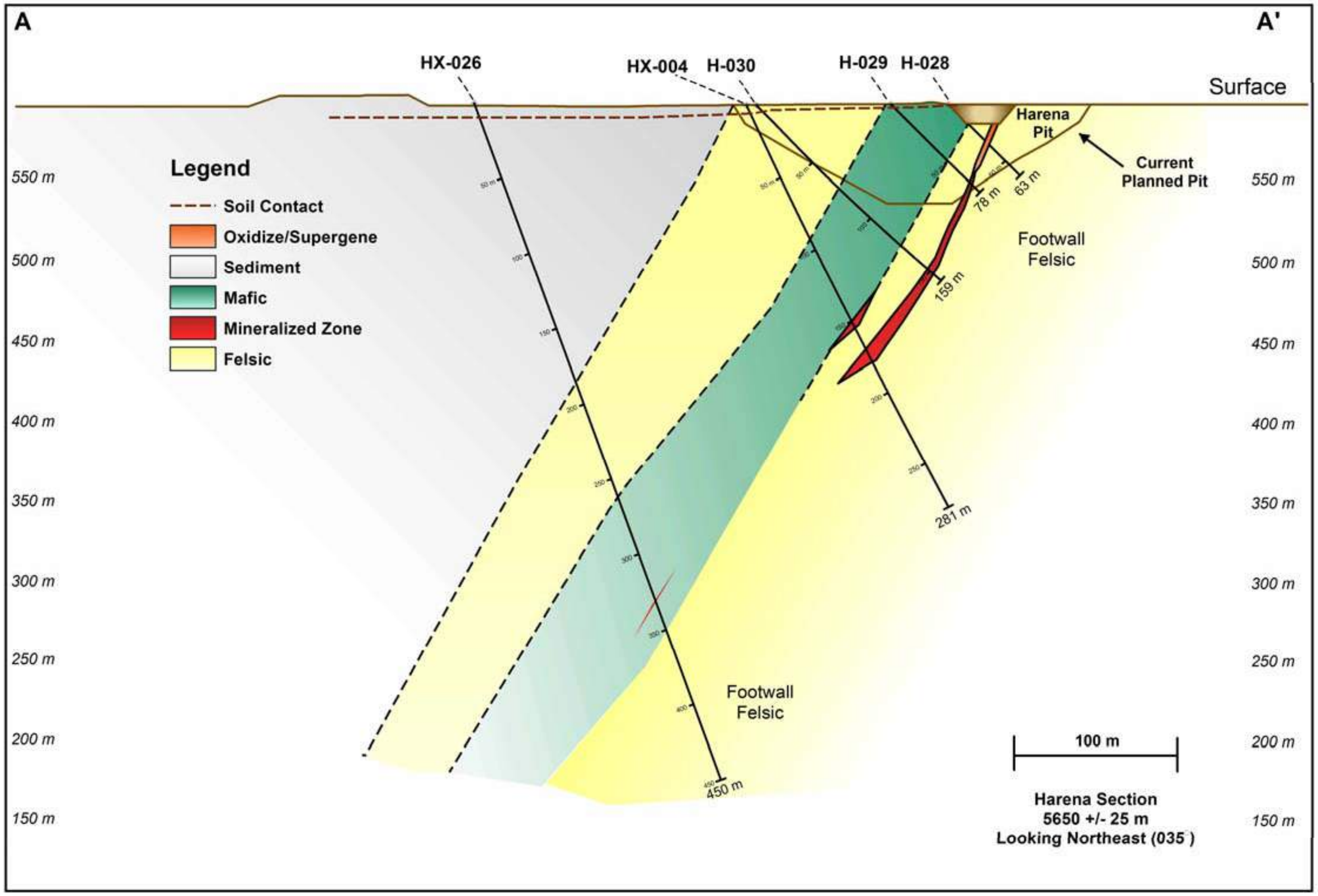
Stratigraphic Section A – A’



Section L5650 section A-A’ – (viewing NE 035deg Az.)

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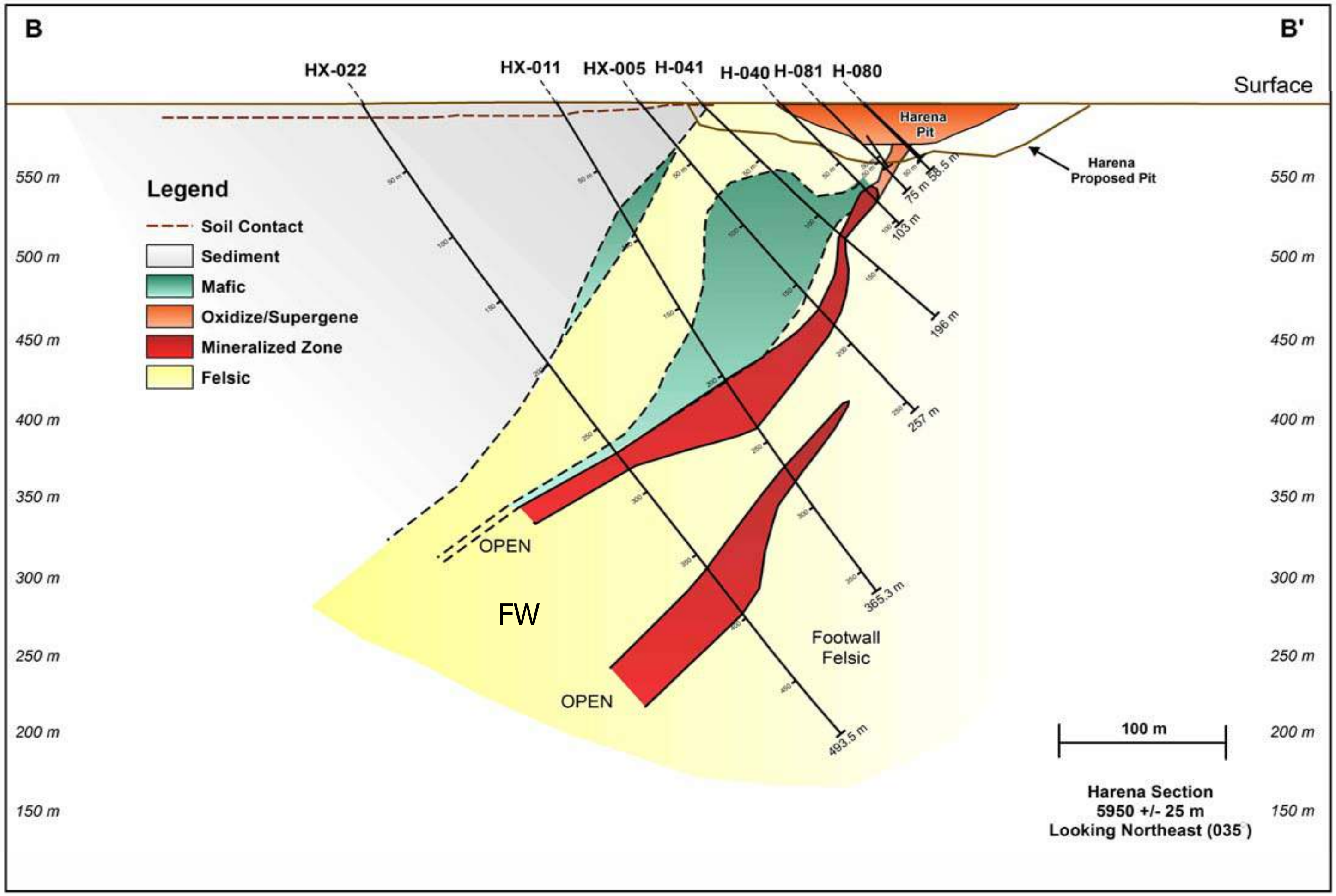
Stratigraphic Section B – B'



Section L5950 section B-B' – (viewing NE 035deg Az.))

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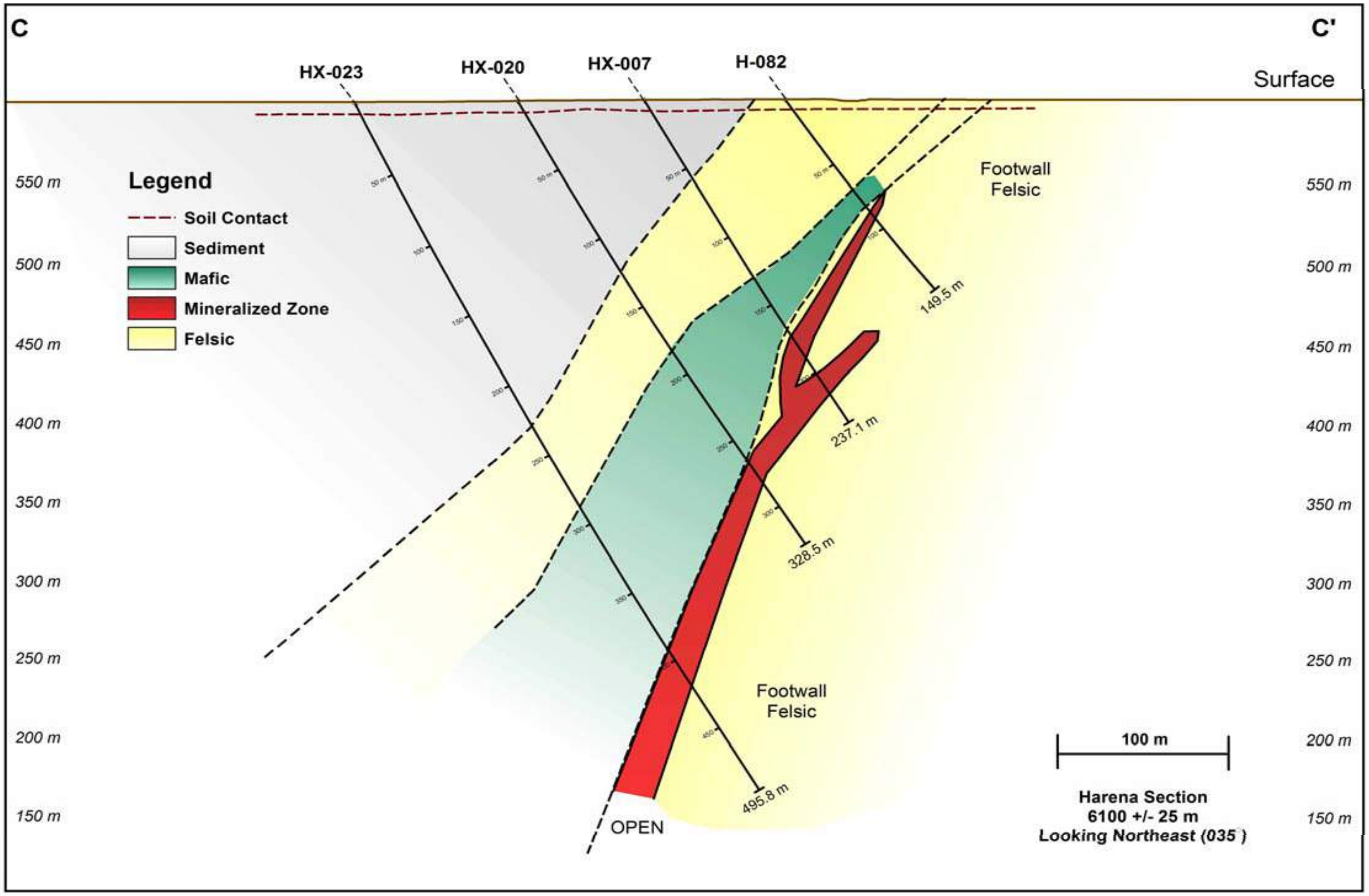
Stratigraphic Section C – C’



Section L610 section C-C’ – (viewing NE 035deg Az.)

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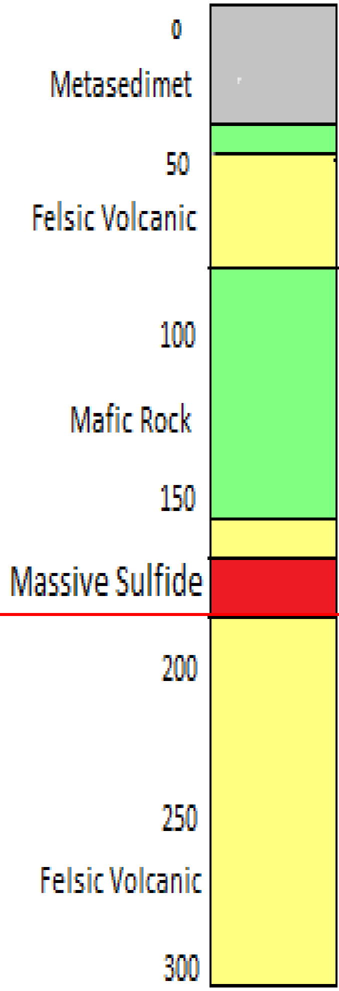
Hole HX-005 Stratigraphy



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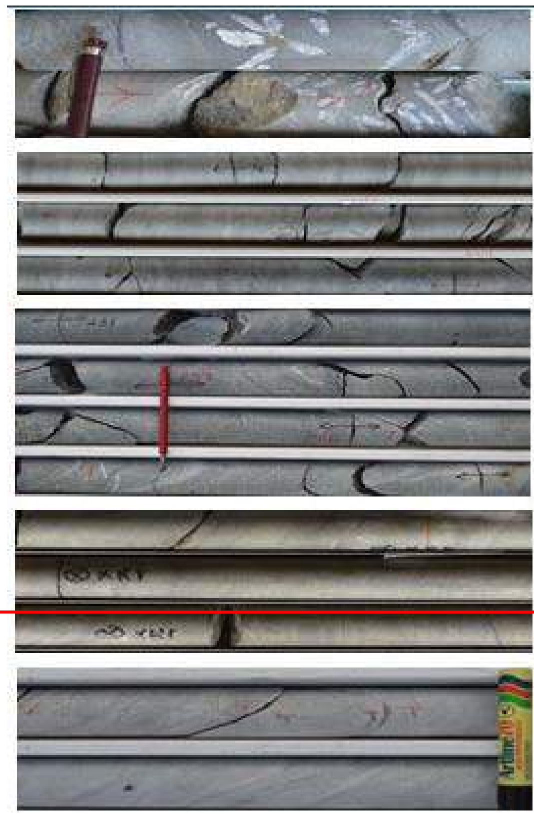

Meta-sediments with andalusite porphyroblasts

Hangingwall felsics

Mafic units

Massive Sulphide

Footwall felsics

Columnar stratigraphic section, DDH HX-005

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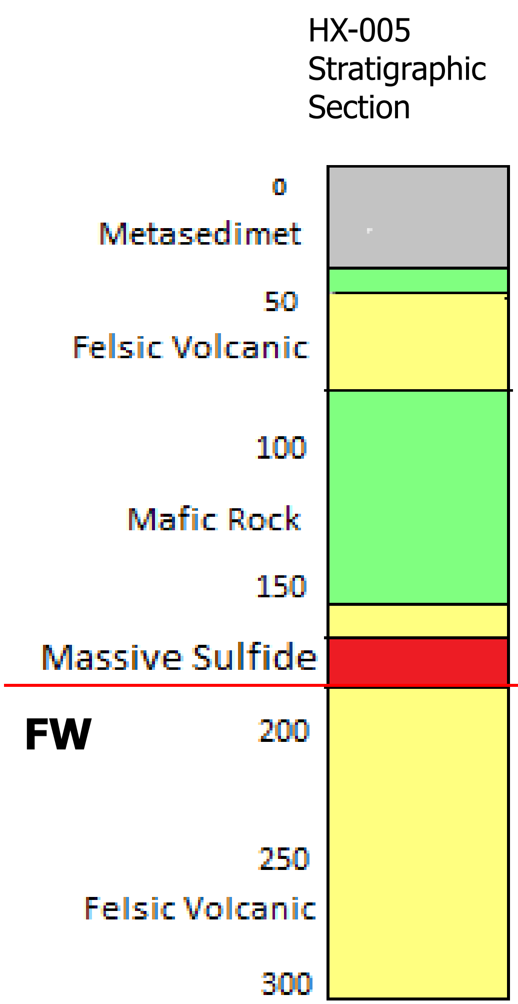
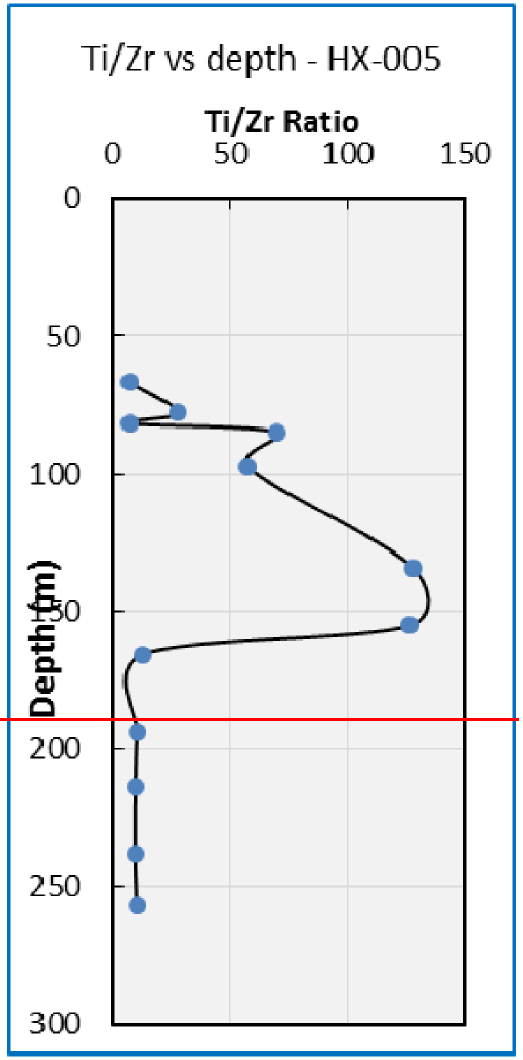
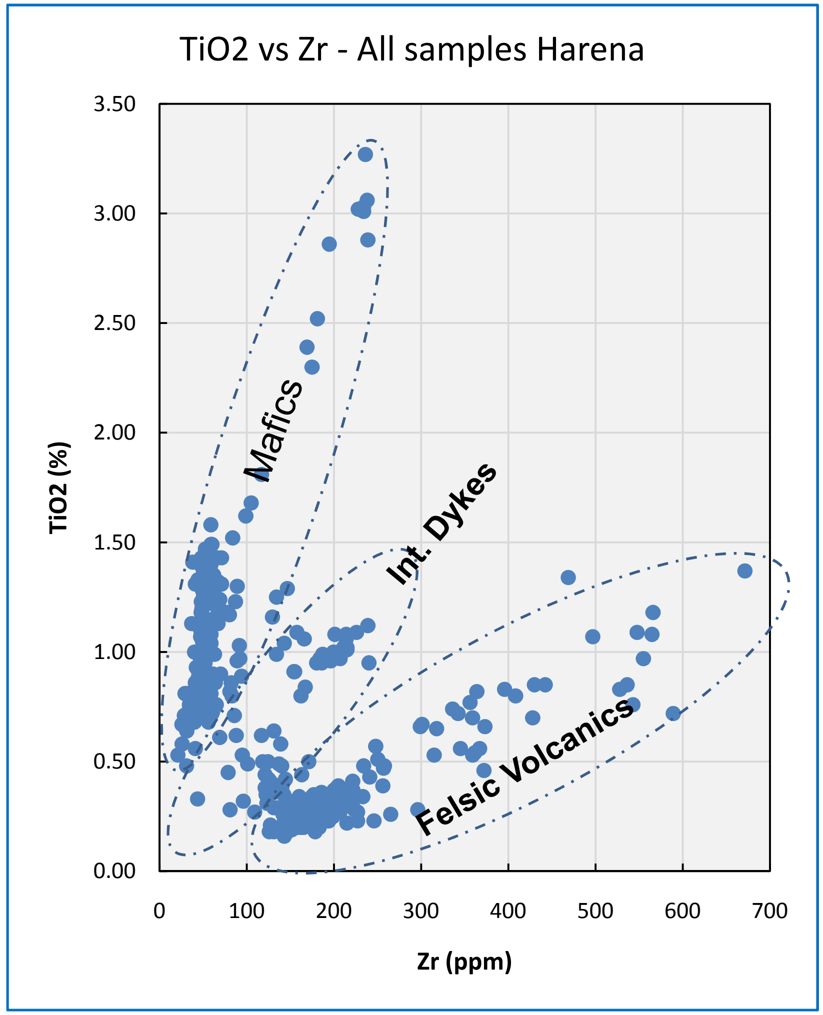
TiO2 vs Zr – Rock Types







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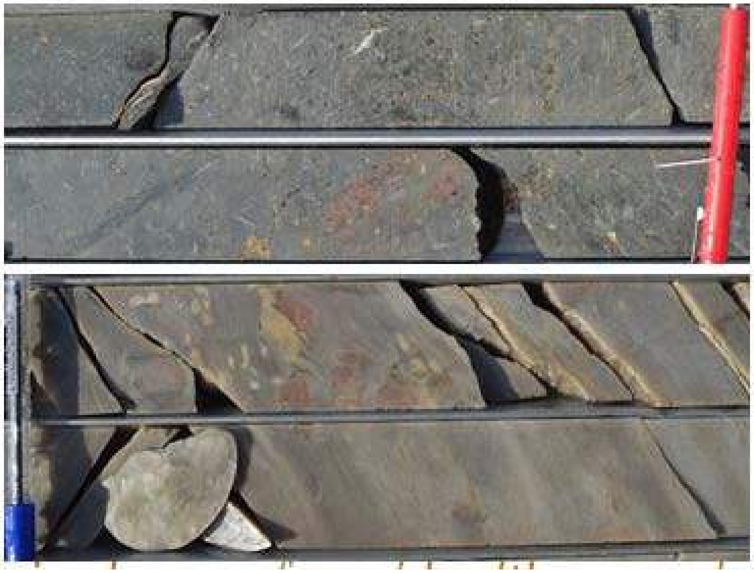
Hydrothermal Alteration

HANGINGWALL ALTERATION

- Silica-Sericite +/- chlorite, biotite alteration is occurred in Felsic volcanic rocks
- Silica-Chlorite +/- biotite alteration in Mafic rocks

FOOTWALL ALTERATION

- Proximal- Intense Aluminous (Chlorite-Sericite-Sillimanite) -- alteration exists within the immediate footwall Has the most intense degree of hydrothermal alteration
- Distal- Moderate to strong Silica-Sericite +/- Biotite alteration exists beneath the immediate footwall



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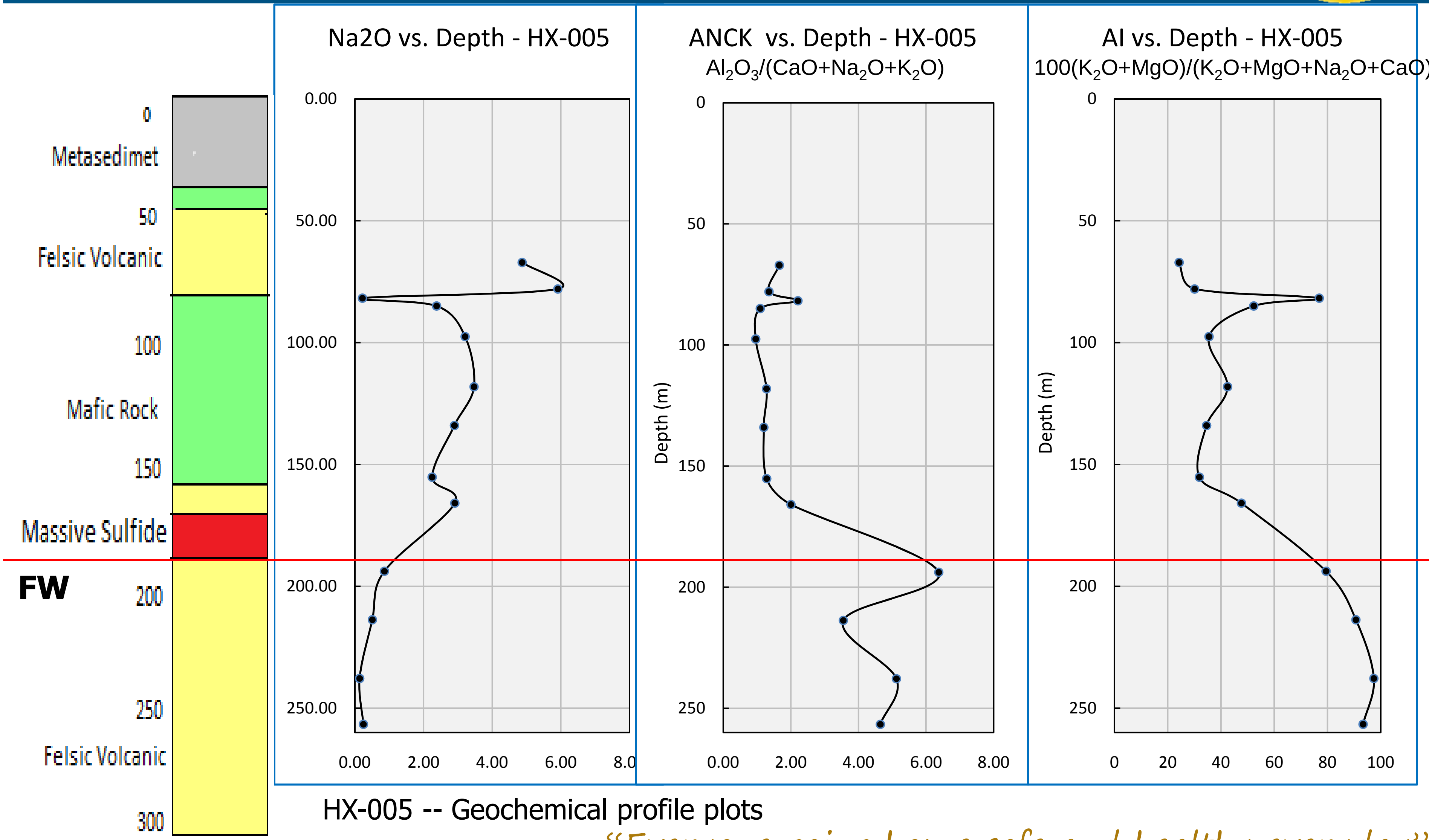
Hydrothermal Alteration Indexes



HX-005 -- Geochemical profile plots

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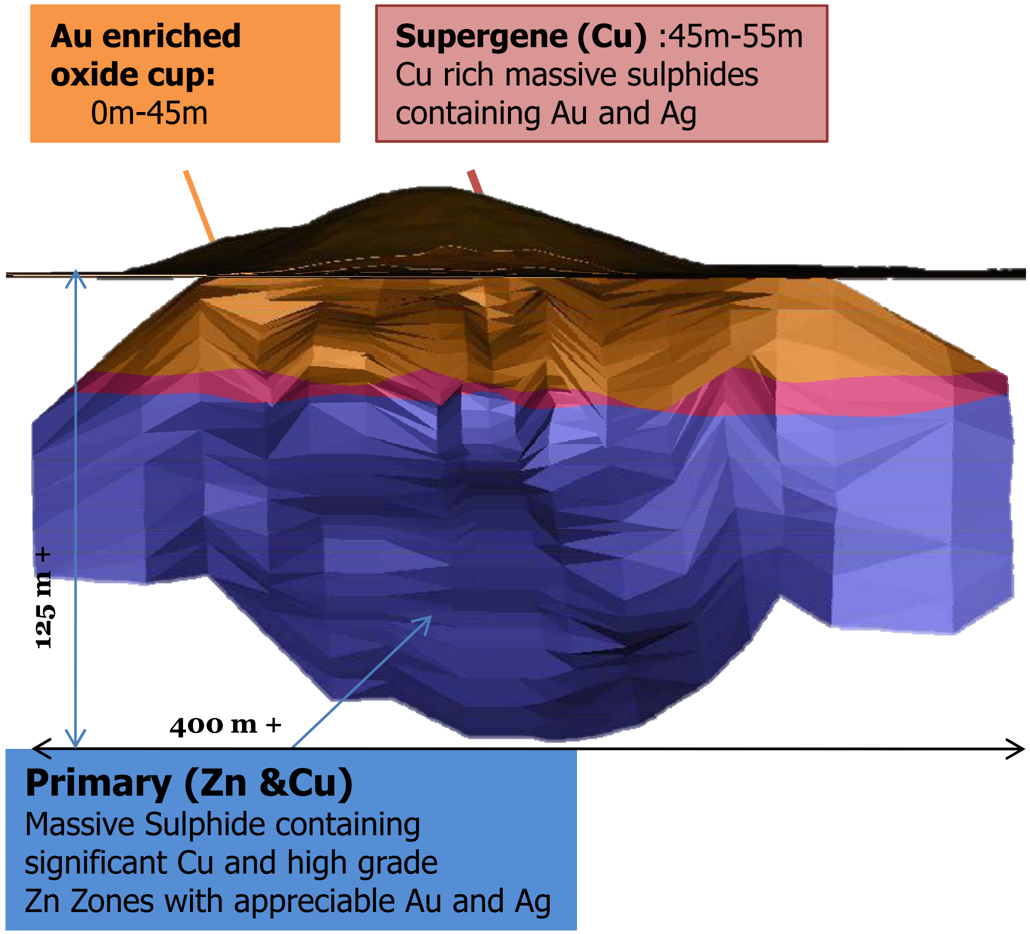
Mineralization



3D Isometric view from April 2012 BMSC report

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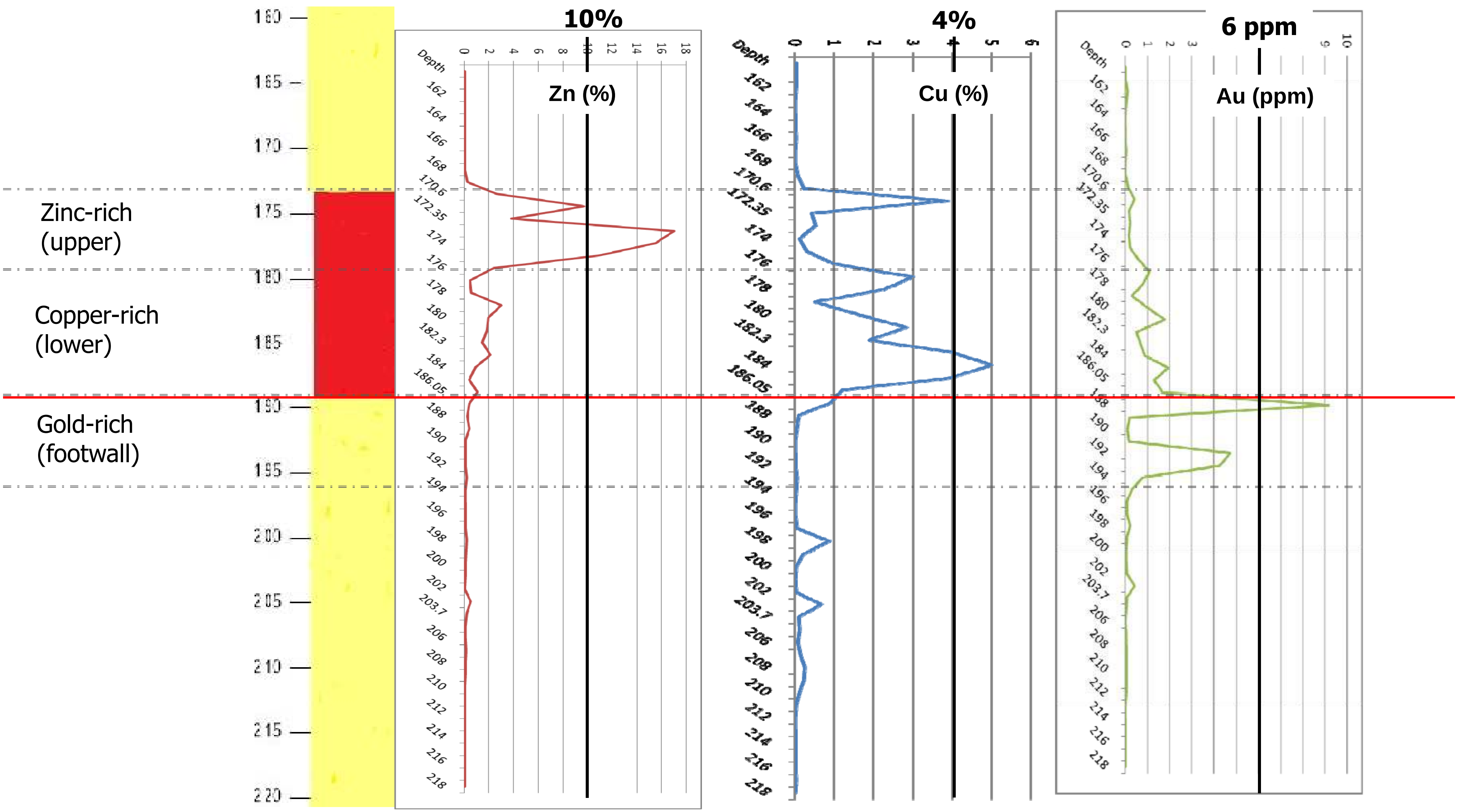
Metal Zoning



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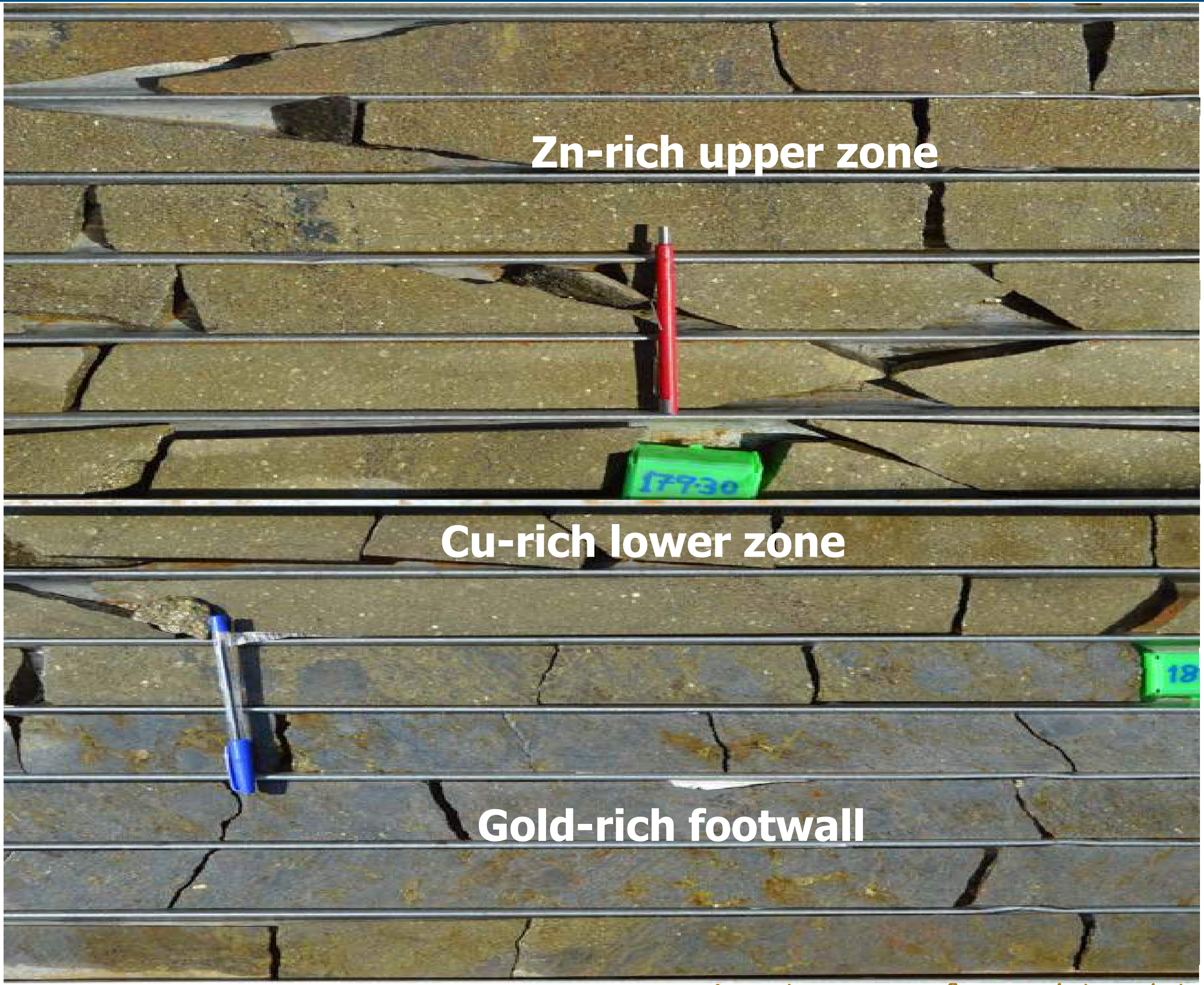
Hole HX-005



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Conclusions

- There are three main Lithological units showing relatively consistent stratigraphy
- Sequences dipping to the NW
- The rocks are clearly affected by faults and small scale folds; their size and orientation is not yet clearly defined and will be studied under the ongoing exploration activities.
- Hangingwall and footwall alterations are distinctively identified and are characteristically indicative for targeting the mineralized zones
- The primary sulphide zone shows further Zn, Cu, And Au zoning
- Immediate footwall zone has significant gold results

2014 BMSC Exploration Team

ay''

Mineralogy & Lithogeochemistry of the Weathering Zone and Gossan over the Bisha Zn-Cu-Au Volcanic-Hosted Massive Sulphide Deposit, Eritrea

Cliff Stanley, Kacper Halama
Dept. of Earth & Environmental Science
Acadia University, Wolfville, Nova Scotia, B4P 2R6, Canada
cliff.stanley@acadiau.ca

Asmara Geo-Congress - Sept./Oct. 2014

Resources

(Probable Reserves as of Oct. 4, 2011)

Oxide Gossan: 4.65 M tonnes; 7.06 g/t Au, 29.56 g/t Ag
Supergene: 7.38 M tonnes; 0.77 g/t Au, 32.68 g/t Ag, 6.35% Cu
Hypogene: 16.28 M tonnes; 0.72 g/t Au, 44.39 g/t Ag, 0.97% Cu, 5.40% Zn

Overall: ***28.31 M tonnes (indicated)***
Now (2014): ***41.22 M tonnes (indicated)***

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Overall: ***28.31 M tonnes (indicated)***
Now (2014): ***41.22 M tonnes (indicated)***

Problems

What is the mineralogy &
geochemistry of this gossan,
in profile ?

Why is gossan Au grade 10 times
higher than hypogene grade ?

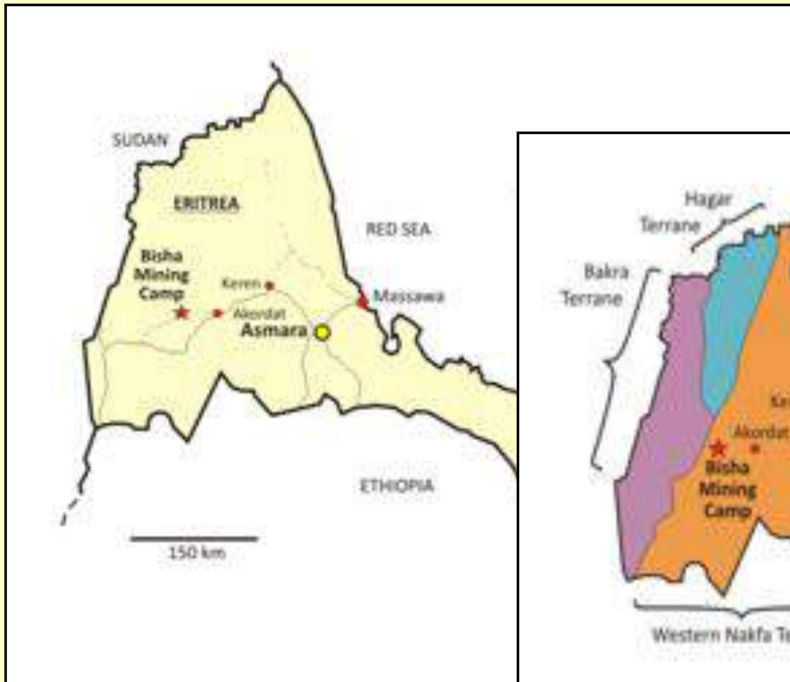
Why is there anomalous Pb in the
supergene zone ?

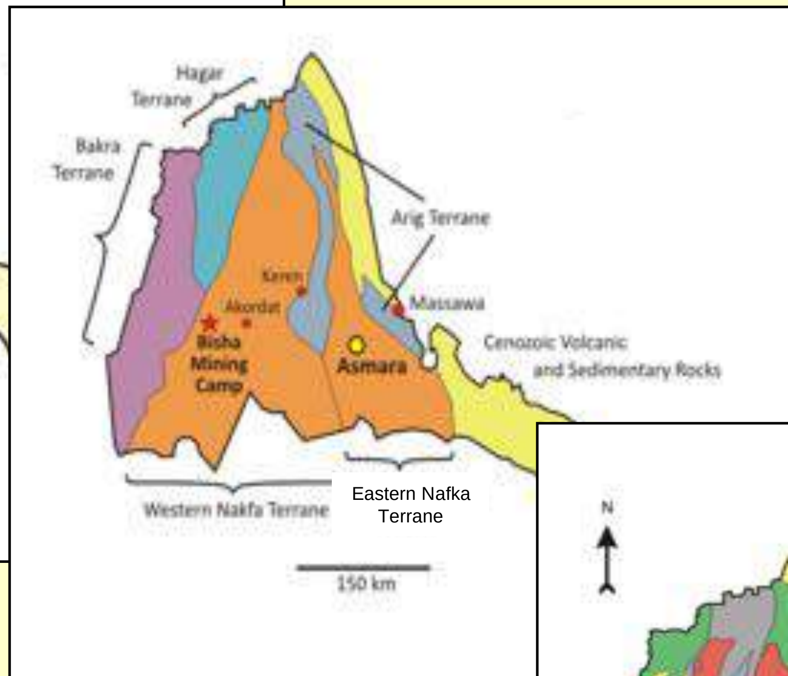
auriferous gossan ore loaded for processing

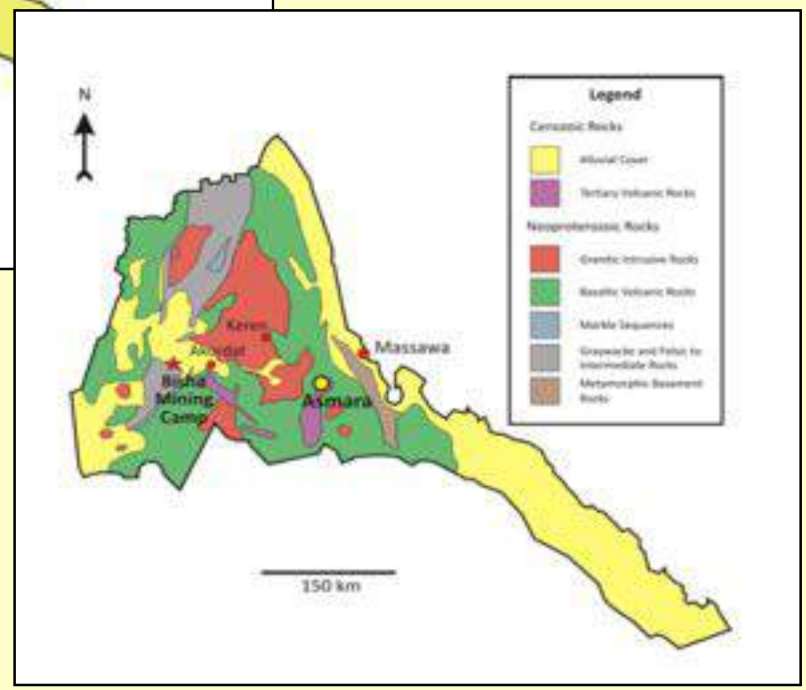
oblique air photo of recessively weathering gossan before mining

gold dore from first pour, 2011

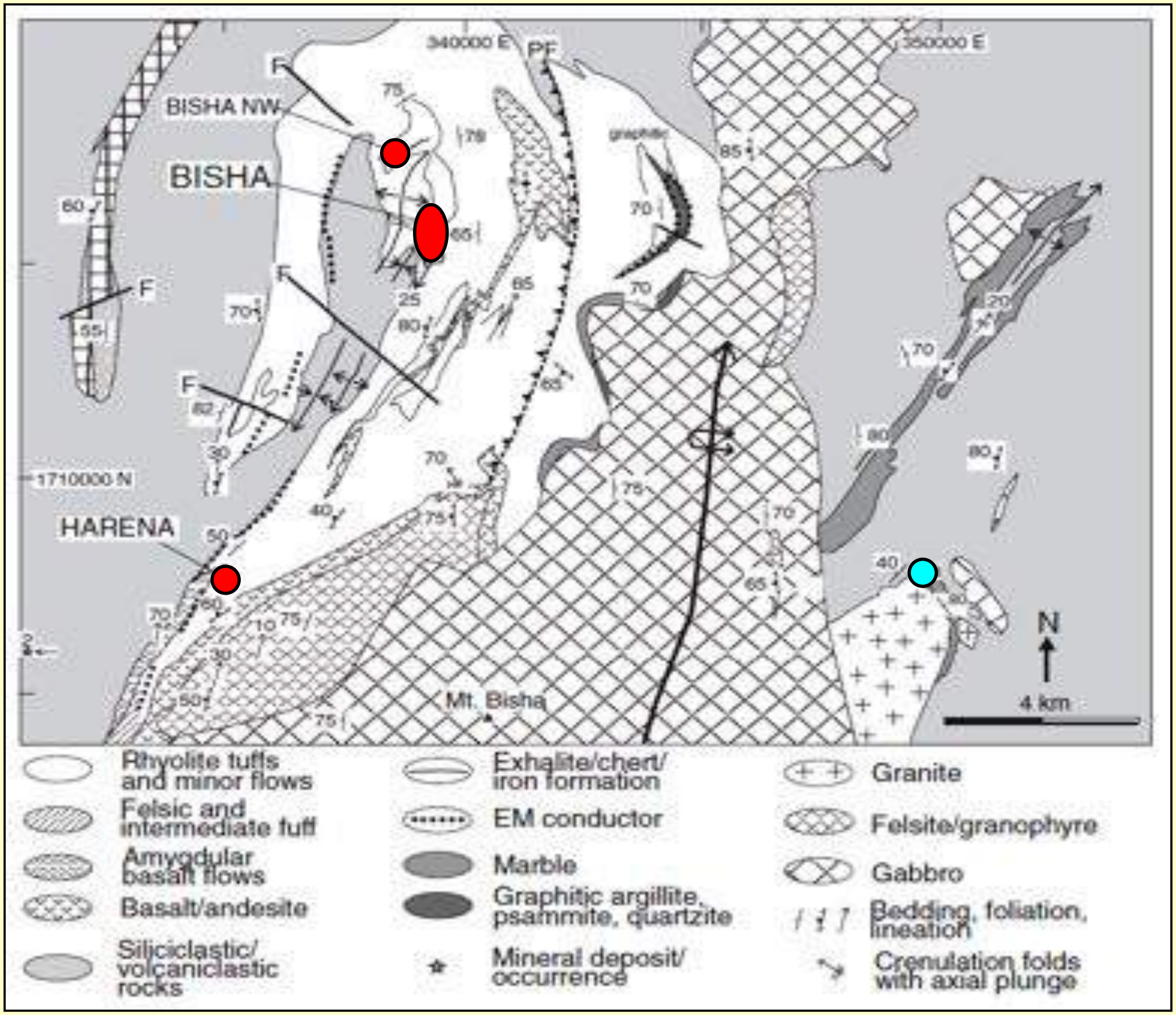
Regional Geology







Local Geology



Hambok

Data Collected

- Open Pit Observations & Limited Mapping
- Drill Core Logs
  - ***Proximal weathering profile:*** gossan, siliceous gossan, acid leach, supergene Cu, supergene Pb, hypogene Cu/Zn zones
  - ***Distal weathering profile:*** saprolite, unweathered host rocks
- Lithogeochemistry
  - Fusion ICP/AES & ICP/OES analysis for major & trace elements
  - Leco analysis for total C and S
- X-Ray Diffraction
  - Smear mount of pulverized material from geochemical analysis
  - Regression of essential minerals against lithogeochemistry to determine mineral modes
- Magnetic Susceptibility & pH Measurements
  - on pulverized lithogeochemical samples

Fe-oxy-hydroxide minerals

2 $Fe(OH)_3$ => 2 FeO.OH + 2 H_2O => Fe_2O_3 + 3 H_2O

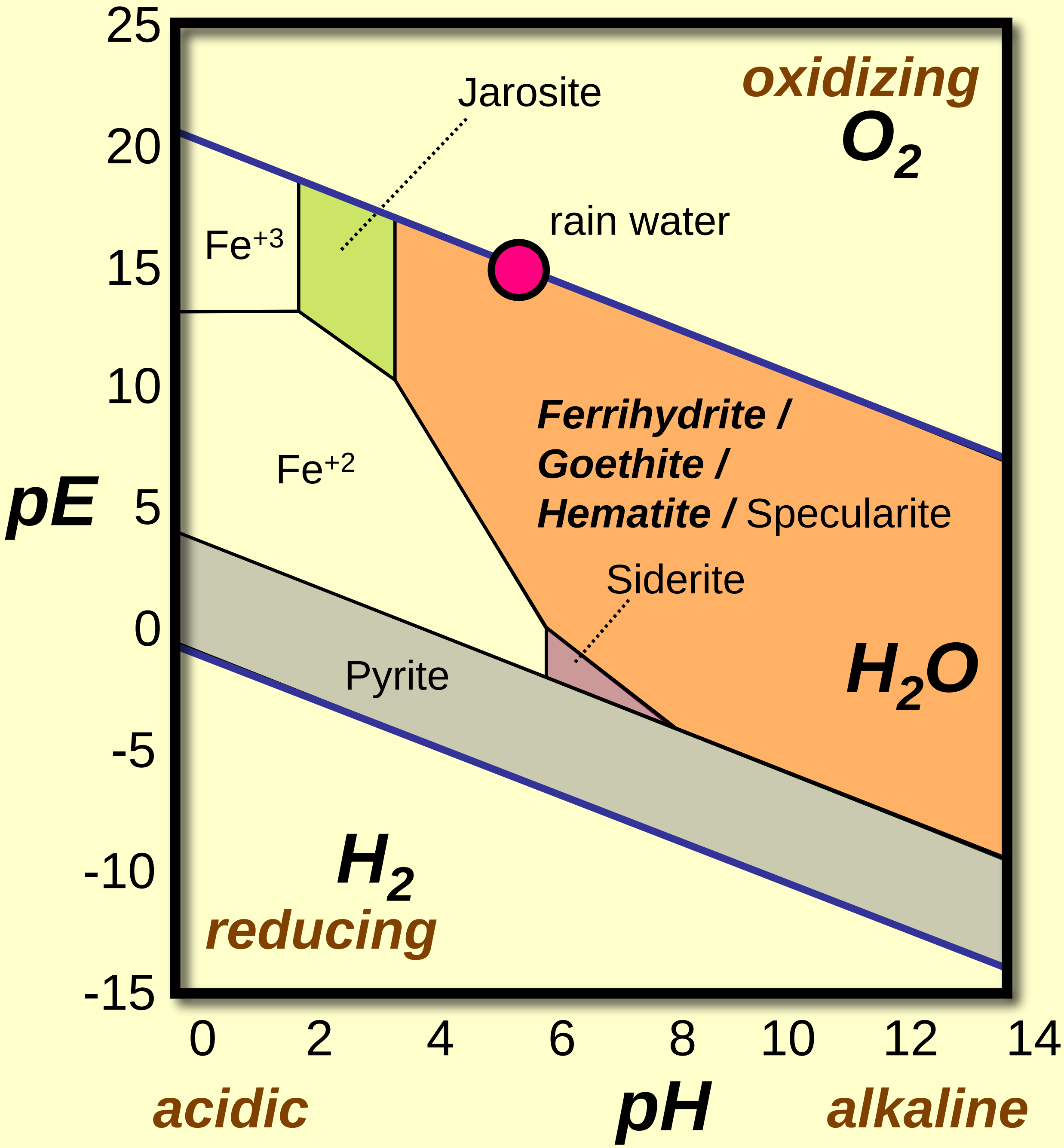
2 Ferrihydrite => 2 Goethite + 2 H_2O => Hematite + 3 H_2O

$$\xrightarrow[\textit{time}]{\textit{dehydration}}$$

Ferrihydrite - $Fe(OH)_3$

Goethite - FeO.OH

Hematite - Fe_2O_3



Ferrihydrite - $Fe(OH)_3$

Goethite - FeO.OH

Hematite - Fe_2O_3

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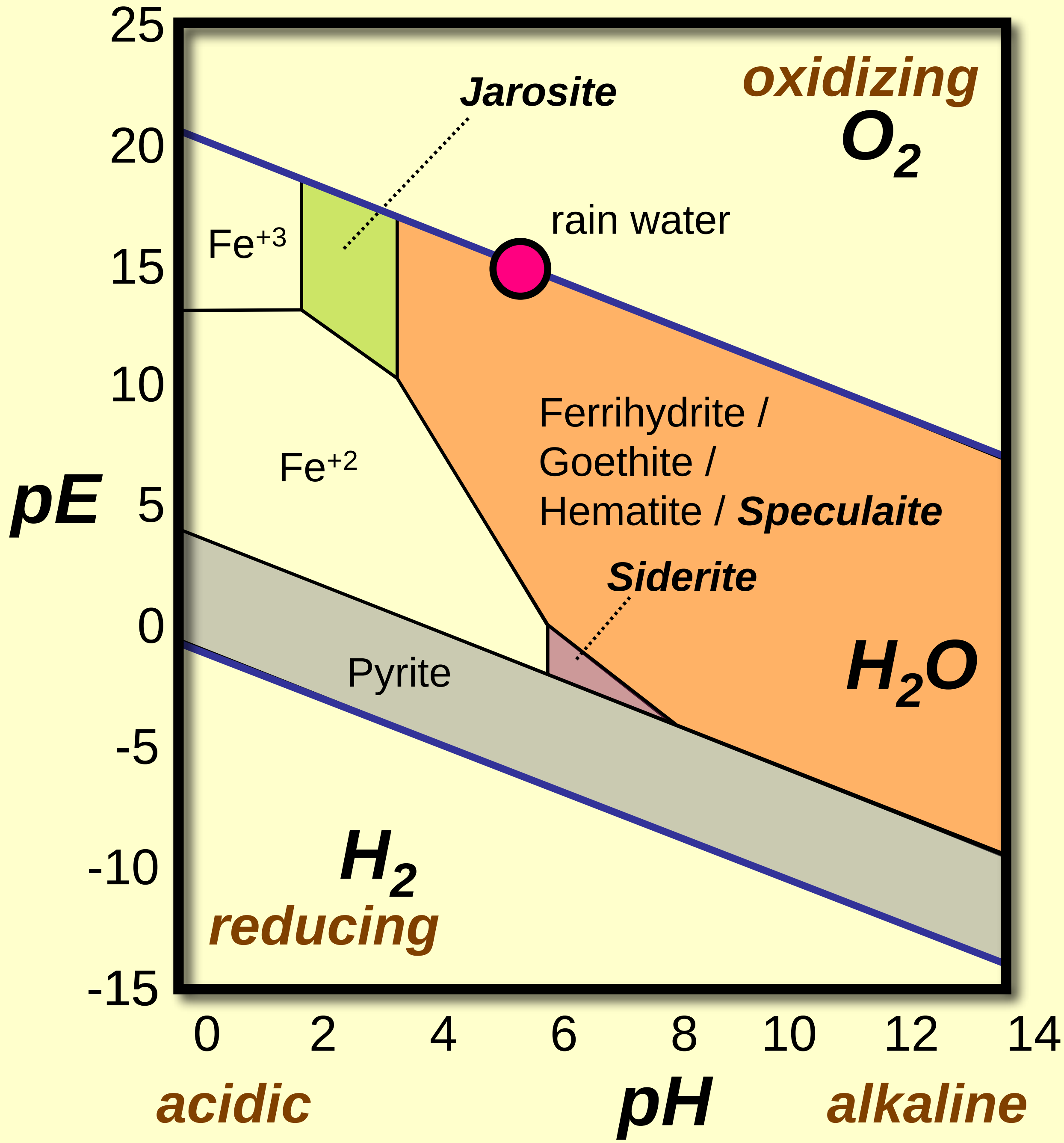
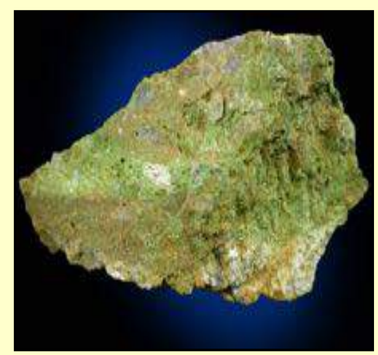


Specularite - Fe_2O_3

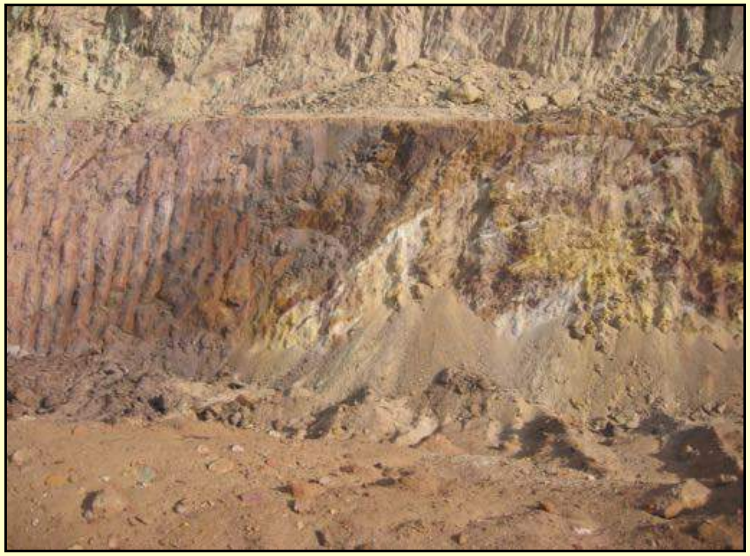
Siderite - $FeCO_3$



Jarosite - $KFe_3(SO_4)_2(OH)_6$

Mapping of Weathering Zones

acid leach zone adjacent to hematitic gossan



acid leach zone adjacent to goethitic gossan

unconformity between gossan & alluvium

typical Fe-oxy-hydroxide gold ore

Mapping of Weathering Zones

porous goethite & ferrihydrite gossan

siliceous acid leach

kaolinitic saprolite

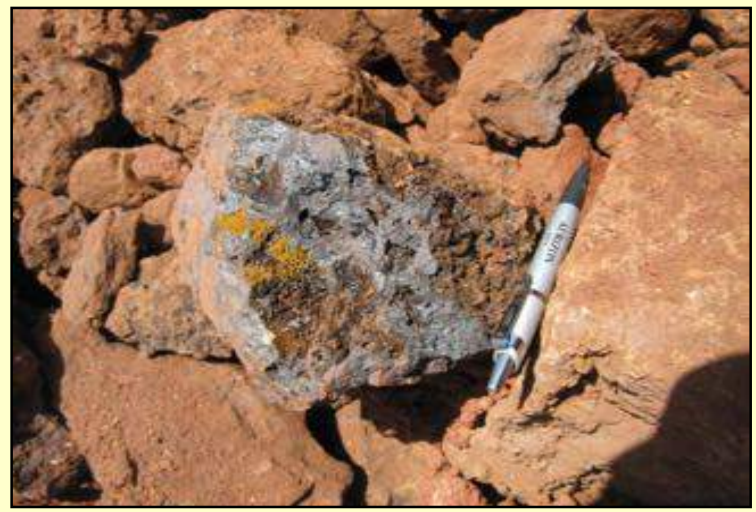
supergene CHAL replacing massive PY

Mapping of Weathering Zones

jarosite-coated gossanous boulder

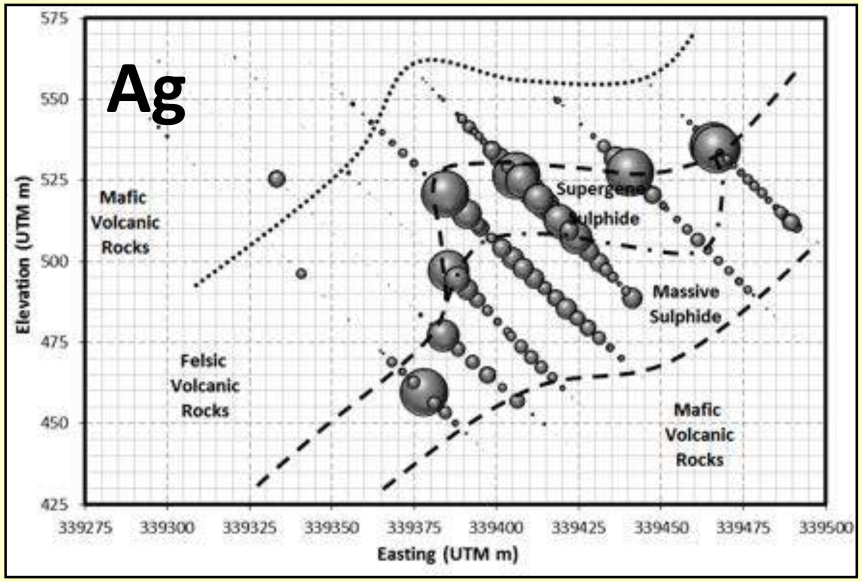
hard, massive (non-porous) specularite

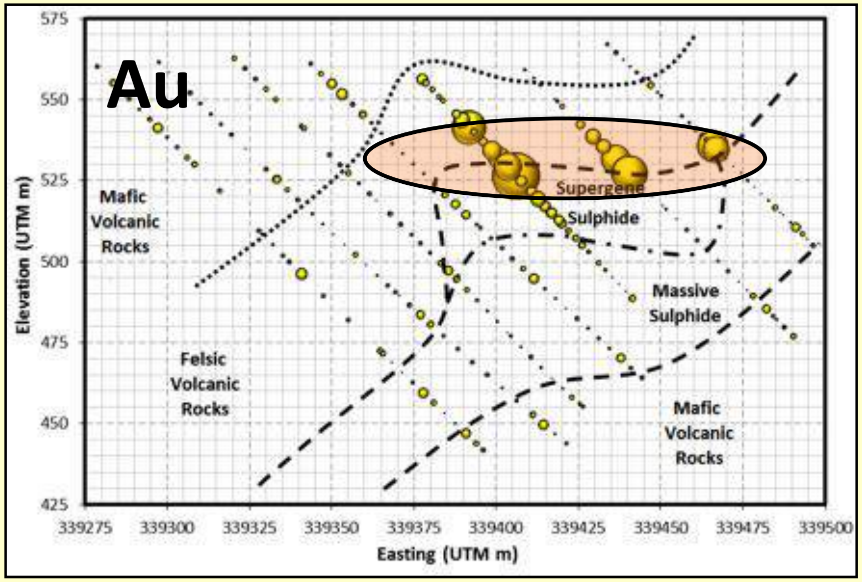
hard, massive specularite gossan

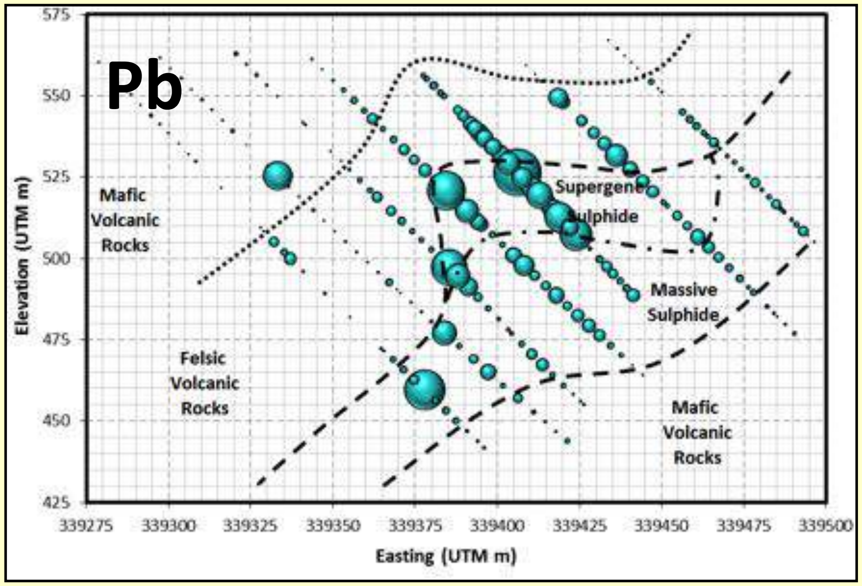


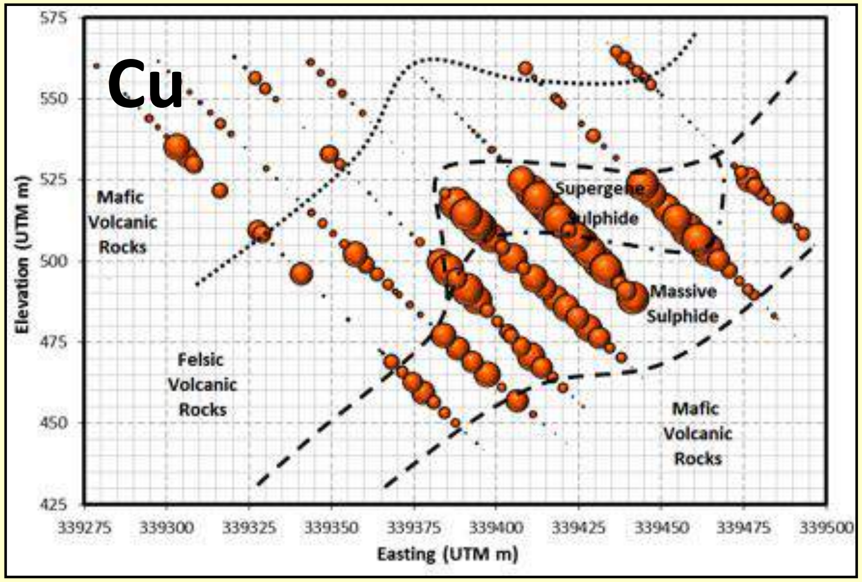
goethite & ferrihydrite boxwork (after PY) with hard, massive specularite

Geochemical Results



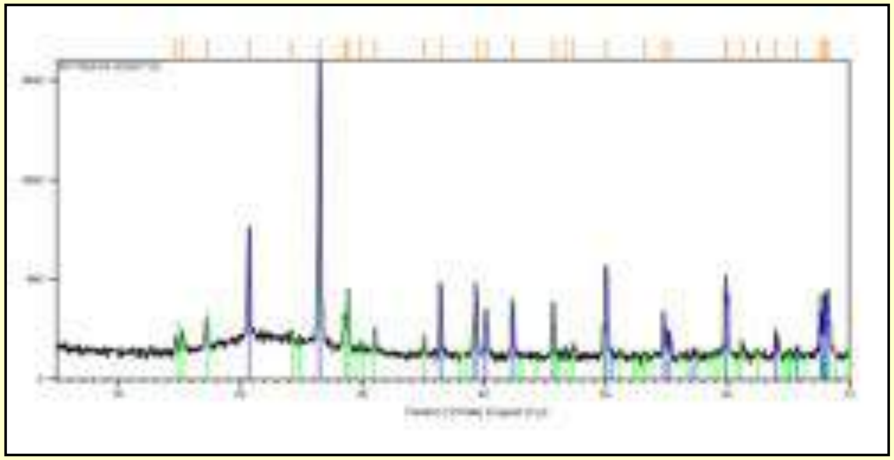




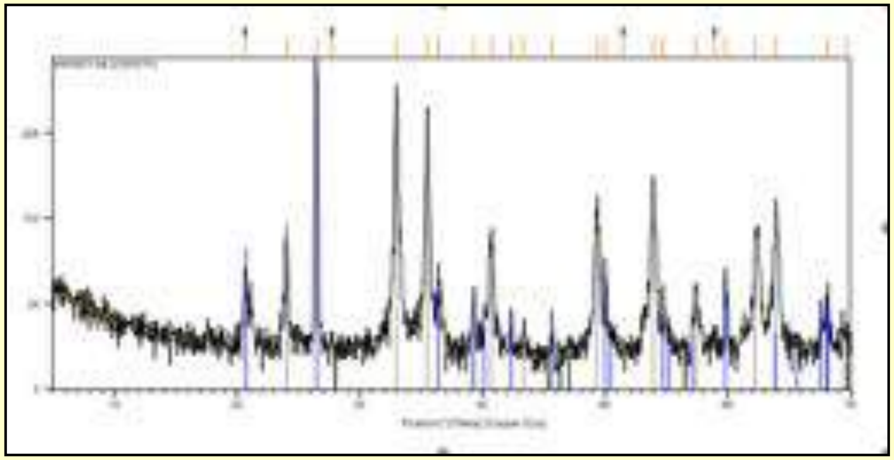


Mineralogical Analysis

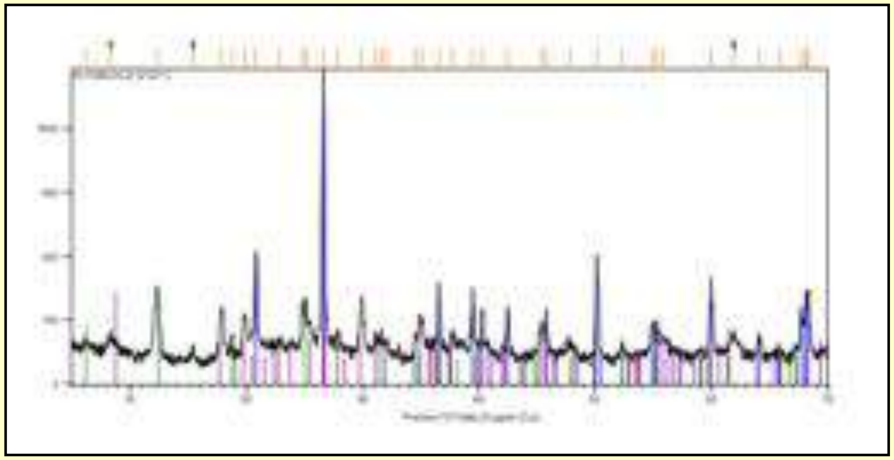
An essential mineral suite (> 5 vol. %) was identified using XRD spectra from several samples of each lithology



acid leach sample # 1922 w/quartz & jarosite



gossan sample # 1601 w/quartz & hematite



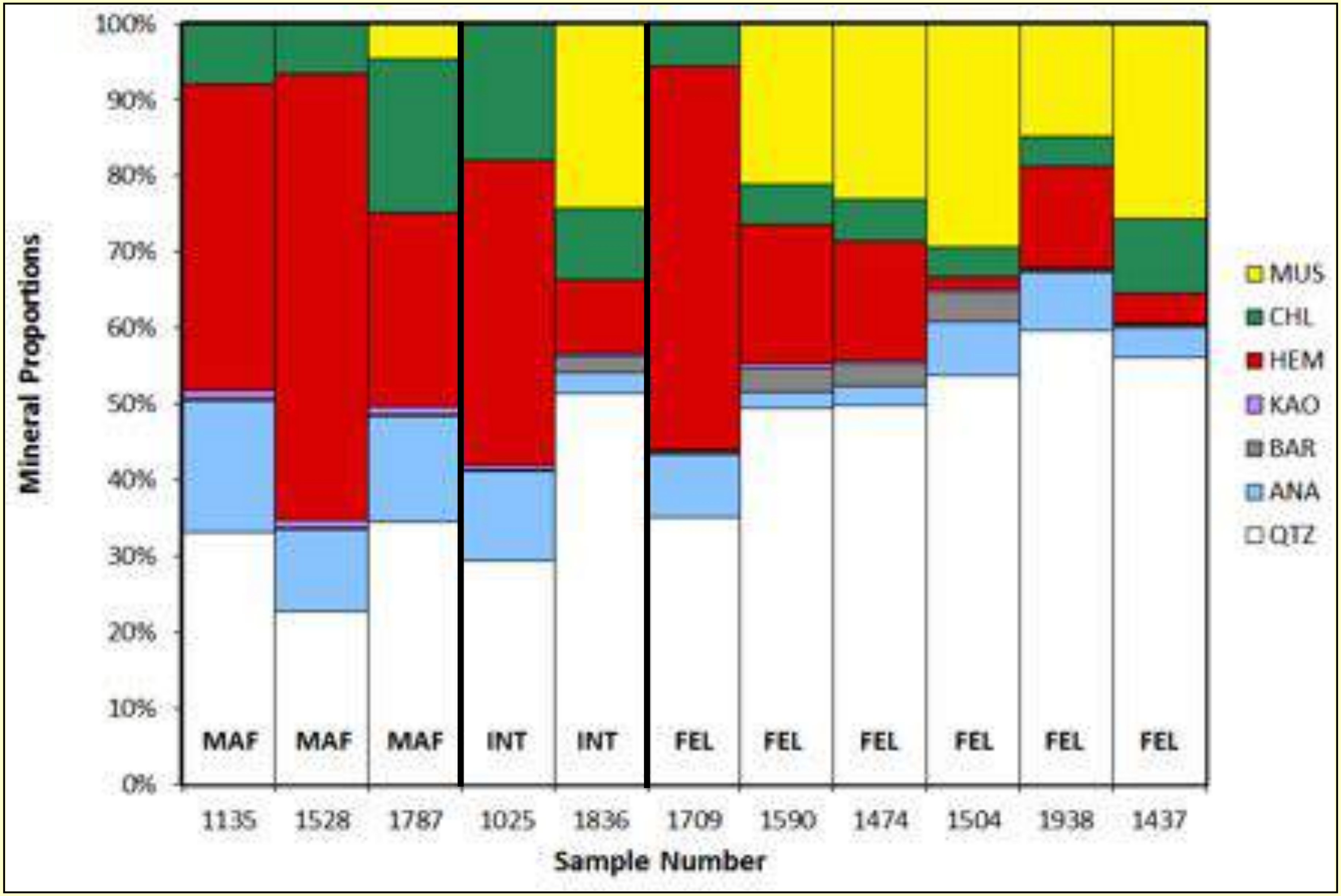
saprolite sample # 1590 w/quartz, muscovite & chlorite

Essential Minerals

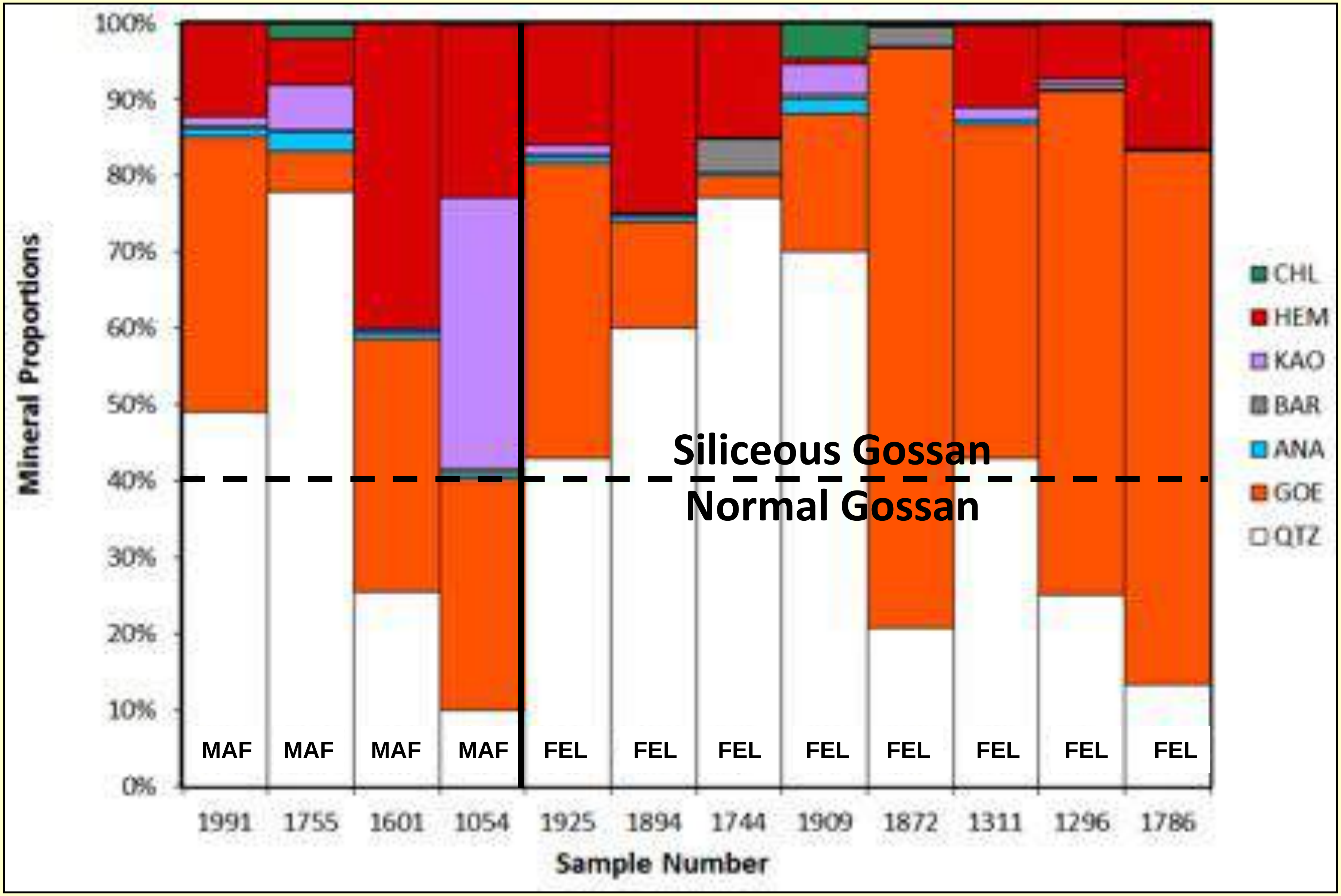
Gossan	- QTZ, GOE, ANA, BAR, KAO, HEM, CHL
Acid Leach	- QTZ, GOE, ***JAR***, BAR, HEM
Saprolite	- QTZ, ANA, BAR, KAO, HEM, ***CHL, MUS***
Supergene	- QTZ, PYR, BAR, DIG, COV, GAL, SID ***{MEL, ROZ, SZO}***
Massive Sulphide	- PYR, SPH, QTZ, CPY, GYP, BAR, COV, DIG, {***CUP, CHAL***}, ***{MEL, ROZ, SZO}***
Unweathered	- QTZ, MUS, CHL, PY, ALU, GYP

Regressed mineral mode estimates were compared with lithogeochemical compositions and validate these quantitative nature of these data

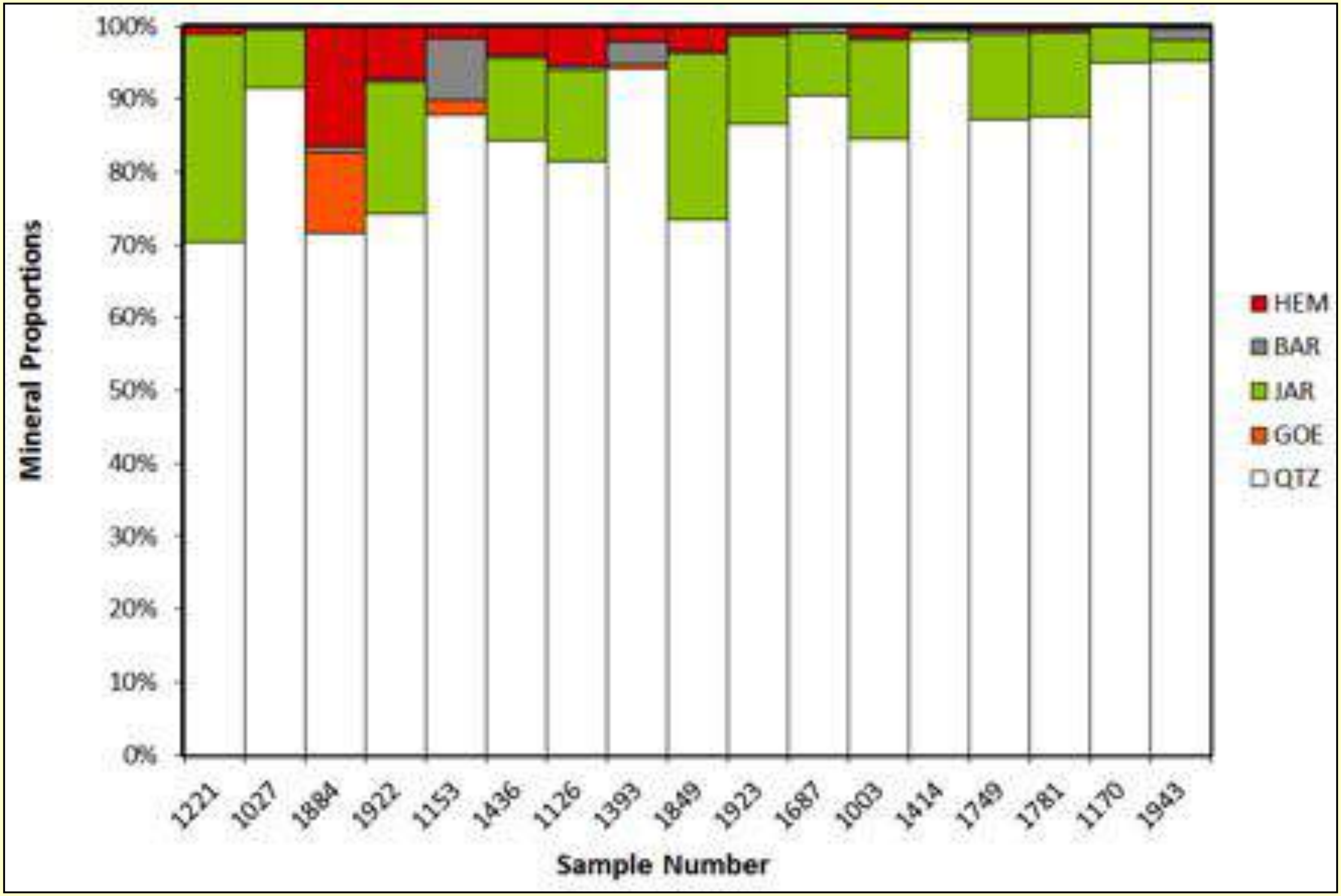
Saprolite


Mineral Proportions
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
MAF
MAF
MAF
INT
INT
FEL
FEL
FEL
FEL
FEL
FEL
1135
1528
1787
1025
1836
1709
1590
1474
1504
1938
1437
Sample Number
MUS
CHL
HEM
KAO
BAR
ANA
QTZ

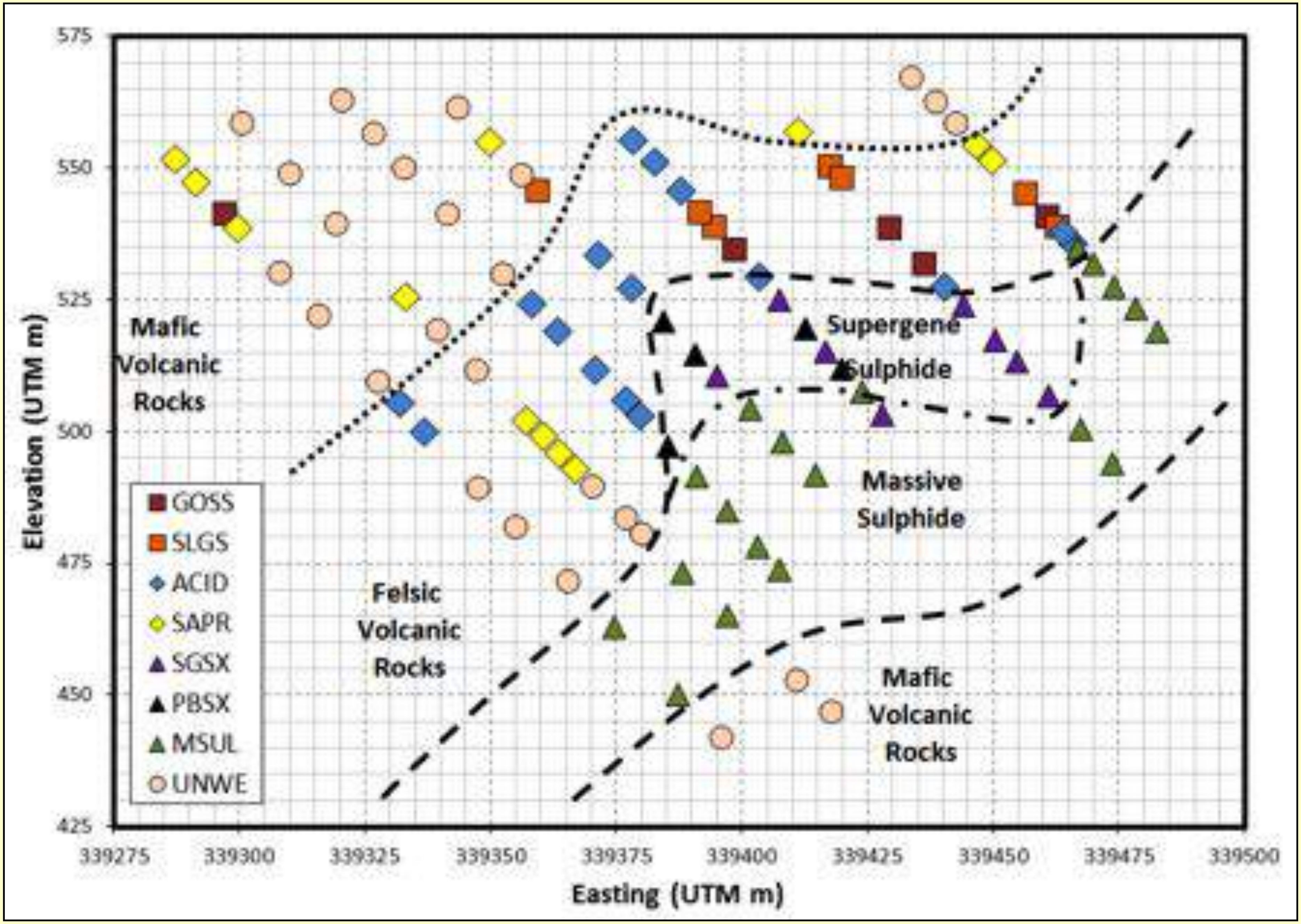
Gossan & Siliceous Gossan



Acid Leach



100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Mineral Proportions
1221
1027
1884
1922
1153
1436
1126
1393
1849
1923
1687
1003
1414
1749
1781
1170
1943
Sample Number
HEM
BAR
JAR
GOE
QTZ


575
550
525
500
475
450
425
Elevation (UTM m)
339275
339300
339325
339350
339375
339400
339425
339450
339475
339500
Easting (UTM m)
Mafic
Volcanic
Rocks
Supergene
Sulphide
Massive
Sulphide
Felsic
Volcanic
Rocks
Mafic
Volcanic
Rocks
GOSS
SLGS
ACID
SAPR
SGSX
PBSX
MSUL
UNWE

Initial Pyrite Oxidation

$$4\,FeS_2 + 15\,O_2 + 10\,H_2O$$
$$\Downarrow pE \qquad => \qquad pH \Downarrow$$
$$4\,FeO.OH + 8\,SO_4^{-2} + 16\,H^+$$

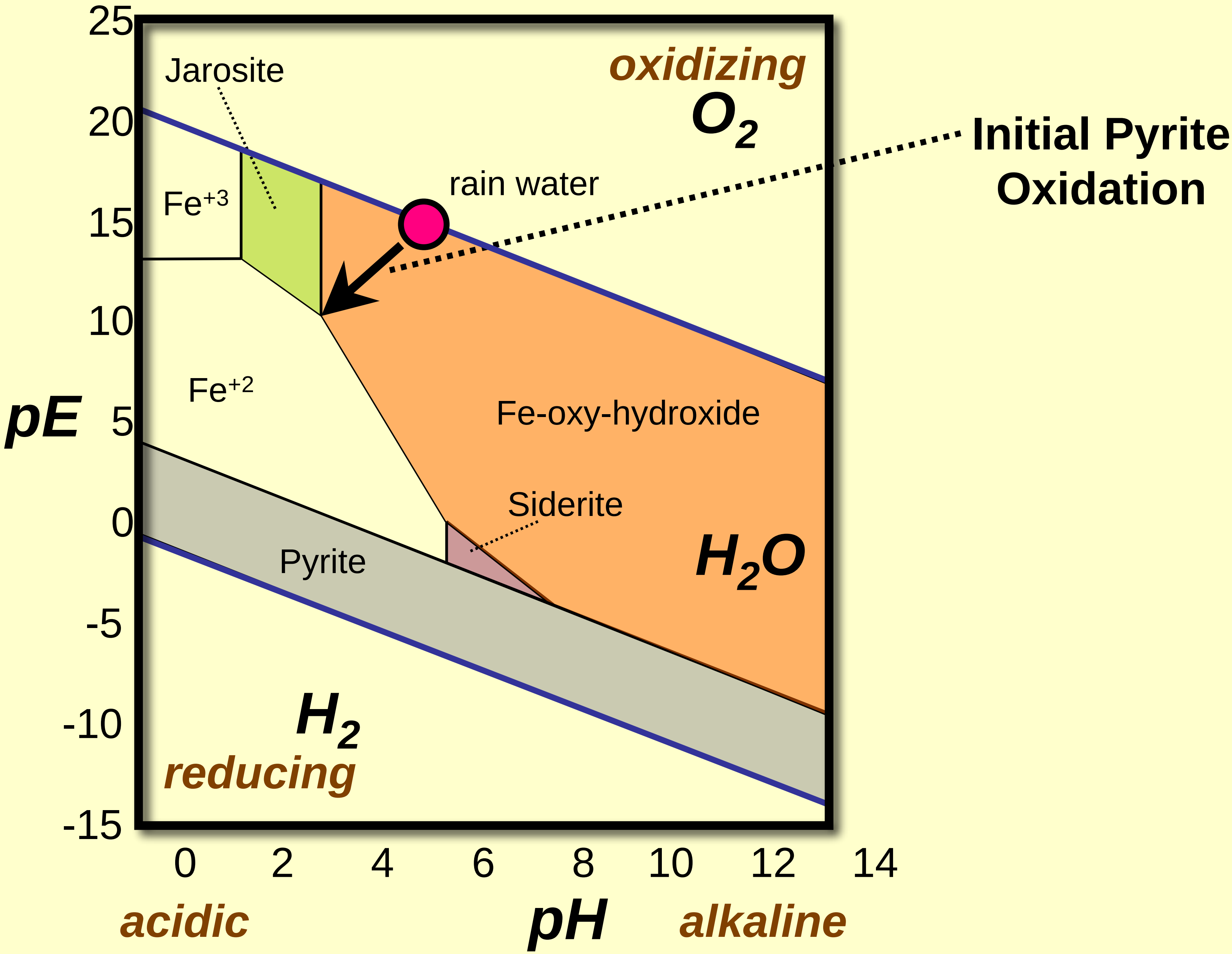
Pyrite:	4 * 119.98 g	=	479.92 g
Goethite:	4 * 88.85 g	=	355.40 g

Pyrite oxidation results in a net material loss & thus produces residual enrichment, but by how much?

0.72 gpt * (479.92/355.40) = **0.97 gpt Au**

Residual Enrichment Alone
Doesn't Explain the 7 gpt Oxide Au Grade !

Requires either/both: Au mobility / Fe or Si removal



25
20
15
10
5
0
-5
-10
-15
pE
Jarosite
oxidizing
O2
Initial Pyrite
Oxidation
rain water
Fe+3
Fe+2
Fe-oxy-hydroxide
Siderite
Pyrite
H2O
H2
reducing
0
2
4
6
8
10
12
14
acidic
pH
alkaline

Example Host Rock Buffering Reaction

$(Fe,Mg)_{10}Al_4Si_6O_{20}(OH)_{16} + 20\ H^+$ pH ↑

$2\ Al_2Si_2O_5(OH)_4 + 2\ SiO_2 + 14\ H_2O + 10\ (Fe,Mg)^{+2}$

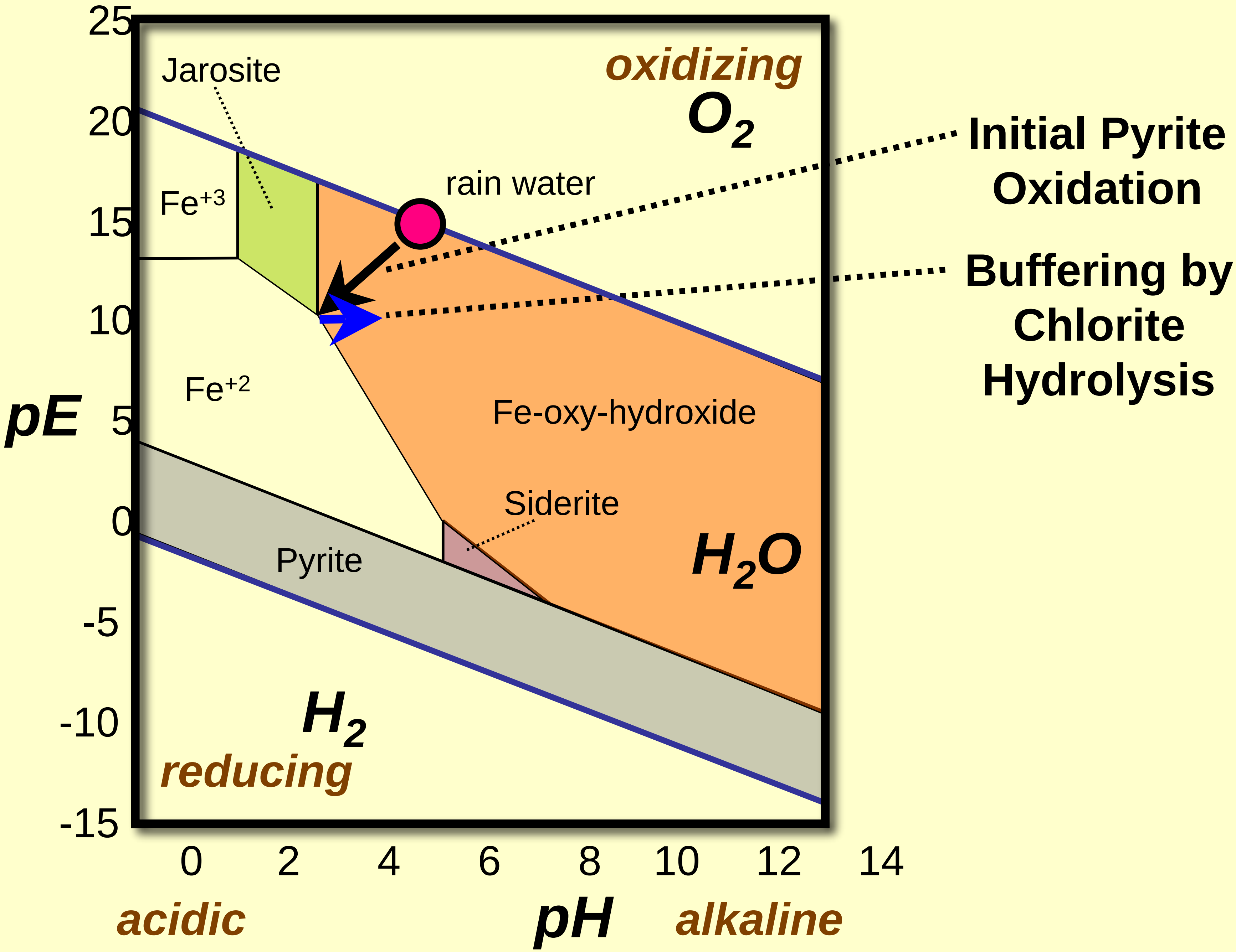
Buffered Hematite Precipitation

$4\ Fe^{+2} + O_2 + 4\ H_2O$

↓ pE

<=>

$2\ Fe_2O_3 + 4\ H^+$ pH ↓



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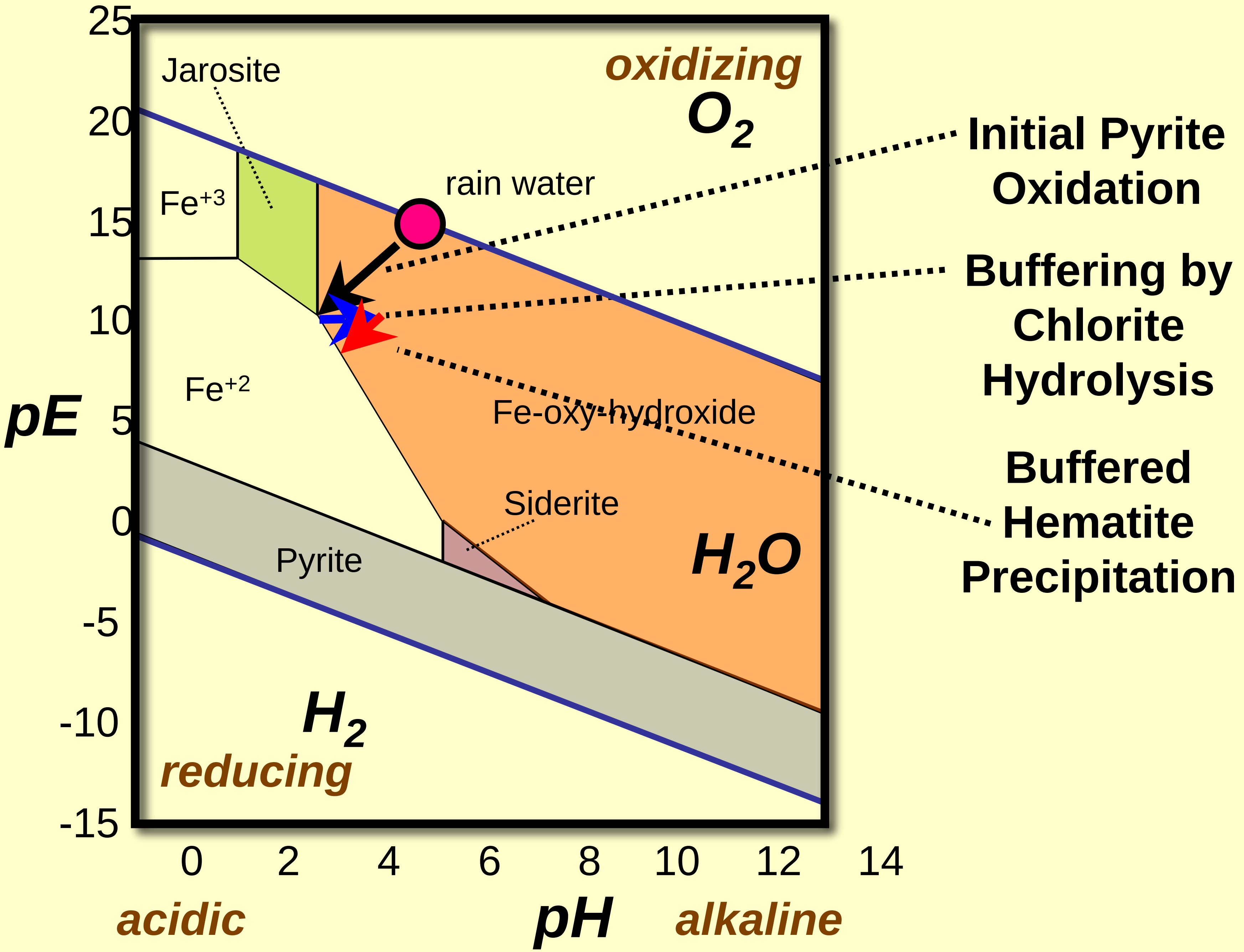
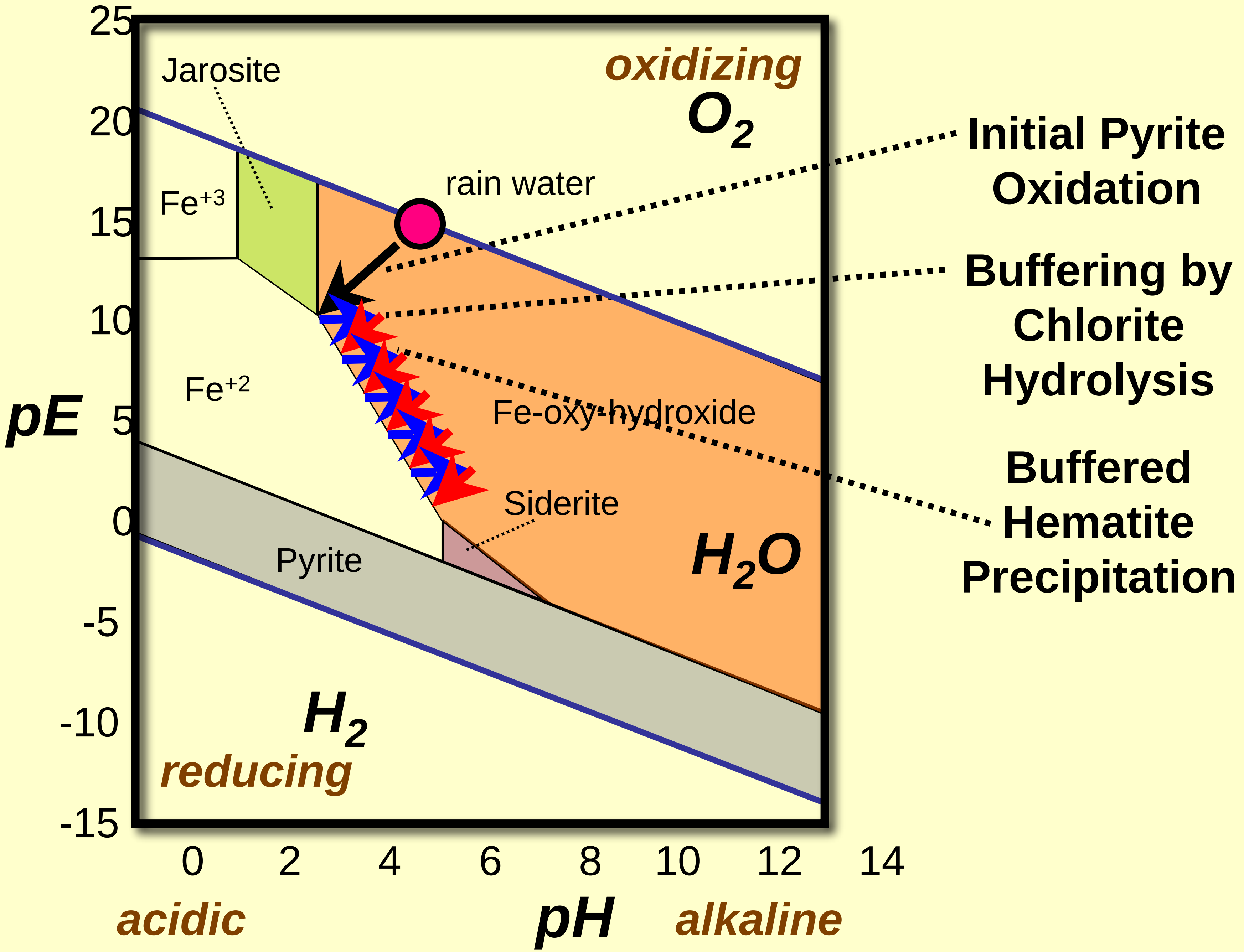
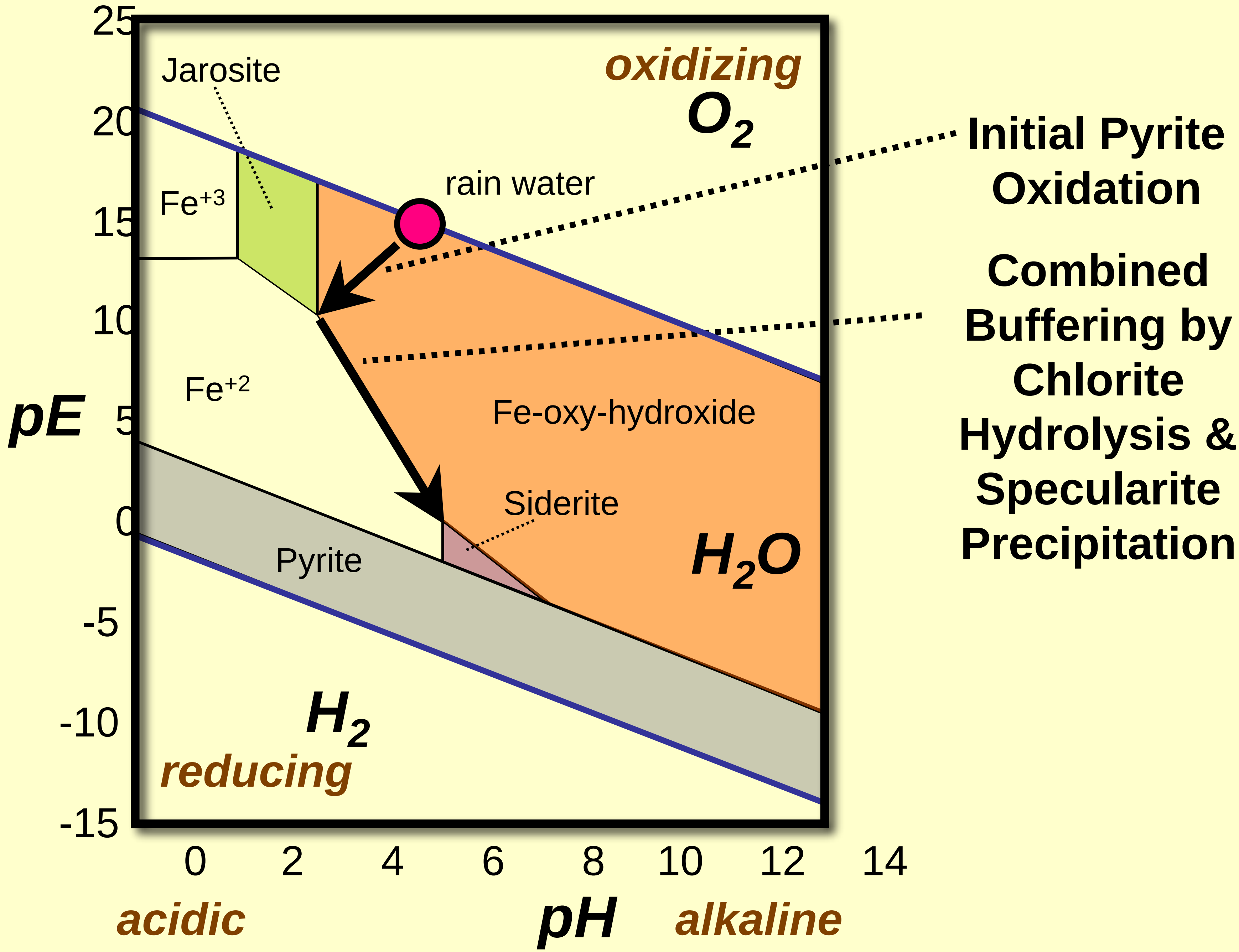
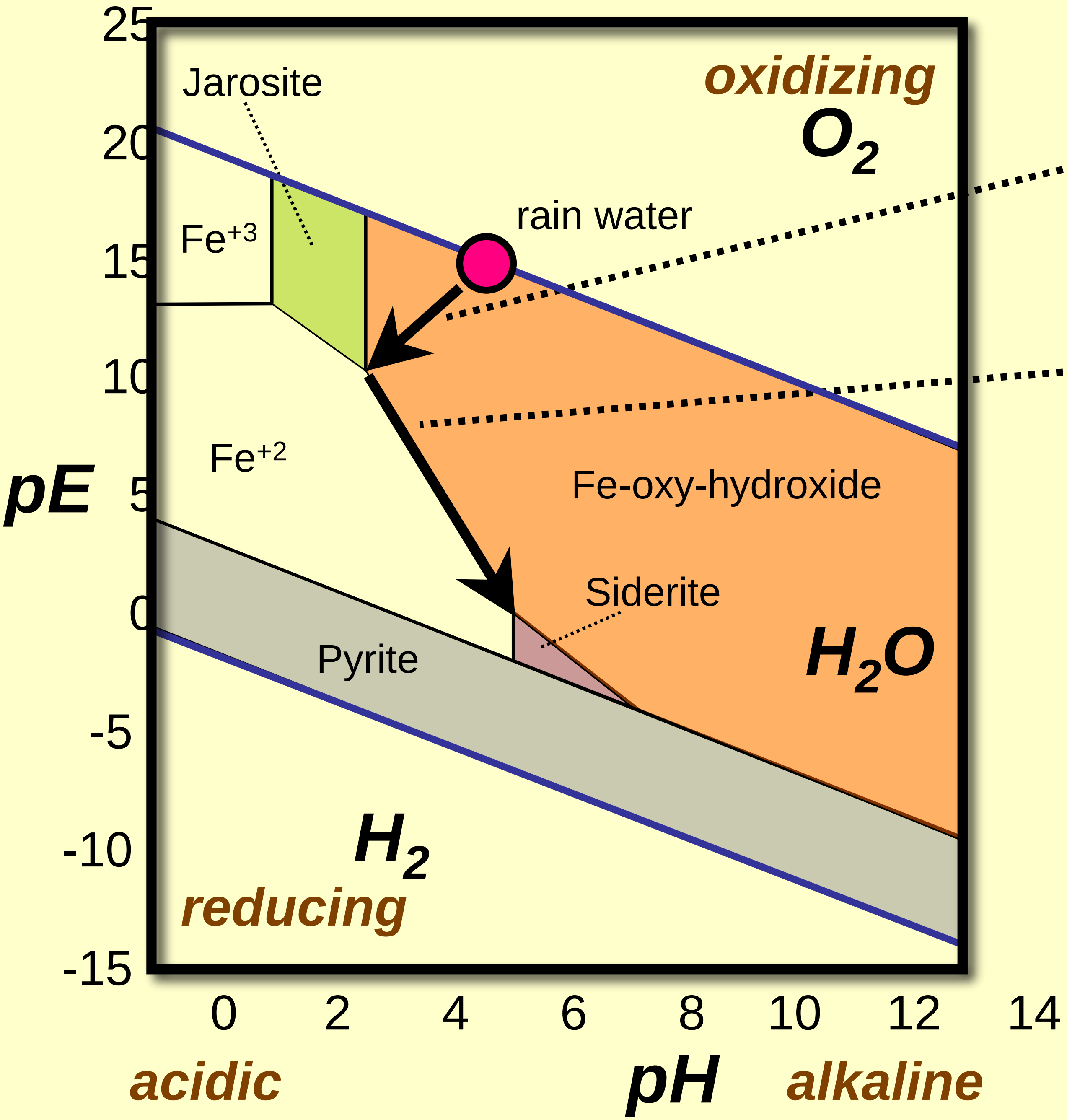


Jarosite
oxidizing
O2
Initial Pyrite
Oxidation
rain water
Fe+3
Buffering by
Chlorite
Hydrolysis
Fe+2
pE
Fe-oxy-hydroxide
Buffered
Hematite
Precipitation
Siderite
Pyrite
H2O
H2
reducing
25
20
15
10
5
0
-5
-10
-15
0
2
4
6
8
10
12
14
acidic
pH
alkaline



Jarosite
oxidizing
O_2
Initial Pyrite Oxidation
rain water
Fe+3
Buffering by Chlorite Hydrolysis
Fe+2
Fe-oxy-hydroxide
Buffered Hematite Precipitation
Siderite
Pyrite
H_2O
H_2
reducing
pE
25
20
15
10
5
0
-5
-10
-15
0
2
4
6
8
10
12
14
acidic
pH
alkaline

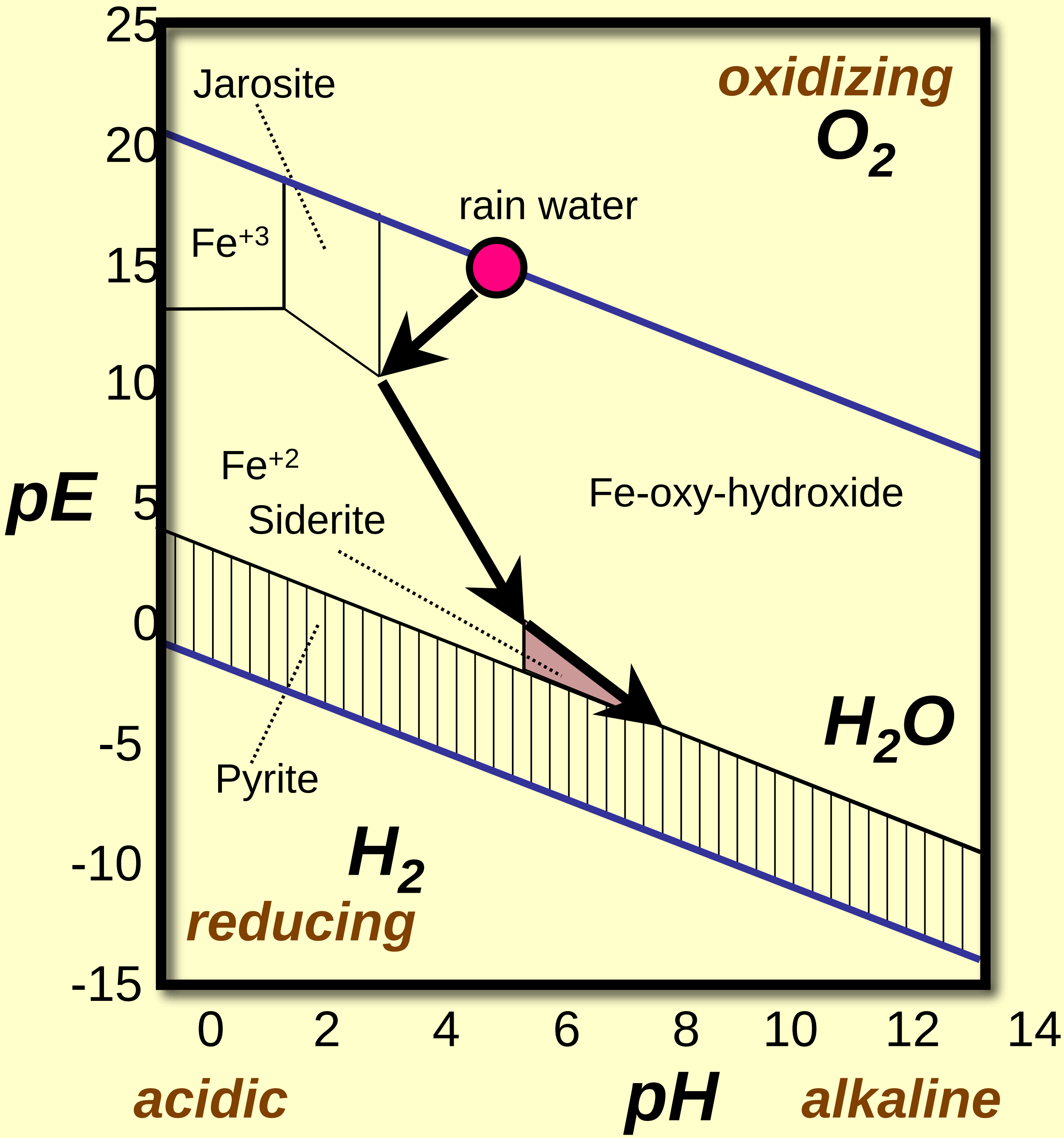

25
20
15
10
5
0
-5
-10
-15
pE
Jarosite
oxidizing
O2
Fe+3
rain water
Fe+2
Fe-oxy-hydroxide
Siderite
Pyrite
H2O
H2
reducing
0
2
4
6
8
10
12
14
acidic
pH
alkaline
Initial Pyrite Oxidation
Combined Buffering by Chlorite Hydrolysis & Specularite Precipitation



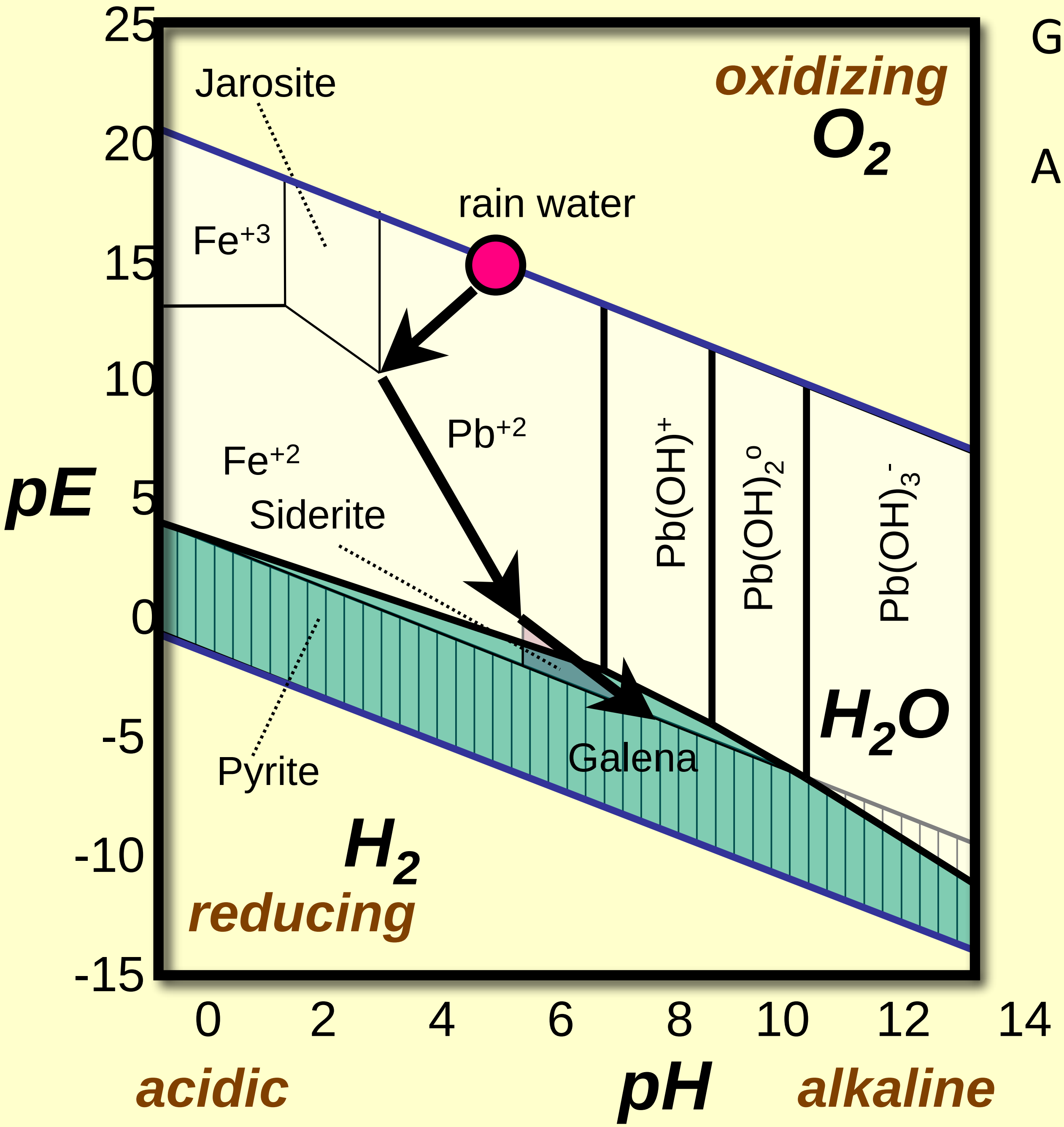
Initial Pyrite Oxidation

Combined Buffering by Chlorite Hydrolysis & Specularite Precipitation

Siderite - $FeCO_3$



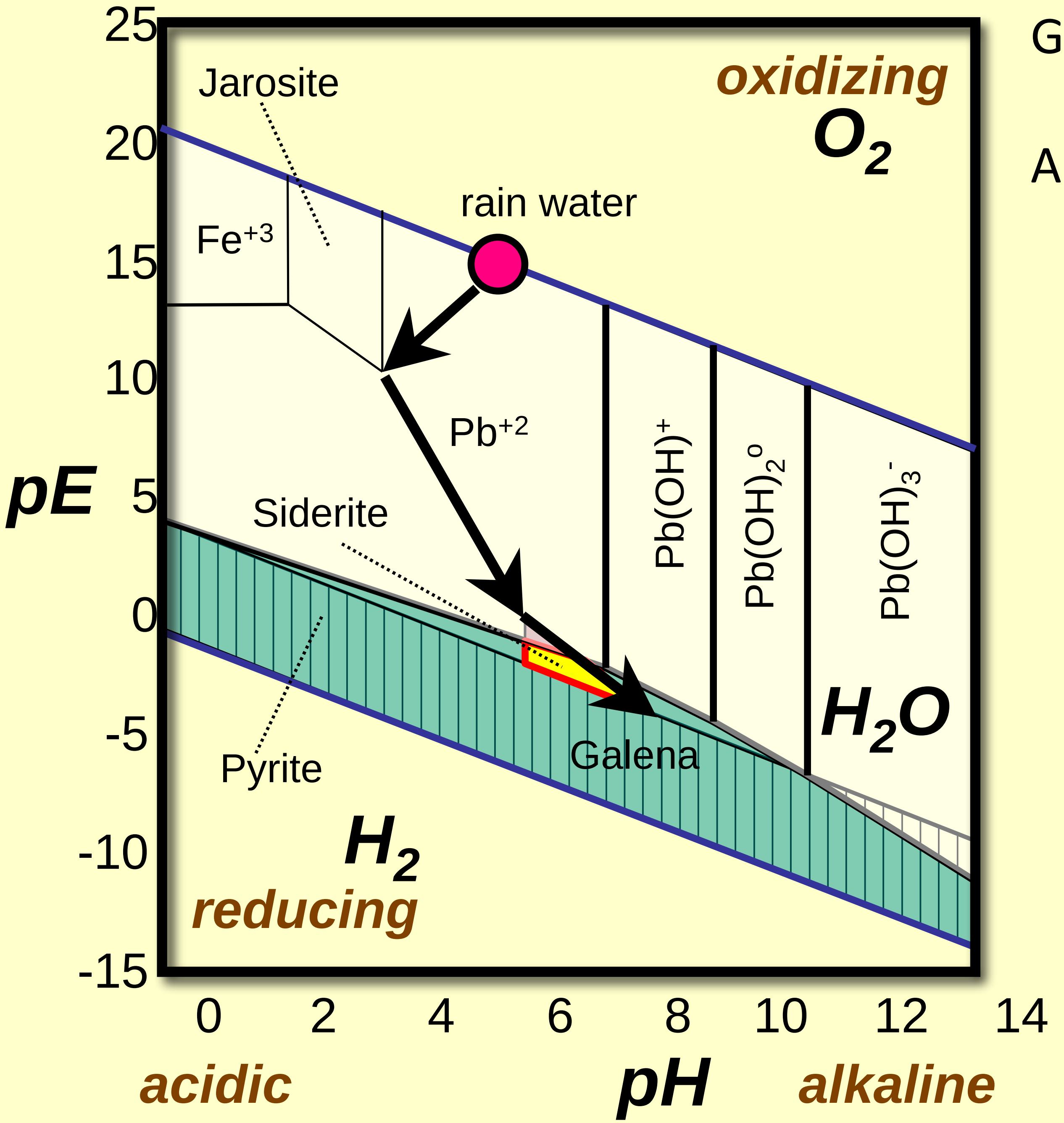
Siderite - $FeCO_3$



Gossan minerals:
goethite & siderite
Anomalous Pb enrichment (*f.g. galena*) above the supergene Cu zone

Galena - PbS

Siderite - $FeCO_3$

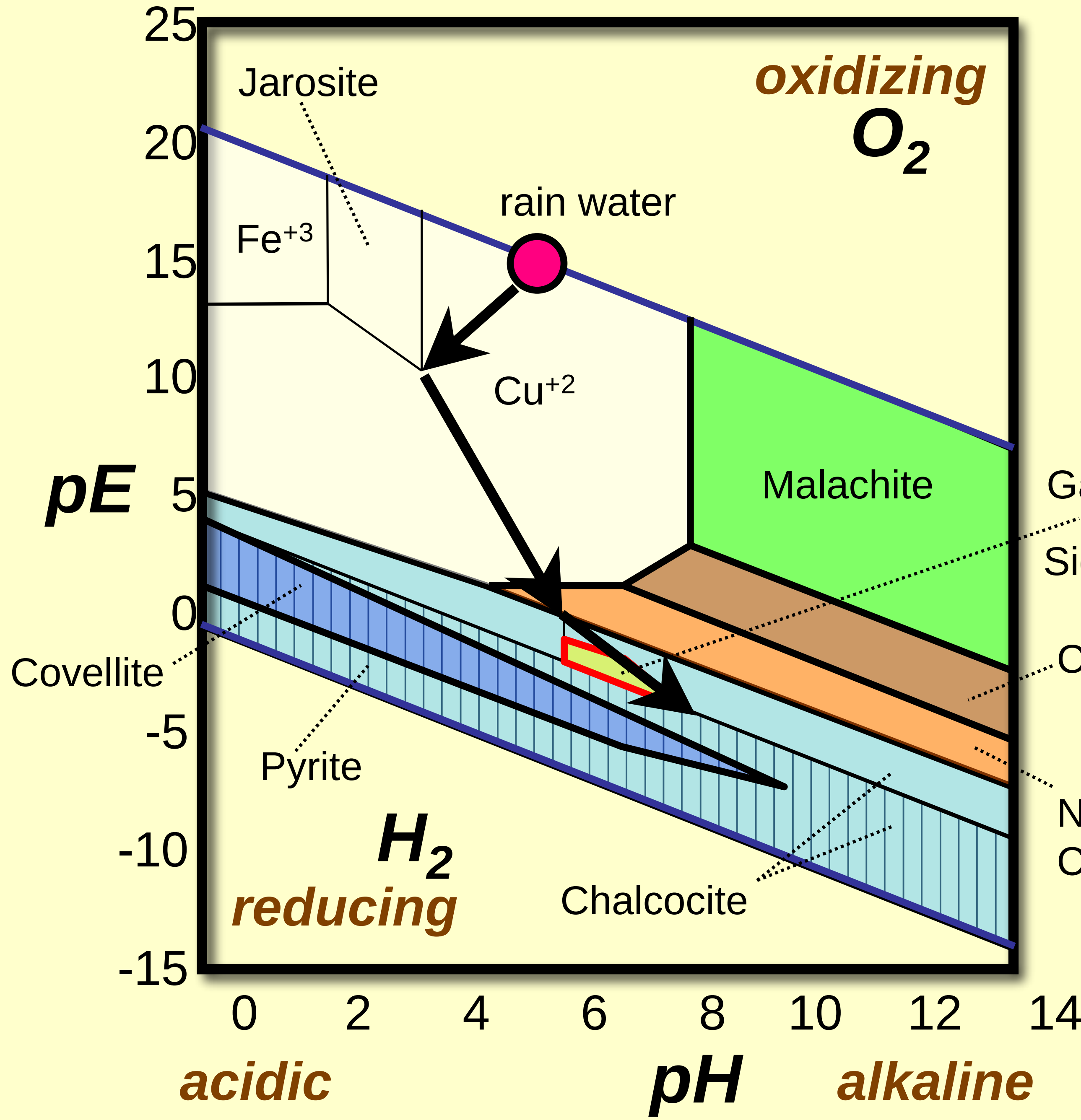


Gossan minerals:
goethite & siderite
Anomalous Pb enrich-
ment (*f.g. galena*)
above the super-
gene Cu zone

Galena - PbS

Siderite - $FeCO_3$

Supergene chalcocite
& covellite
Cu enrichment in a
supergene zone



Chalcocite - Cu_2S

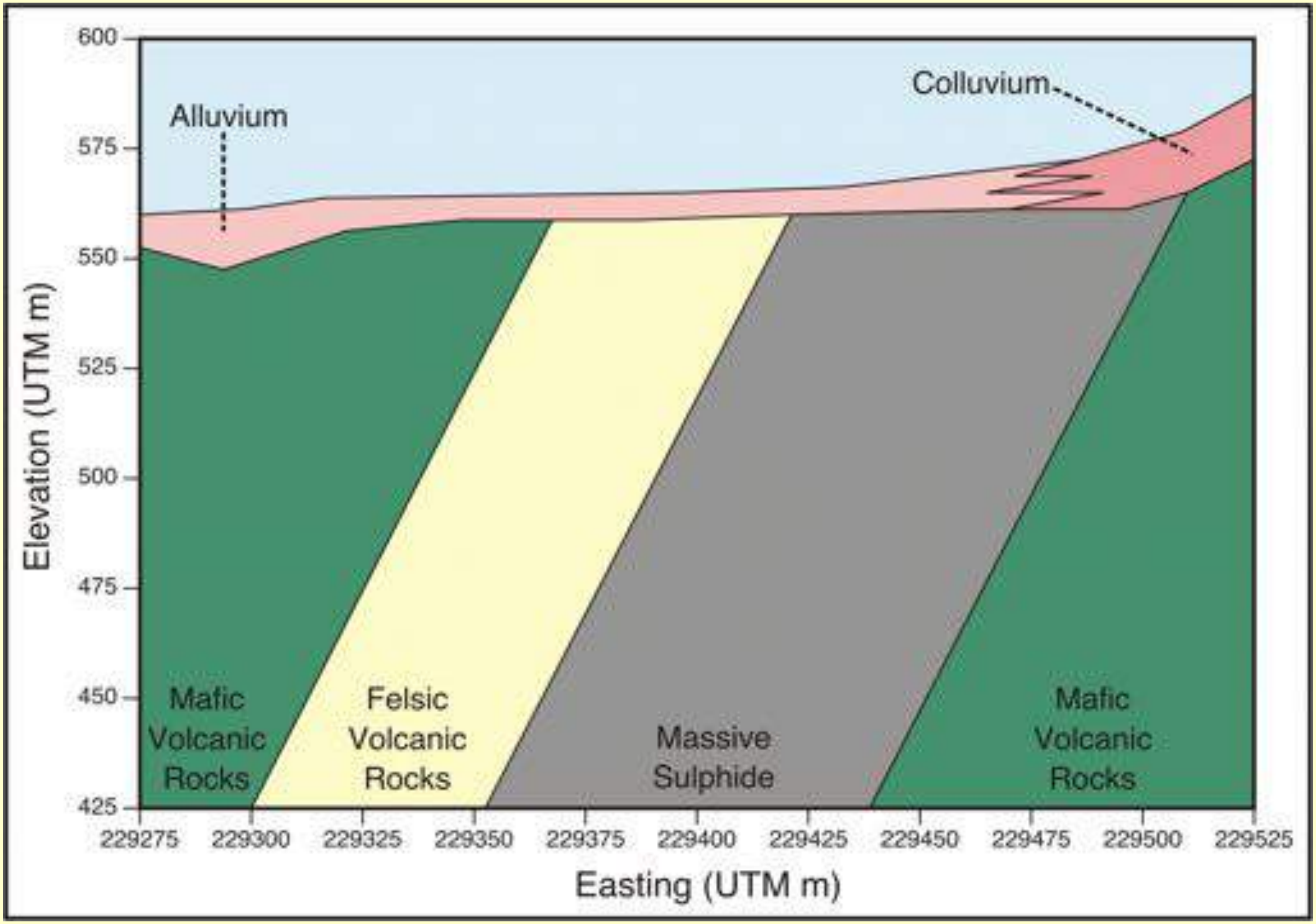
Covellite - CuS

Single Thermodynamic Model

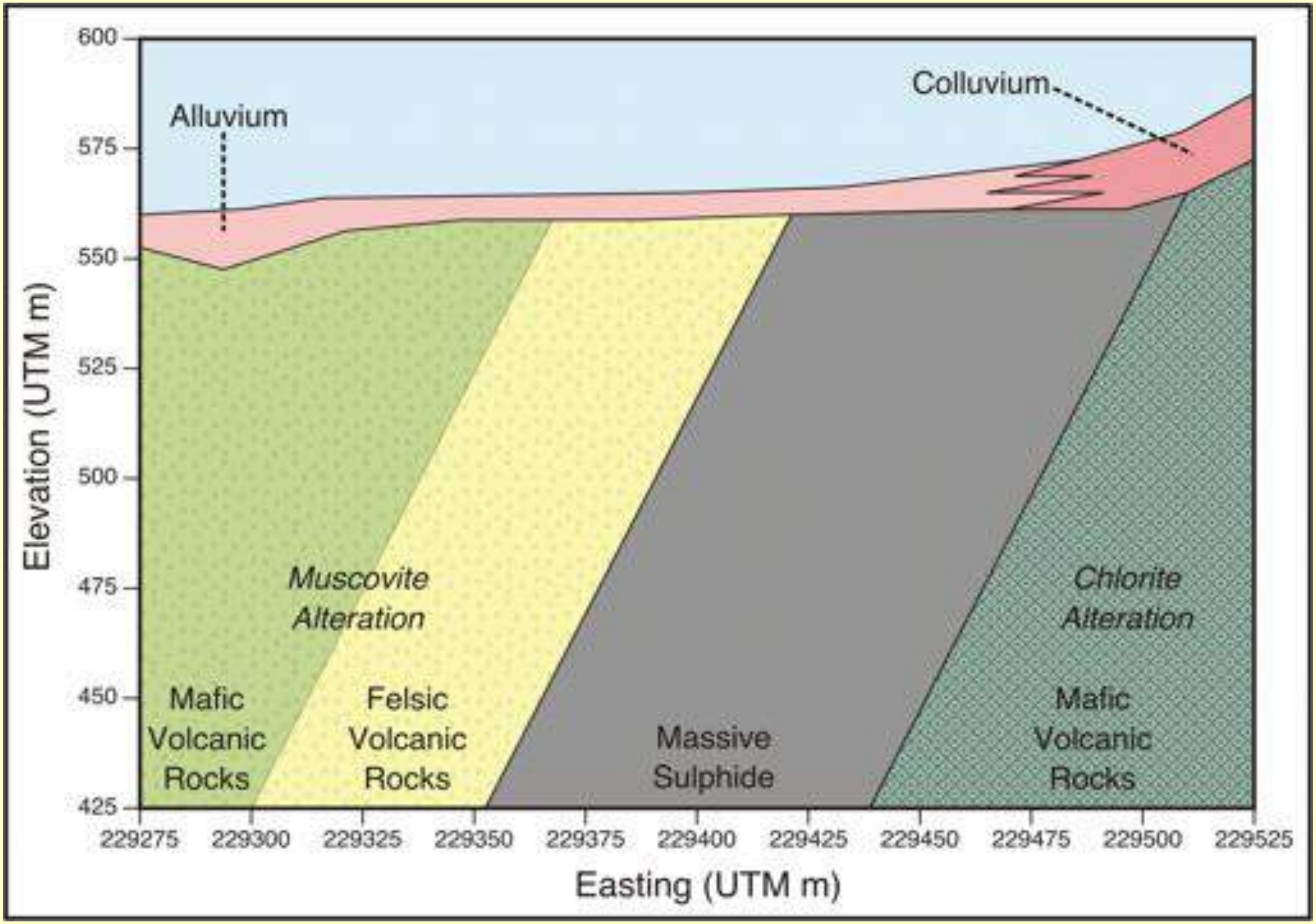
Vertical Zonation:

Goethite (*siliceous boxworks, above*) **Hematite (*massive, below*)**	***Oxide Gossan***
Galena + Siderite (+ *Hematite*) **Chalcocite + Covellite (+ *Hematite*)**	***Supergene Zone***
Chalcopyrite + Sphalerite (+ *Pyrite*)	***Massive Sulphide***

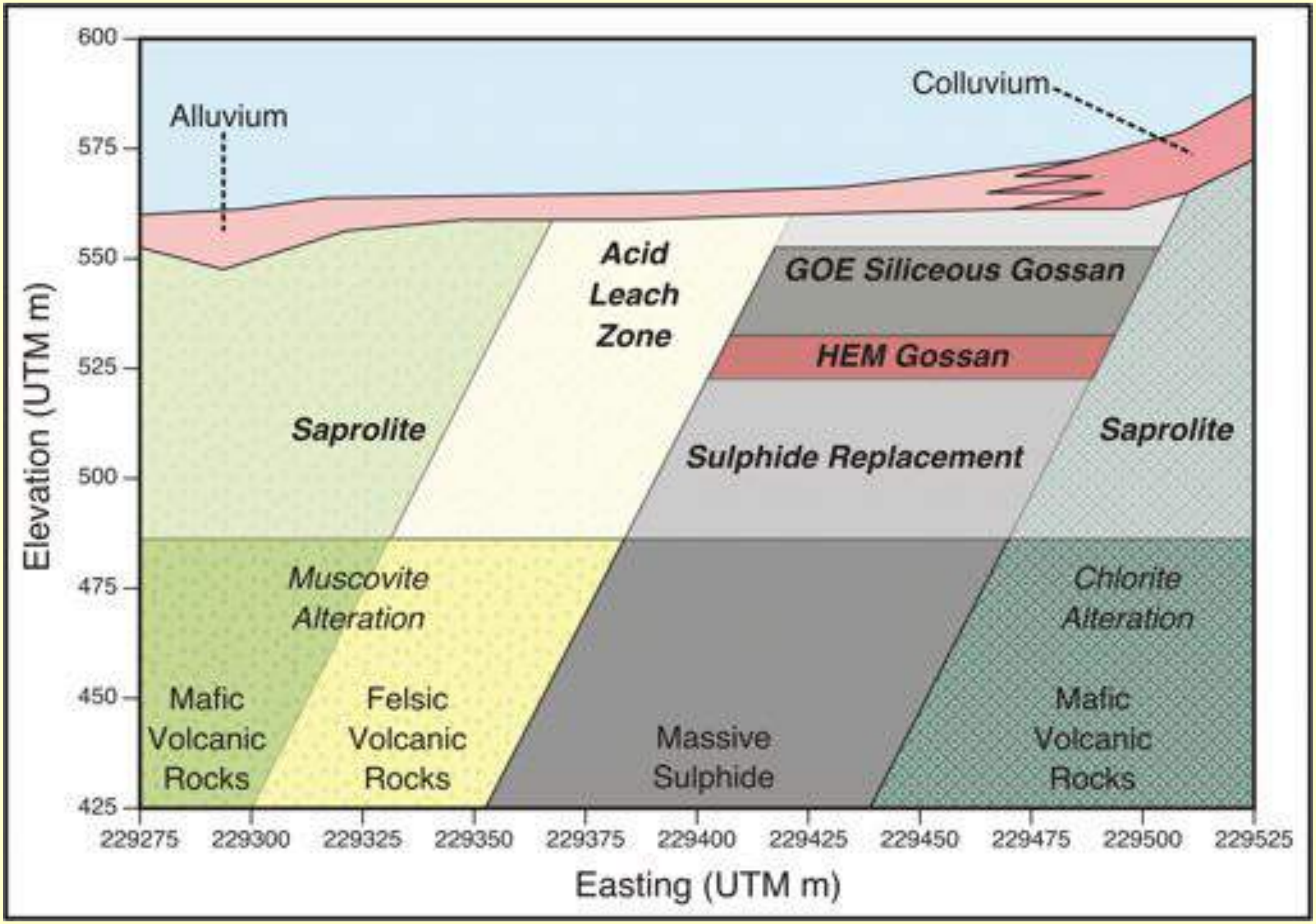
Schematic Section - Geology



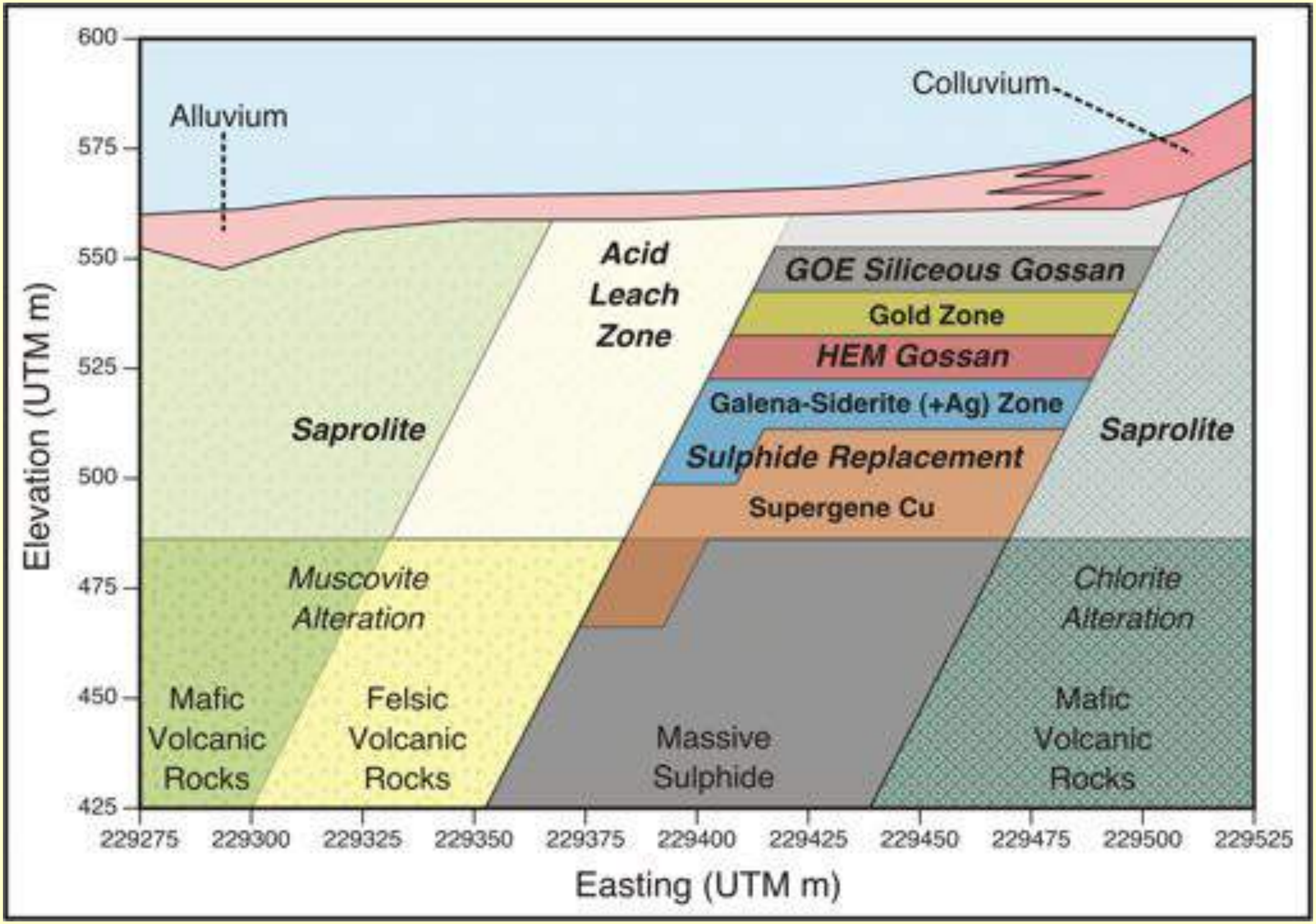
Schematic Section - Alteration



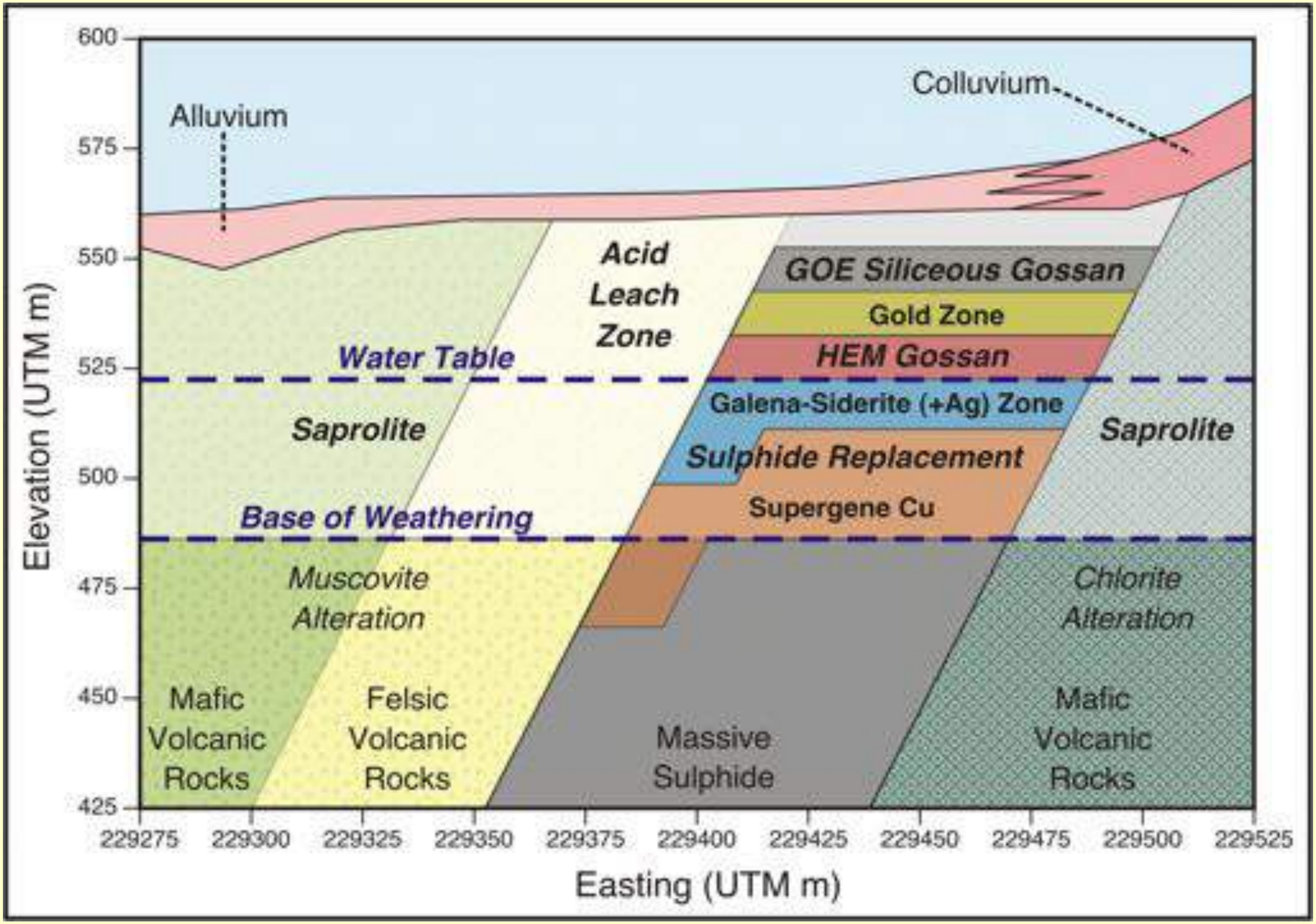
Schematic Section - Weathering



Schematic Section - Mineralization



Schematic Section - Interpretation



Take Away Points

The presence of jarosite, kaolinite, and acid leached host rocks suggests that during weathering, very low pH's (1 - 2) were obtained

This triggered:

- *concentration of Au by material transport down to the water table*
- *residual enrichment of Au due to S & Fe loss during oxidation*
- *transport & re-distribution of Fe in the gossan (leaching at surface, precipitation below as massive specularite)*
- *formation of residual siliceous gossan at the top of profile and Fe-oxy-hydroxide gossan below*

Anomalous Pb enrichment (*f.g. galena + siderite*) occurs at the top of the supergene Cu zone (predicted thermodynamically)

Such Pb enrichment is only observed in one other VHMS gossan worldwide (Las Cruces, Spain)

Jarositic acid leach zone is down 'hydraulic head' of the gossan due to lateral groundwater flow; restricted to muscovite altered felsic volcanic rocks (due to the presence of K & low buffering capacity)

Questions ?

NEVSUN
RESOURCES LTD.

BISHA
MINING

Asmara Geo-Congress - Sept./Oct. 2014

[redacted]

Bisha Mining Share Company

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Forward Looking Statements

This Presentation contains forward-looking statements within the meaning of the United States Private Securities Litigation Reform Act of 1995 and applicable Canadian securities legislation concerning anticipated developments on the Company's continuing and future operations in Eritrea, the adequacy of the Company's financial resources and financial projections. Forward-looking statements include, but are not limited to, statements concerning or the assumptions related to estimates of capital and operating costs, the timing, nature and extent of future copper, zinc and gold production, expanding exploration licenses, the estimation of mineral reserves and resources, methodologies and models used to prepare resource and reserve estimates, the realization of mineral reserve estimates, the conversion of mineral properties to reserves and resources, the potential to expand resources, reserves and mine life, future exploration budgets, plans, targets and work programs, capital expenditures and objectives, anticipated timing of grant of permits, mining and development plans and activities, construction and production targets and timetables, grades, processing rates, life of mine, net cash flows, metal prices, exchange rates, reclamation costs, results of drill programs, dividend plans and policy, litigation matters, integration or expansion of operations, requirements for additional capital, government regulation of mining operations, environmental risks, political risks and uncertainties, unanticipated reclamation expenses, and other events or conditions that may occur in the future. Forward-looking statements are frequently, but not always, identified by words such as "expects," "anticipates," "believes,“ "intends," "estimated," "potential," "possible", "budget" and similar expressions, or statements that events, conditions or results "will," "may,“ "could" or "should" occur or be achieved. Information concerning the interpretation of drill results and mineral resource and mineral reserve estimates also may be deemed to be forward-looking statements, as such information constitutes a prediction of what mineralization might be found to be present if and when a project is actually developed, and in the case of mineral reserves, such statements reflect the conclusion based on certain assumptions that the mineral deposit can be economically exploited.

Forward-looking statements are statements about the future and are inherently uncertain, and actual achievements of the Company or other future events or conditions may differ materially from those reflected in the forward-looking statements due to a variety of risks, uncertainties and other factors. Although the Company has attempted to identify important factors that could cause actual results to differ materially from those contained in forward-looking statements, there may be other factors that cause results not to be as anticipated, estimated or intended. The Company's forward-looking statements are based on the beliefs, expectations and opinions of management on the date the statements are made and the Company assumes no obligation to update such forward-looking statements in the future, except as required by law. There can be no assurance that such statements will prove to be accurate, as actual results and future events could differ materially from those anticipated in such statements. For the reasons set forth above, investors should not place undue reliance on forward-looking statements.

Please see the Company's Annual Information Form and Management Discussion and Analysis of BMSC for a more complete discussion of the risk factors associated with our business which have been filed with Canadian securities regulators and are available at www.sedar.com, which have also been filed or submitted to the U.S. Securities and Exchange Commission on Form 40-F or Form 6-K and are available at www.sec.gov .

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Geotechnical Hazard Management

The Big Picture - GCMP

Minimising the effect that a geotechnical hazard has on personnel safety, mine production and equipment damage

- Big picture:
  Ground Control Management Plan

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On the Ground

- **Remove the hazard**
  - Re-design
  - Controlled failure
  - Remediation
- **Limit the effect of the hazard**
  - Engineering controls
  - Physical barriers
    - Catch bench/bund
    - Wire mesh, catch fence
- **Limit the exposure of personnel/equipment to the hazard**
  - Exclusion zones/signage
  - Procedural controls
  - Education and awareness

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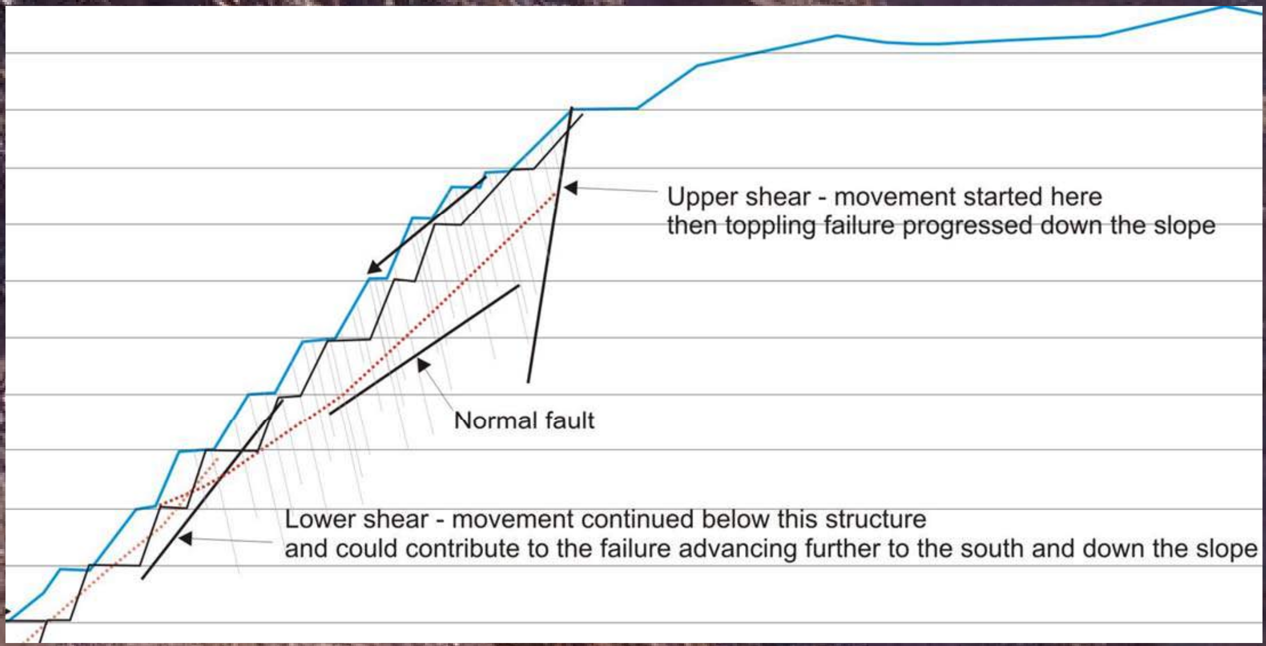
Redesign - Northeast Failure

Large toppling failure of the Northeast wall in January 2011

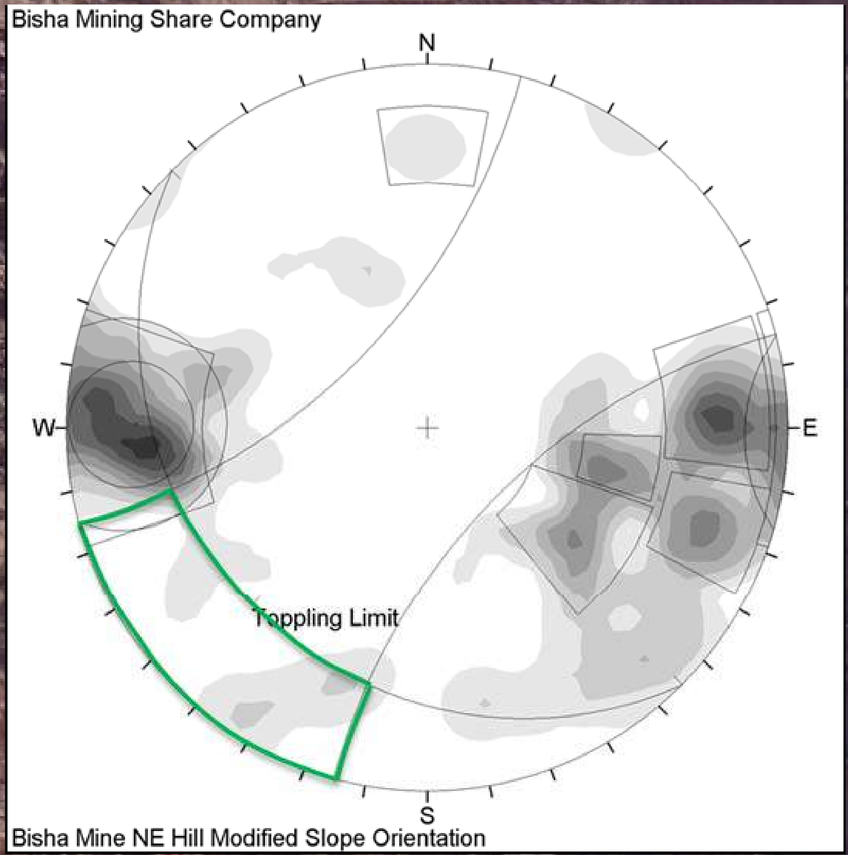
- Toppling risk had been identified
- Release shear had not



Redesign - Northeast Failure

- Drilling programme conducted
- Failure mode identified

- Slope orientation altered to negate similar failure occurring in the future



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Remediate - North Wall Failure

Batter scale sliding failure

Triggered by blast in immediate area

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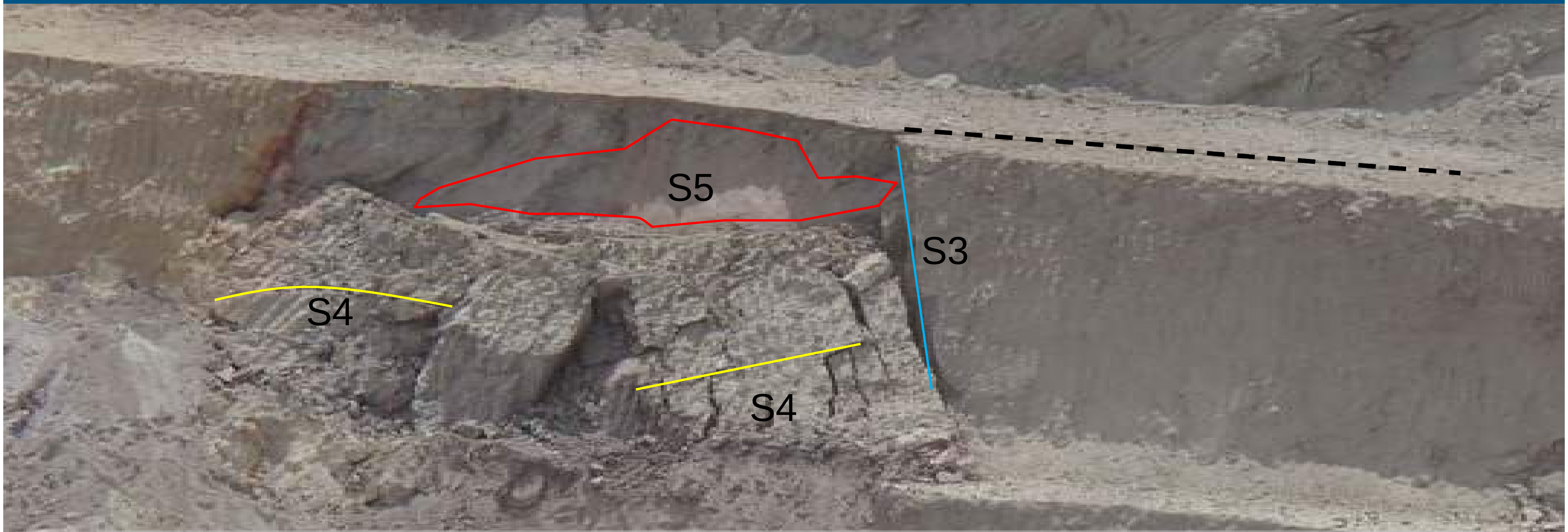
Remediate - North Wall Failure

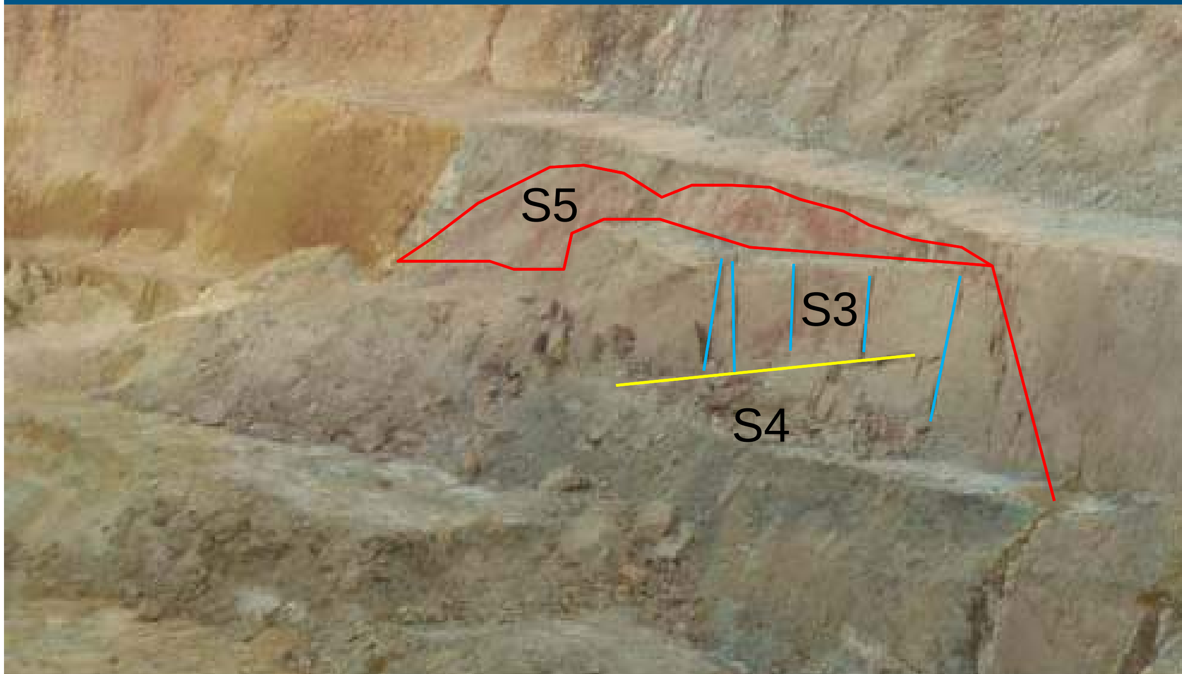


Area observed and failure mass excavated

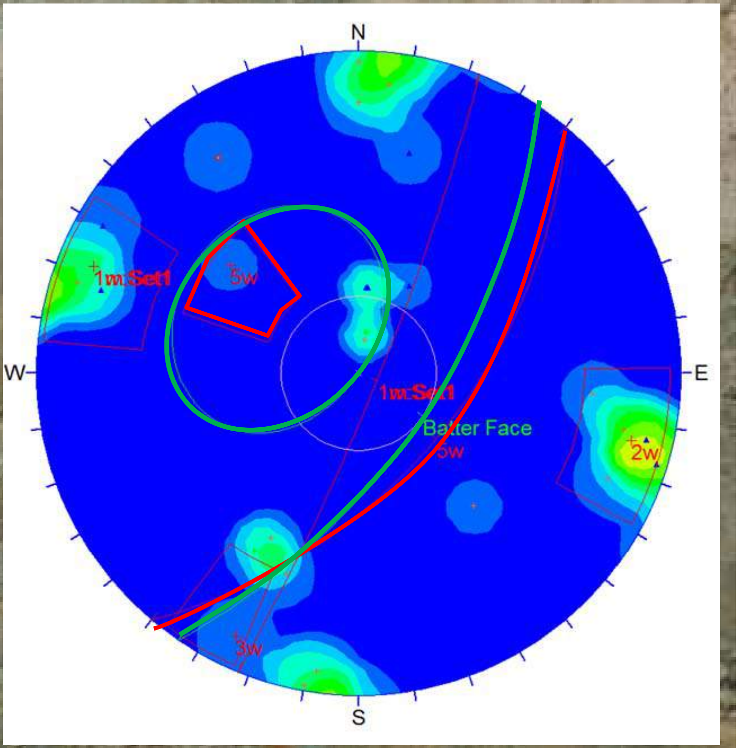
- Full Team Based Risk Assessment completed
- Excavated in a controlled manner

Area isolated for the wet season .

Remediate - North Wall Failure



- S5 Joint had had been recorded during mapping
- Low risk assumed



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Remediate - North Wall Failure

- Controlled clean-up undertaken

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Remediate - North Wall Failure

- Controlled clean-up undertaken
- Area inspected and declared safe
- Geotechnical restrictions lifted and mining continued as normal

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Remediate - North Wall Failure

Until

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North Wall Failure - Remediate

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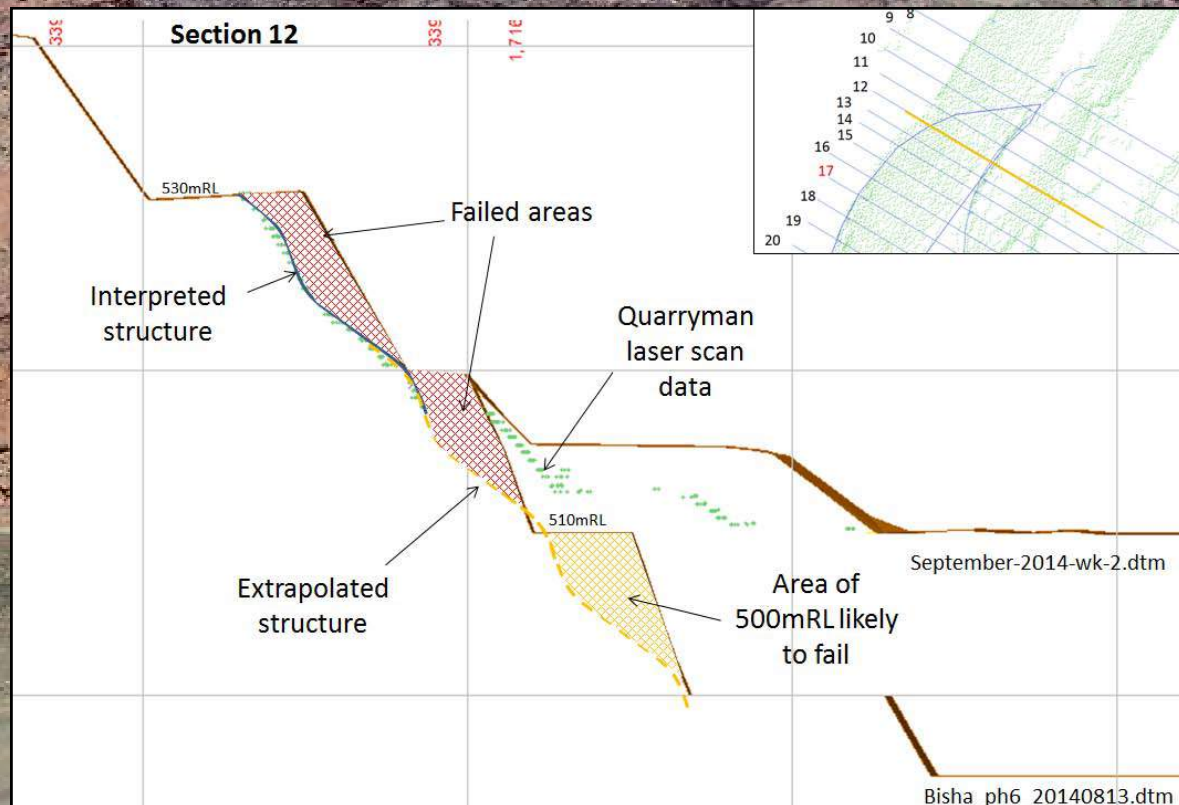
~~Remediate~~ - North Wall Failure

Re-design!

- Laser scan
- Interpret structure
- Redesign next bench



24/09/2014

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Engineering controls

A hazard exists, but it is not possible, feasible, or too costly to remove the hazard

Limit the effect of the hazard

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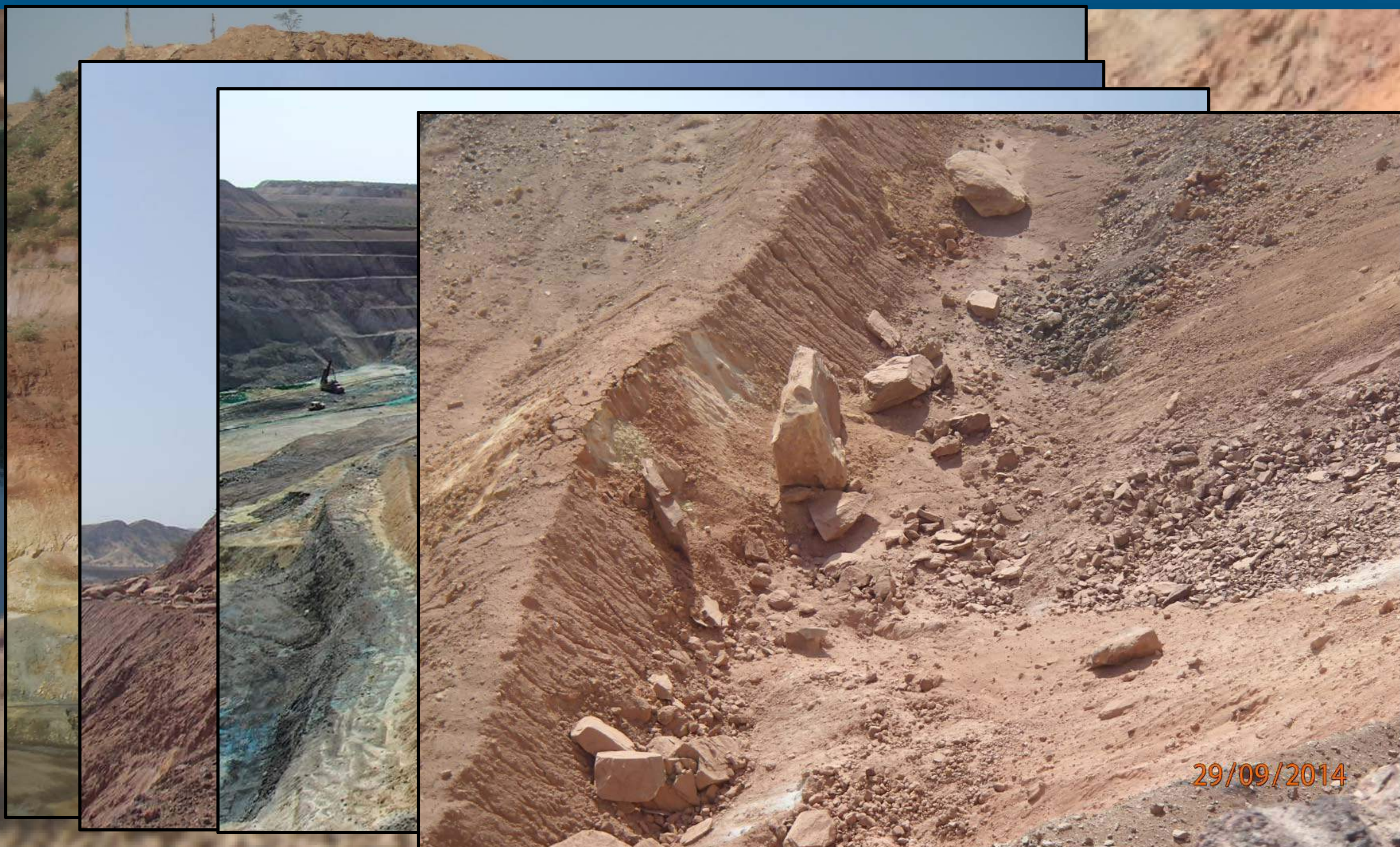
Engineering controls



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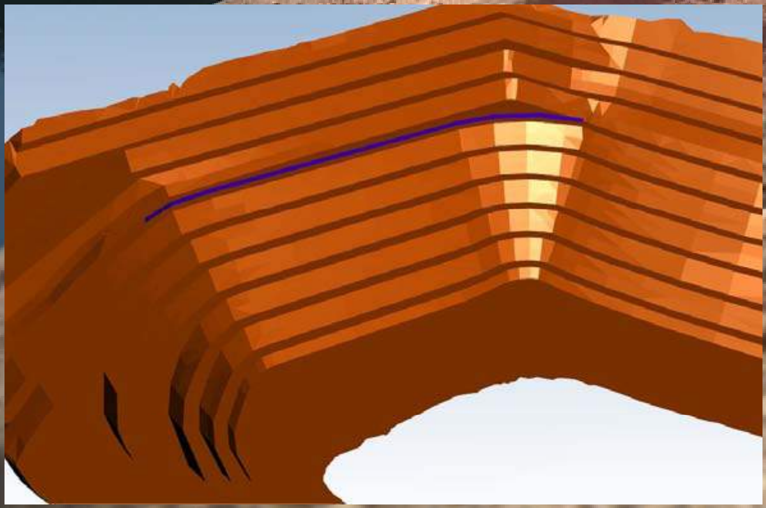
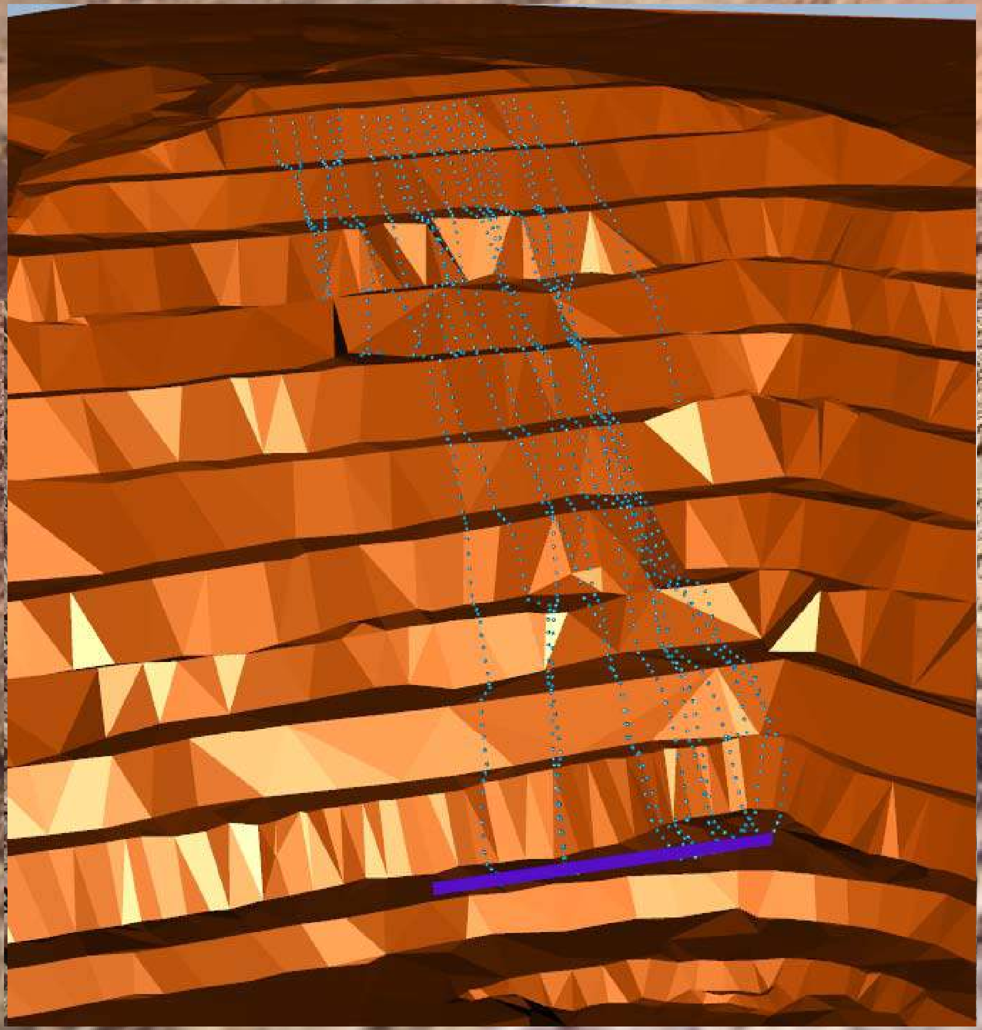
Engineering controls

- Rockfall Catch fence
- High risk of rockfall on NELB cutback





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Procedural controls

Policies or procedures put in place to mitigate risk

Remove or limit access to the hazard area

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Procedural controls

Policies or procedures put in place to mitigate risk

- Signage
- Exclusion zones
- Risk assessments
- Education and awareness
  - Geotechnical Hazard Maps

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Geotechnical Exclusion zones

Put in place for <u>YOUR SAFETY</u>

NO ENTRY

without:

√ completed TBRA

<u>and</u>

√ approval from the Geotechnical Department.

Work must be conducted following the methods outlined in the TBRA

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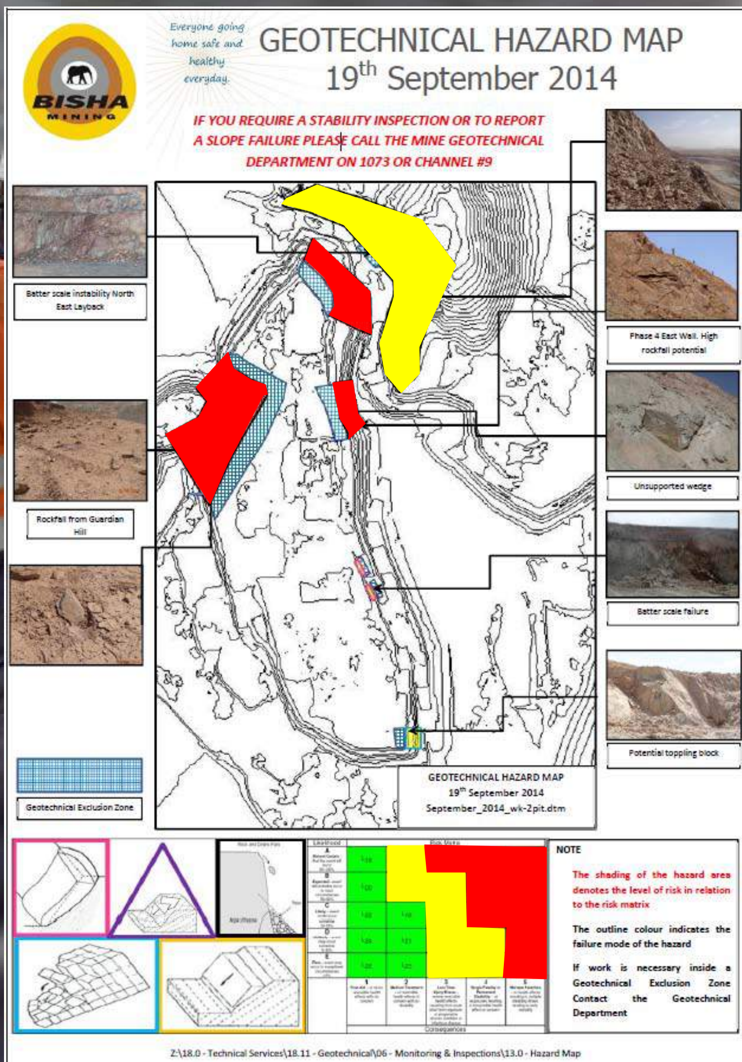
Geotechnical Hazard Map



Intended as a visual indication to pit personnel identifying areas of geotechnical hazard

Identifies:

- The hazard area
  - The shading of the hazard area indicates the level of risk in relation to the risk matrix

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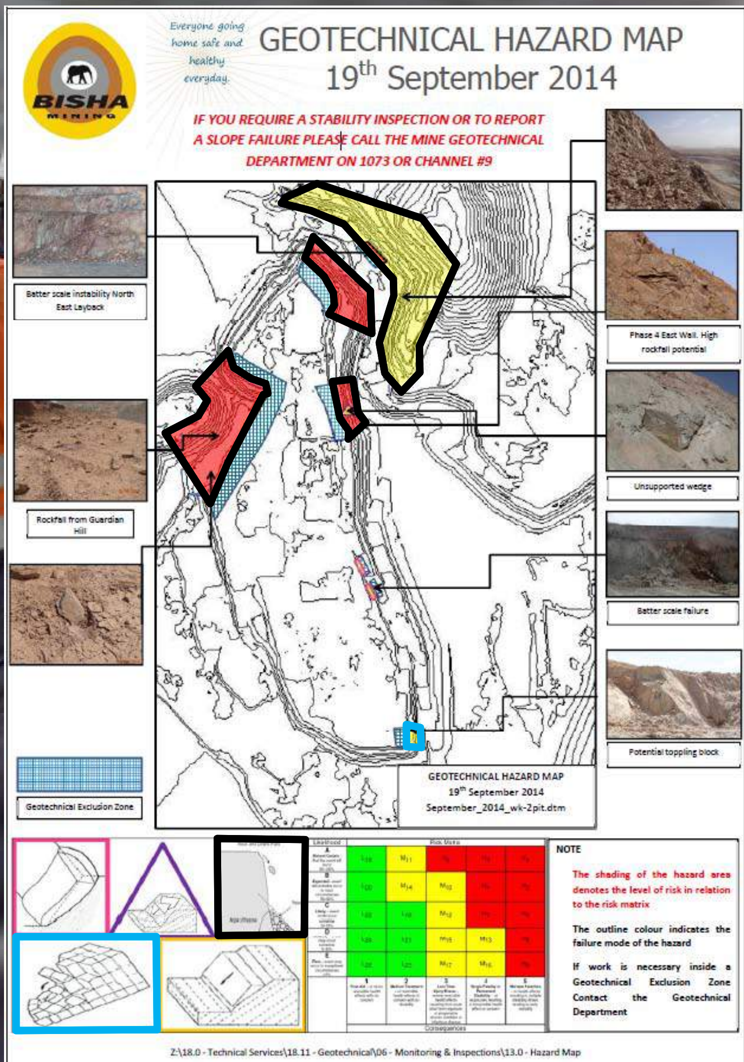
Geotechnical Hazard Map



Intended as a visual indication to pit personnel identifying areas of geotechnical hazard

Identifies:

- The hazard area
  - The shading of the hazard area indicates the level of risk in relation to the risk matrix
- The failure mode of the hazard
  - The outline color
  - Sliding, Wedge, Rockfall, Toppling, Planar

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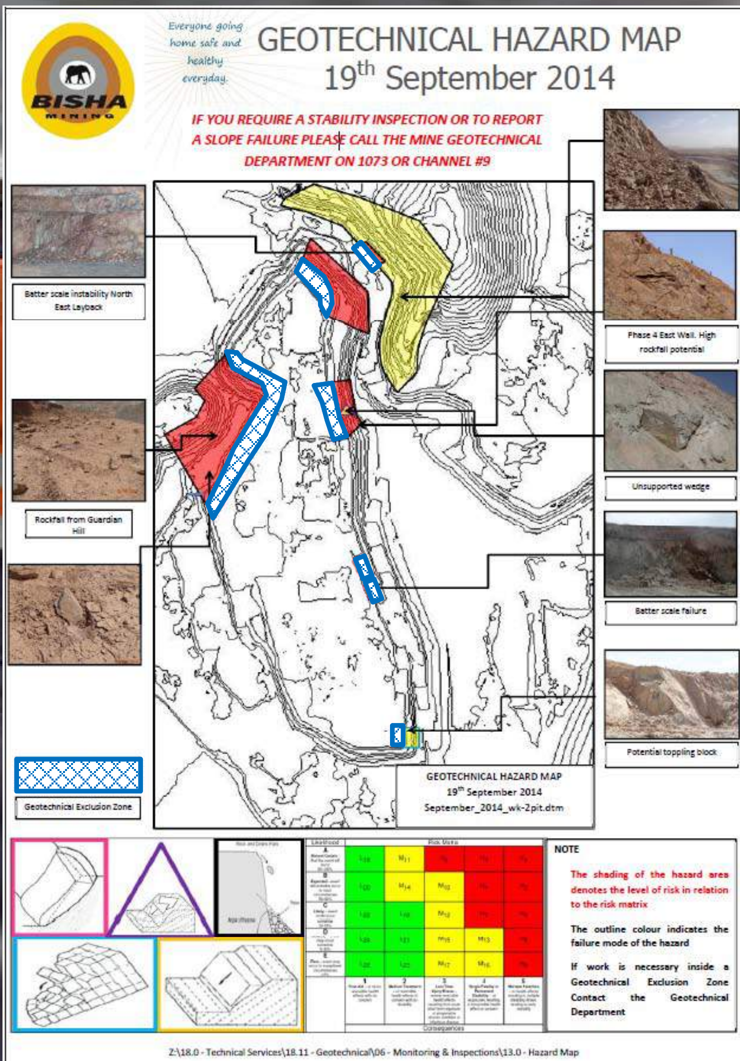
Geotechnical Hazard Map



Intended as a visual indication to pit personnel identifying areas of geotechnical hazard

Identifies:

- The hazard area
  - The shading of the hazard area indicates the level of risk in relation to the risk matrix
- The failure mode of the hazard
  - The outline color
  - Sliding, Wedge, Rockfall, Toppling, Planar
- The location of Geotechnical Exclusion Zones

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Education and Awareness

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Geotechnical Hazard Management

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Forward Looking Statements

This Presentation contains forward-looking statements within the meaning of the United States Private Securities Litigation Reform Act of 1995 and applicable Canadian securities legislation concerning anticipated developments on the Company's continuing and future operations in Eritrea, the adequacy of the Company's financial resources and financial projections. Forward-looking statements include, but are not limited to, statements concerning or the assumptions related to estimates of capital and operating costs, the timing, nature and extent of future copper, zinc and gold production, expanding exploration licenses, the estimation of mineral reserves and resources, methodologies and models used to prepare resource and reserve estimates, the realization of mineral reserve estimates, the conversion of mineral properties to reserves and resources, the potential to expand resources, reserves and mine life, future exploration budgets, plans, targets and work programs, capital expenditures and objectives, anticipated timing of grant of permits, mining and development plans and activities, construction and production targets and timetables, grades, processing rates, life of mine, net cash flows, metal prices, exchange rates, reclamation costs, results of drill programs, dividend plans and policy, litigation matters, integration or expansion of operations, requirements for additional capital, government regulation of mining operations, environmental risks, political risks and uncertainties, unanticipated reclamation expenses, and other events or conditions that may occur in the future. Forward-looking statements are frequently, but not always, identified by words such as "expects," "anticipates," "believes,“ "intends," "estimated," "potential," "possible", "budget" and similar expressions, or statements that events, conditions or results "will," "may,“ "could" or "should" occur or be achieved. Information concerning the interpretation of drill results and mineral resource and mineral reserve estimates also may be deemed to be forward-looking statements, as such information constitutes a prediction of what mineralization might be found to be present if and when a project is actually developed, and in the case of mineral reserves, such statements reflect the conclusion based on certain assumptions that the mineral deposit can be economically exploited.

Forward-looking statements are statements about the future and are inherently uncertain, and actual achievements of the Company or other future events or conditions may differ materially from those reflected in the forward-looking statements due to a variety of risks, uncertainties and other factors. Although the Company has attempted to identify important factors that could cause actual results to differ materially from those contained in forward-looking statements, there may be other factors that cause results not to be as anticipated, estimated or intended. The Company's forward-looking statements are based on the beliefs, expectations and opinions of management on the date the statements are made and the Company assumes no obligation to update such forward-looking statements in the future, except as required by law. There can be no assurance that such statements will prove to be accurate, as actual results and future events could differ materially from those anticipated in such statements. For the reasons set forth above, investors should not place undue reliance on forward-looking statements.

Please see the Company's Annual Information Form and Management Discussion and Analysis of BMSC for a more complete discussion of the risk factors associated with our business which have been filed with Canadian securities regulators and are available at www.sedar.com, which have also been filed or submitted to the U.S. Securities and Exchange Commission on Form 40-F or Form 6-K and are available at www.sec.gov .

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Contents

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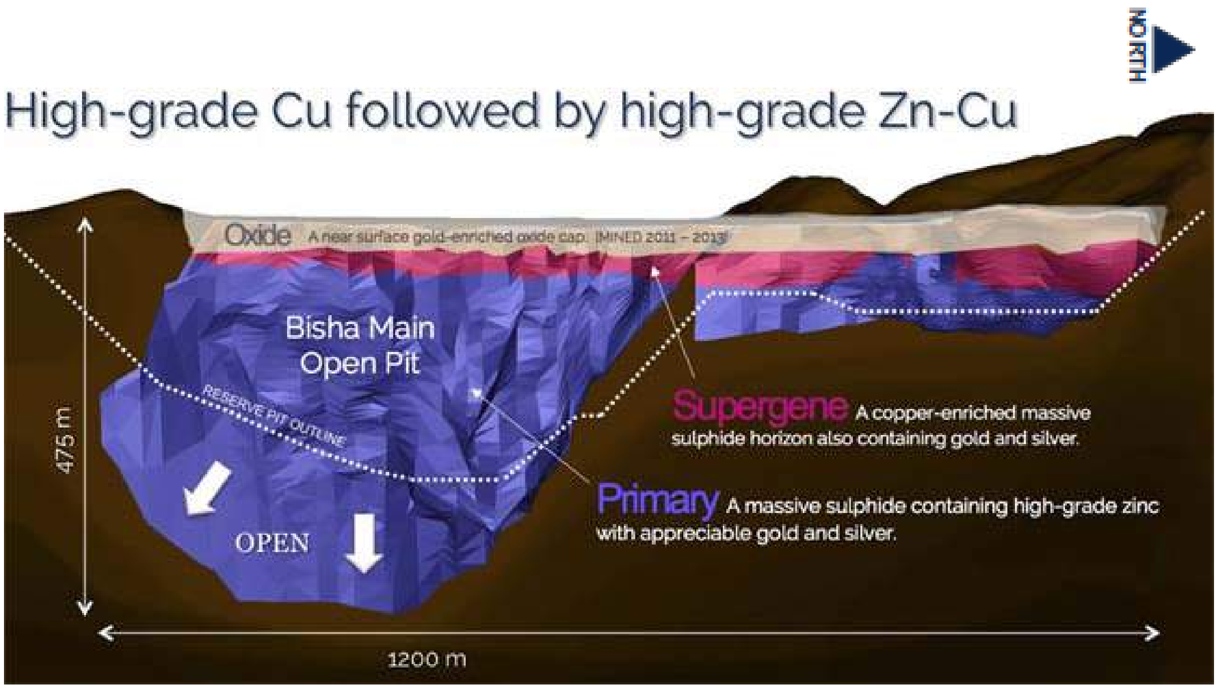
Introduction

- Located 150 km West of Asmara
- Large, high grade Volcanogenic Massive Sulphide (VMS)
- Rock types hosting the ore deposit include:
  Rhyolite, rhyolite breccia, mudstone and mafic volcanic rocks.
- The mineralized ore body extends to a depth of 475m and is open at depth.



Bisha Ore Reserves

(Effective December 31, 2013)

Zone	Tonnage	Copper	Zinc	Gold	Silver
Oxide	430 kt	-	-	6.5 g/t	20 g/t
Supergene	7,400 kt	3.57 %	-	0.61 g/t	27 g/t
Primary	18,390 kt	1.02 %	5.66 %	0.68 g/t	46 g/t

Based on US$2.90/lb Copper, US$0.92/lb Zinc, US$1175/oz Gold and US$20/oz Silver

http://nevsun.com/pdf/Nevsun_TechReport-Bisha_Mine_2014.pdf

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Introduction

Mine Geology

The grade control geology section is a part of the Technical Services department. We have a dedicated team of grade control personnel who are responsible for logging, sampling, mapping, creating dig-blocks and tracking ore to ensure that we understand the grade distribution of Au, Ag, *Cu, As* & *Zn* in order to deliver a quality product to the process plant.

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Sampling

1. Reverse Circulation (RC) Samples

- Two RC rigs (Schramm)
- Drilled over 2,600 holes and 40,000m to date
- 38,000 samples undertaken to date
- Samples/rock chips are collected every meter
- Analyzed on site lab (SGS)
- Assayed for Cu, Au, Ag, Zn, As and S

2. Grab Samples

I - Blending Grab Samples (GBR)

- Active feeding faces at ROM Pad every 2 hours
- Monitor the grades of the active stockpiles

II - Stockpile Samples (GBS)

- Sample taken from stockpiles
- Confirms the grade of the stockpile

Grade Control Rigs

Sampling

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Logging

Purpose

- To identify mineralized zones from waste.
- To determine the association between lithology, alteration and oxidation with mineralization.
- To correlate variations of stratigraphy with assay results
- To determine the thickness of each lithology.

<u>Types of Logging</u>

1. **RC Chips**
   Rock Chips (lithology, alteration and description)

2. **Blast Hole Chips**
   Cutting material

RC Chips

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Mapping

Purpose

- To determine lithology
- To identify geological structures
- To identify the ore-waste boundary
- To increase the accuracy of GCX Blocks

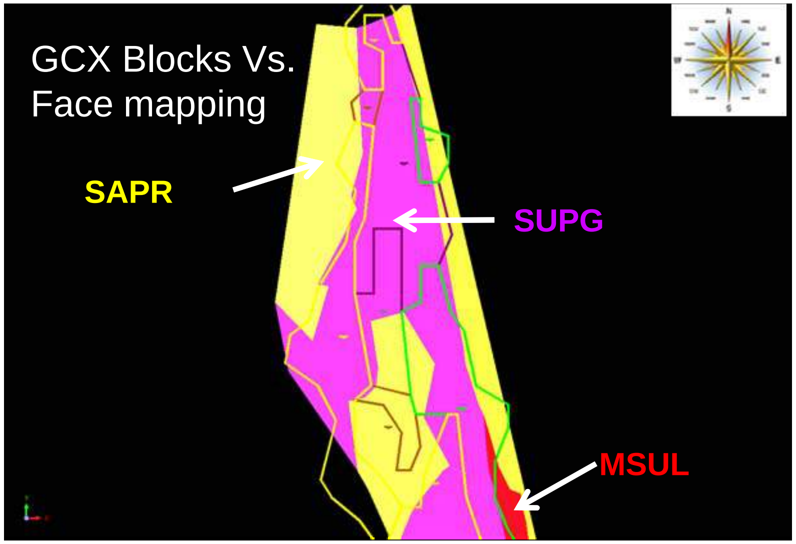
Types of Mapping

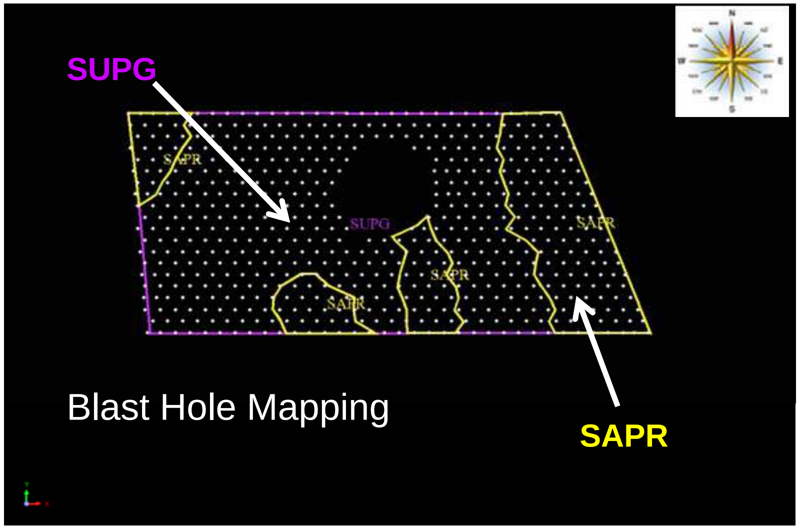
1. Face Mapping

Active digging face
Perpendicular to the Strike of the ore body
Using GPS and compass
SURPAC and Arc GIS

2. Blast Hole Mapping

Every blast pattern that includes ore
Using Blast hole map





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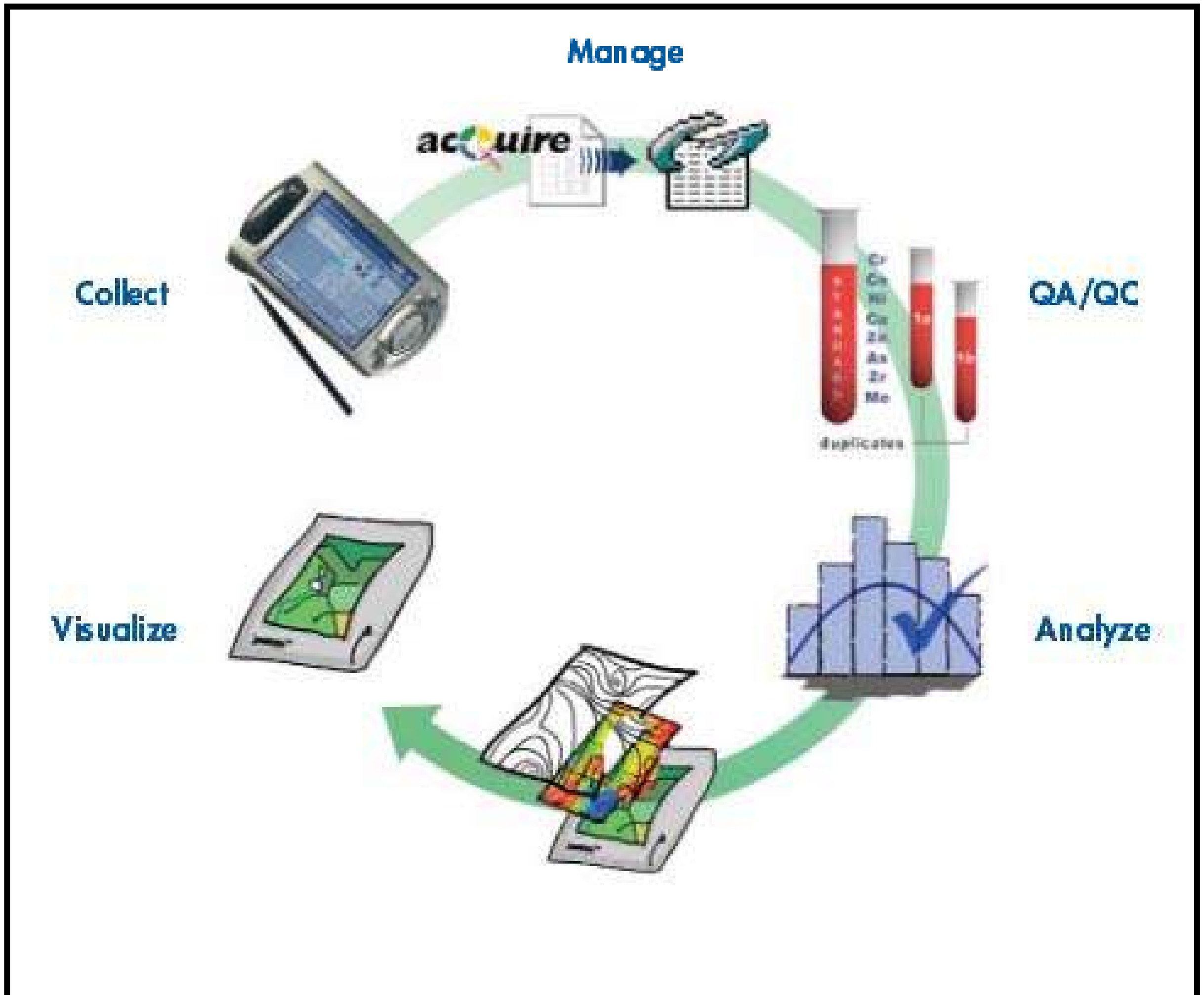
Creating Ore Blocks

Acquire

- Database
- Manage information



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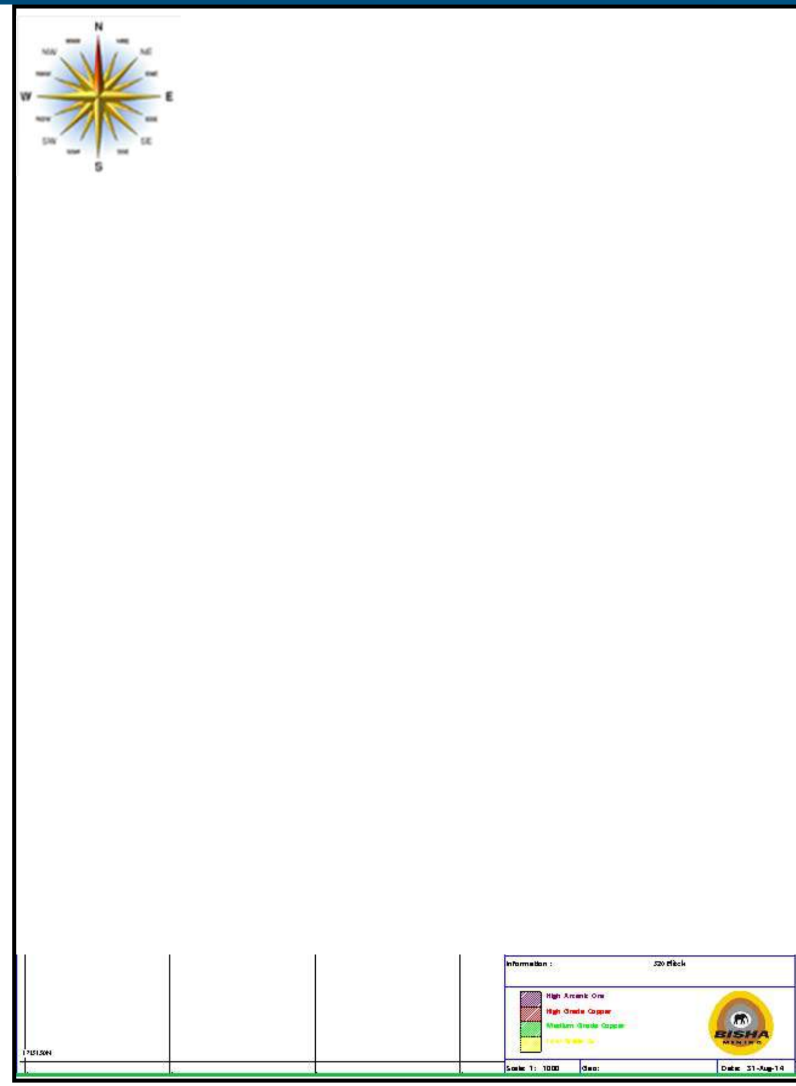
Creating Ore Blocks

GCX

- Integrated with Surpac^{TM} mining software.
- Designed by CUBE Consulting™
- Grade estimation and reporting system.
- Produces ore blocks for grade control

Bisha Material Types

>15% Cu	DSO (Direct Shipping Ore)
8-15% Cu	HG (High Grade Copper)
4 - 8% Cu	MG (Medium Grade Copper)
0.6 - 4% Cu	LG (Low Grade Copper)
0.3 - 0.6% Cu	SLG(Sub Low Grade Copper)
Cu:Zn ratio < 8:1	ZNO (Zinc Ore)



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Ore Mining and Tracking

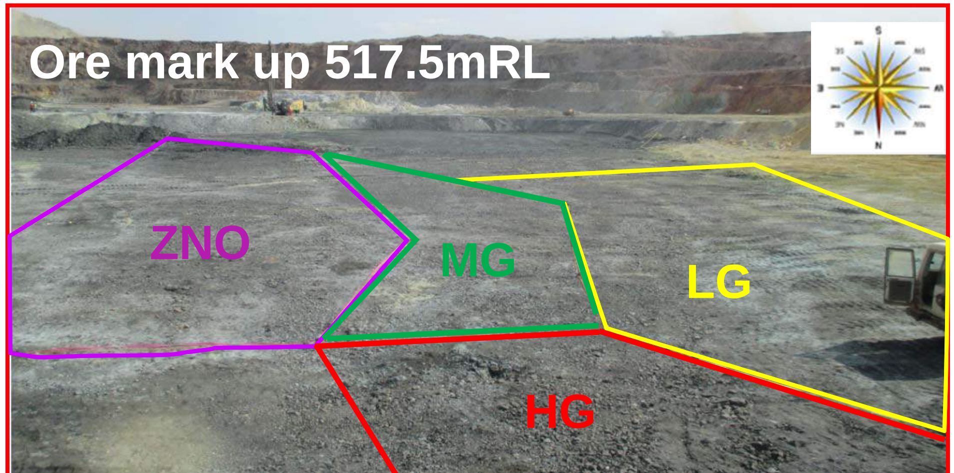
- Ore mining is selective.
- Material from the pit is transported to various stockpile destinations:
- ROM Pad and long term stockpiles

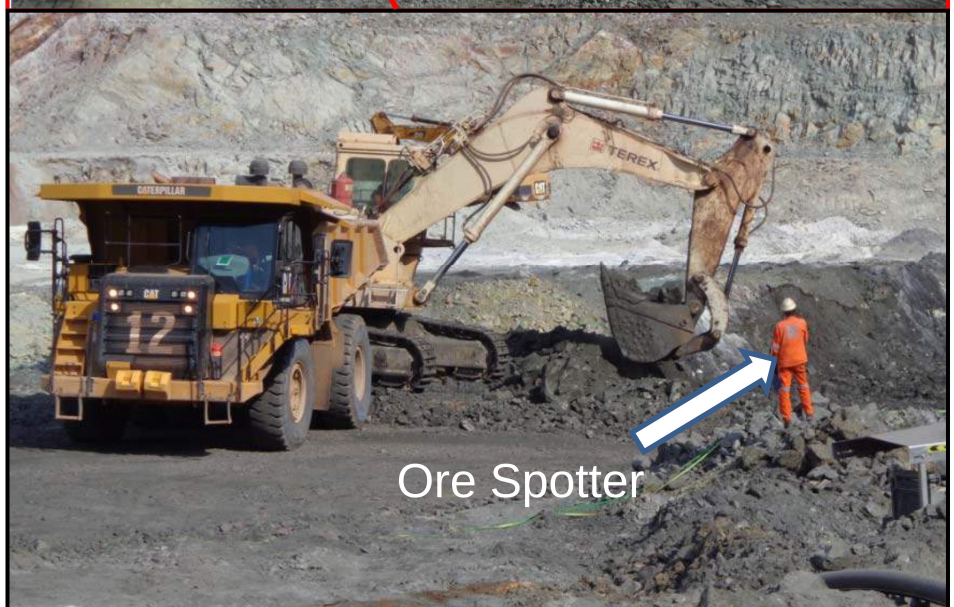
Ore Spotter

- Key person to manage the ore and waste
- Is responsible to minimize:
  - Waste to ROM ➡ Dilution
  - Ore to Waste ➡ Loss

(e.g. one dump truck HG Copper is worth US$45,000)

- Controls the ore block mining
- Keeps count of ore loads and monitors the mill feed blend ratio





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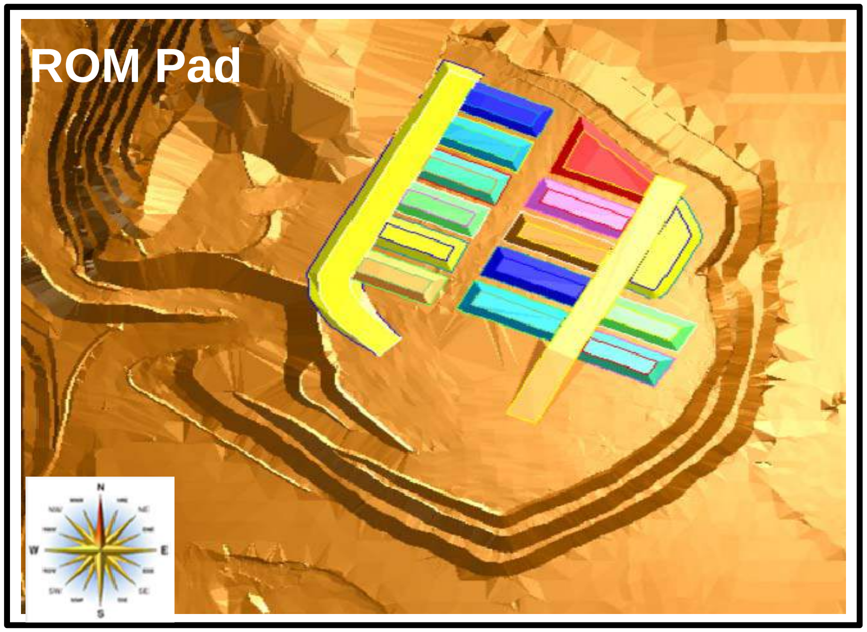
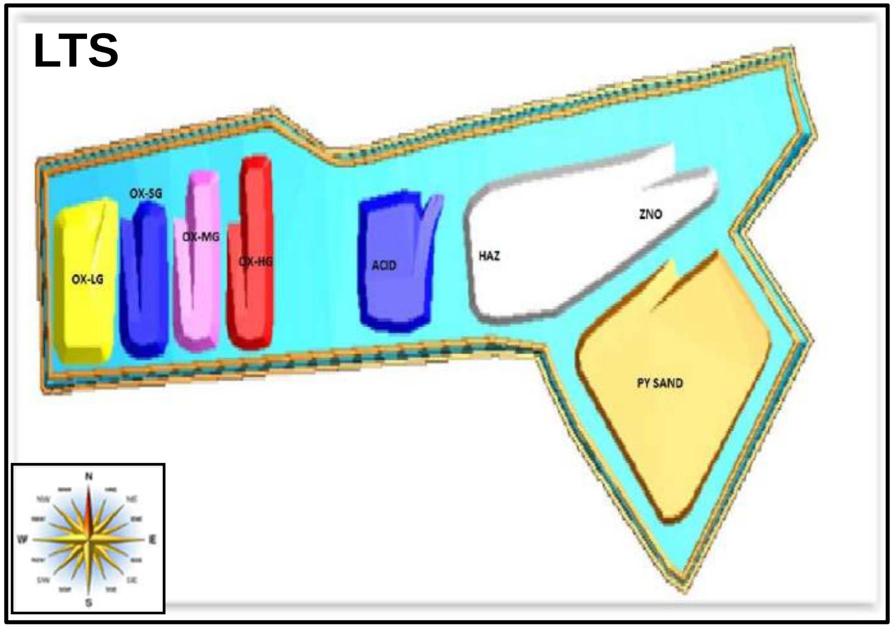
Blending

Maintaining a balanced mill feed blend ratio

- In order to meet the grade requirements of the process plant.
- Requirements are: 4-6 % Cu, <0.15% As & <1:8 Zn/Cu
- The blend depends on the mined ore block and stockpile grades.
- The mill throughput averages 6,575 tonnes per day.
- Ore is tipped at stockpiles (*HG,MG,LG and SLG)* from which it is reclaimed and blended.





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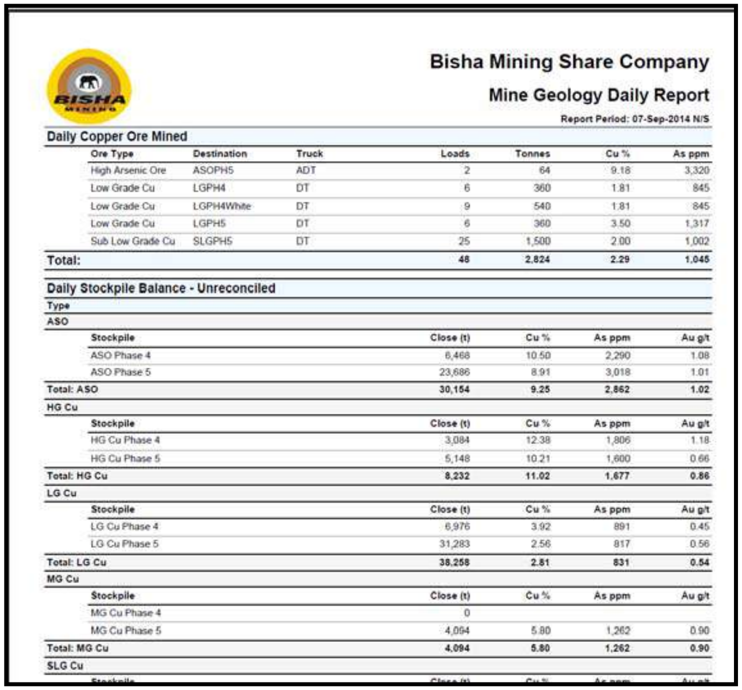
Data Management

- Acquire
- MPX (records all mine production for trucking and blending)
- Database designed by Cube Consulting™
- Importance:
  - for determining the grade and tonnes of ore material moved
  - Create daily, weekly and monthly reports.



Bisha Mining Share Company

Mine Geology Daily Report

Report Period: 07-Sep-2014 N/S

Daily Copper Ore Mined

Ore Type	Destination	Truck	Loads	Tonnes	Cu %	As ppm
High Arsenic Ore	ASOPH5	ADT	2	64	9.18	3,320
Low Grade Cu	LGPH4	DT	6	360	1.81	845
Low Grade Cu	LGPH4White	DT	9	540	1.81	845
Low Grade Cu	LGPH5	DT	6	360	3.50	1,317
Sub Low Grade Cu	SLGPH5	DT	25	1,500	2.00	1,002
Total:			**48**	**2,824**	**2.29**	**1,045**

Daily Stockpile Balance - Unreconciled

Type / Stockpile	Close (t)	Cu %	As ppm	Au g/t
ASO				
ASO Phase 4	6,468	10.50	2,290	1.08
ASO Phase 5	23,686	8.91	3,018	1.01
Total: ASO	**30,154**	**9.25**	**2,862**	**1.02**
HG Cu				
HG Cu Phase 4	3,084	12.38	1,806	1.18
HG Cu Phase 5	5,148	10.21	1,600	0.66
Total: HG Cu	**8,232**	**11.02**	**1,677**	**0.86**
LG Cu				
LG Cu Phase 4	6,976	3.92	891	0.45
LG Cu Phase 5	31,283	2.56	817	0.56
Total: LG Cu	**38,258**	**2.81**	**831**	**0.54**
MG Cu				
MG Cu Phase 4	0			
MG Cu Phase 5	4,094	5.80	1,262	0.90
Total: MG Cu	**4,094**	**5.80**	**1,262**	**0.90**
SLG Cu				

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Other Activities

Density test

- active ore block
- To get the density of different rock types
  - Bulk density (intact sample)
  - Loose density (swelled after the blast)
- To calculate tonnage.

Reactive Ground test

- To understand the reactivity of different material types in order to avoid pre-detonatio
- Bucket test

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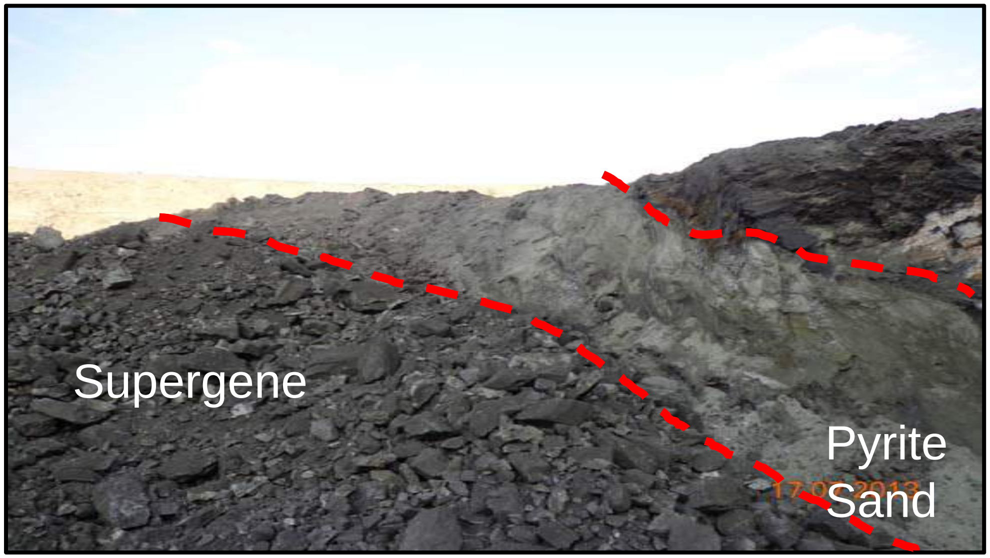
Challenges

Pyrite Sand (FeS_2)

Pyrite sand is a horizon of unconsolidated loose material that consists of fine, crystalline sand sized particles of pyrite.

Pyrite Sand



Phase 5 south 520mRL

- It creates a problem for the process plant.
- Requires a lot of attention to mine it selectively.
- Not consistent, making it difficult to estimate the tonnes.
- However it contains Au and Ag

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Challenges

Arsenic (As)

- Not wanted by the customers

Enargite (Cu_3AsS_4)

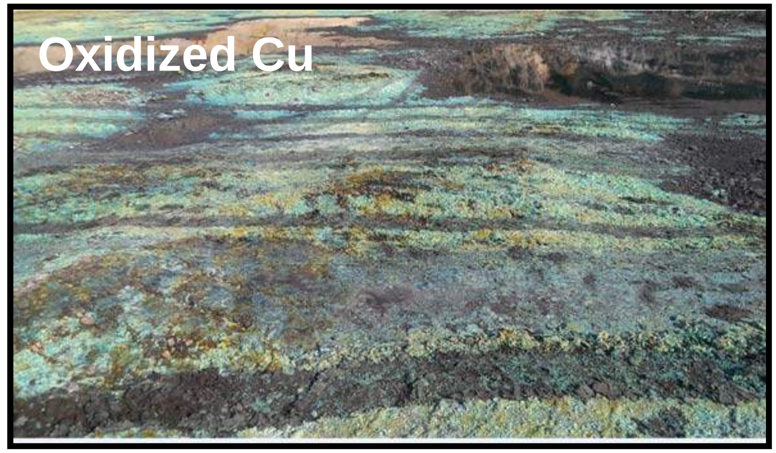
- couldn't yet identified from mapping and/or assaying
- Is recovered with the copper in concentrate

Pit Water

- Very acidic (pH ~ 1)
- corrosive issues
- Speed up oxidation

Reactive Ground

- Digenite, a catalyst for oxidation and the reaction is exothermic and that generates heat.
- Potential for premature detonation of explosives.



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Opportunities

Copper grade

- Copper grade this year is higher than the estimated reserve grade.

Zinc Ore

- Zinc ore starting to be mined in the southern part of the pit (Phase 5)
- Long term stockpile of zinc ore is ready in preparation for the Zinc processing plant.

Petrographic Laboratory

- Commission a petrographic laboratory on site
- Helps to analyze minerals using microscope
- Will play a vital role in identifying zones of enargite.

Petrographic Microscope

Bore Holes

- The bore holes drilled recently will help to minimize the dewatering challenges

Skill

- The department has gained good exposure to both gold and copper mining

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Achievements

Bisha Second Quarter Results

- Produced 21,528t of copper in the quarter including 8,065t in June 2014
- Sold 23,350t of copper, a 51% increase over Q1 2014
- Achieved C1 cash costs of US$ 1.05 per pound with strong earnings and cash flows

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Thank You

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Questions

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SUNRIDGE (AMSC) STAKEHOLDER ENGAGEMENT PLAN (SEP)

Asmara Mining Conference 2014
Asmara Palace
October 01 – 05, 2014
Yemane Kifle

1. Introduction

Stakeholder Engagement!

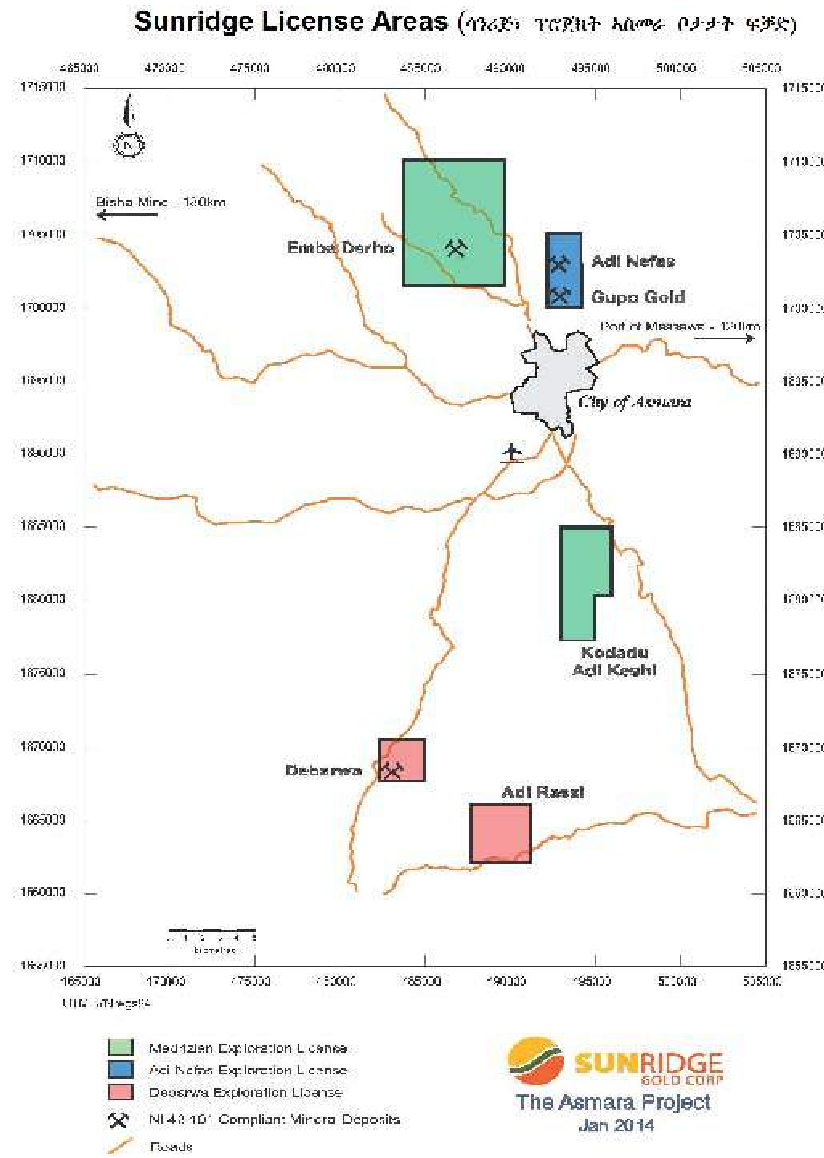
- **''Who are stakeholders?** Stakeholders are persons or groups who are **directly or indirectly affected by a project**, as well as those who may have **interests in a project** and/or the **ability to influence its outcome**, either positively or negatively''. IFC, Stakeholder Engagement: A Good Practice Handbook for Companies Doing Business in Emerging Markets, 2007.

- **Engagement:** is the formal & informal interaction/ communications between the project/company and the stakeholders .

Introduction---

- The SEP is prepared as a companion Doc. to SEIA for:
- Asmara Project, consisting of 4 deposits:

1. The Emba Derho copper/zinc/gold deposit;
2. The Adi Nefas zinc/copper /gold deposit;
3. The Gupo gold deposit; and
4. The Debarwa copper/zinc/gold deposit.



2. Policy, Legal & Administrative Framework

- Sunridge policies & standards
- Eritrean Government requirements
  - Proclamation to promote the development of Mineral Resources No. 69/1995, Article 43 (f) and the
  - Regulations on Mining Operations, 70/1995, Article 5 (j)
  - National Environmental Assessment Procedures & Guidelines (NEAPG), March 1999
- IFC Performance Standards and Guidelines
- Equator Principles.

3. *Project Description*

Project Location

- Northern properties

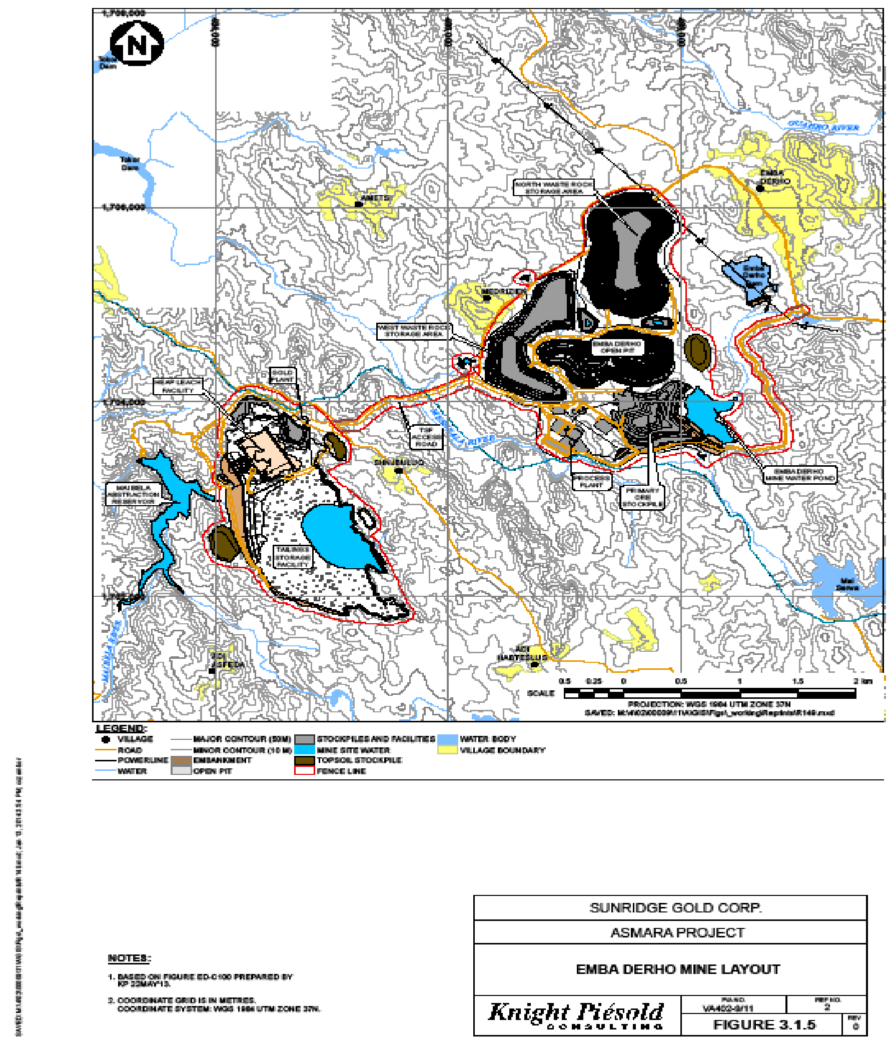
  Zoba Maekel, S/Zobas Serejeka, Berik & Akria

- Debarwa property

  Zoba Debub, S/Zoba Debarwa

Project Components

- Project integrates the mining, stockpiling & processing of 4 deposits



4. Project Area of Influence

Social & Economic Context

- *Populated area ~***6,359** *HH in Northern properties & ~***5,422 HH** in *Debarwa Property.*
- *Rural and peri-urban, villages and towns.*
- *Majority involved in Agricultural activities.*

Project Area of Influence -----

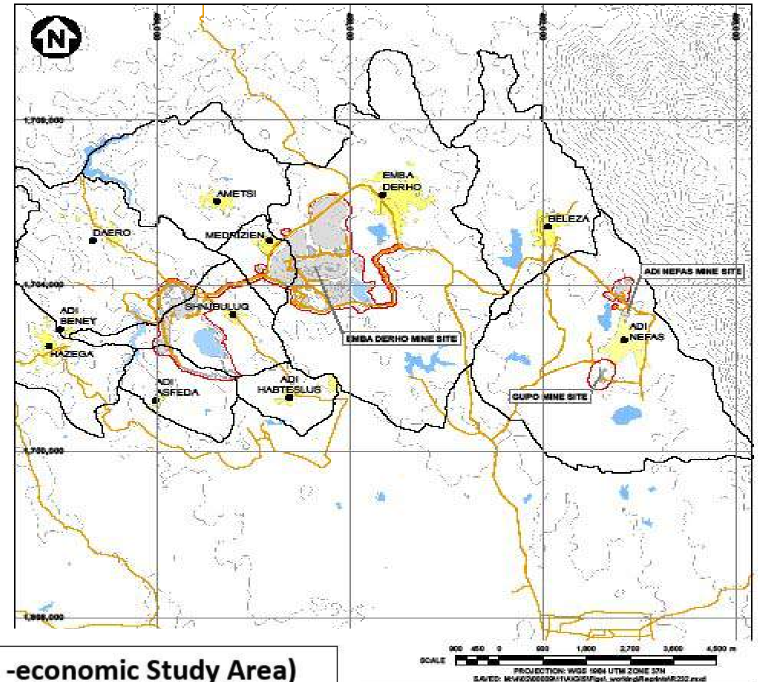
Direct Area of Influence

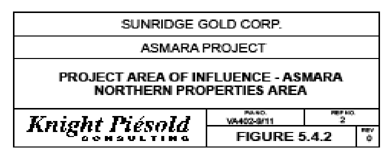
- Deposit, processing & waste facilities
- Communities affected by land acquisition
- Resettlement site
- Local transport corridors

Indirect Area of Influence

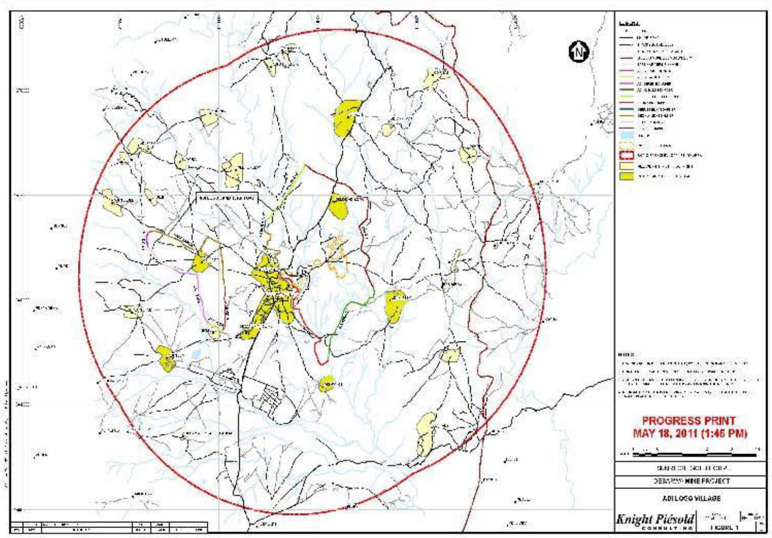
- 4 S/zobas, & 2 Zobas

(Zoba Maekel & Debub)





ቦታታት መጽናዕቲ ማሕበረ ቁጠባ (Socio -economic Study Area)



5. Stakeholder Engagement Conducted to Date

- Introduction & early consultation to Asmara Project
- Workshops & meetings at different level
- Mining Awareness and the SEIA Process
- Community Consultation
- Formal & Informal meetings with relevant Gov. authorities,

6. Stakeholder Identification and Analysis

Stakeholder Categorization

1. Primary Stakeholder Groups	**Description of Stakeholder Group**	
Project Affected Persons (PAPs)	Residents affected by physical displacement Land owners/users directly affected by land acquisition Any other person/business/entity economically displaced	
Affected Communities	DEBARWA Debarwa Town, Adi Logo, Shiketi , Adi Kubulo, Adi Watot,	EMBA DERHO / ADI NEFAS Emba Derho , Adi Nefas, Medrizien, Hazega, Adi Habteslus, Shinjibluk, Adi Beney / Daero, Adi Asfeda, Beleza Ametsi
Local Government	Local/Kebabi Administrators	
National & Regional Government	MoEM, MoLWE, IRC, Other relevant ministries & departments, Administrations of Zobas Maekal & Debub, Administrations of Sub- zobas Debarwa, Berik, Serejeka, & Akria	

Stakeholder Categorization-----

2. Secondary Stakeholder Groups	**Description of Stakeholder Group**
General Public	Population of Eritrea
Businesses	Businesses within the regional area and Eritrea
Non-Government and Quasi-Government Organizations	Community Based Organizations, National Unions, Scientific Institutes, & International NGOs
Investors, Financial Institutions	Current and potential investors, financial institutions
Media	Interested media organisations

3. Stakeholder Tacking and Monitoring

- **Stakeholder data base**

7. Approach to Stakeholder Engagement

- **Engagement Strategy & Objectives**

  Working closely with relevant Eritrean Authorities, to ensure it is carefully planned & undertaken in a timely fashion.

- **Managing Engagement during the Early Stages of the Project**

  Need to be careful about engagement particularly with local communities & managing expectations.

- **Engagement Tools and Techniques Such as:**
  - Informal meetings;
  - Public meetings;
  - Mining awareness materials;
  - Info. leaflets, posters & brochures;
  - Small group meetings or FGDs
  - Project information centres (**PICs)**;
  - Suggestion/comment books;
  - Website, correspondence & phone
  - Mine site visits or tours;
  - Open houses; and
  - Local media, radio spots & newspaper articles.

8. Stakeholder Engagement Program

The engagement process adopted three consecutive phases:

Phase 1: Planning and Scoping the SEIA Process;

Phase 2: Project Assessment Stage (including the SEIA report preparation); and

Phase 3: Project Construction and into Operations (including in preparation for Closure).

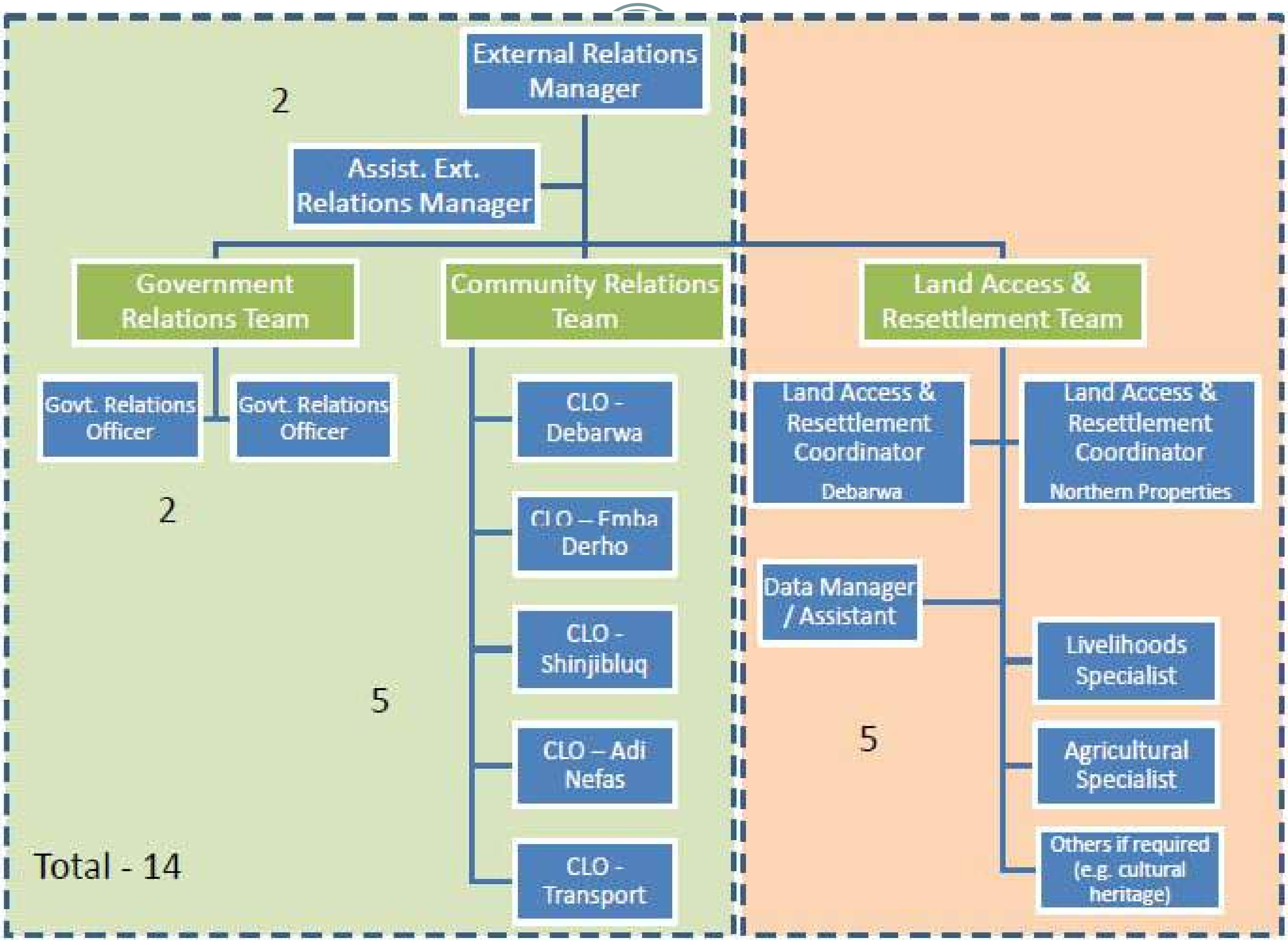
9. Resources and Responsibilities

Effective implementation of the SEP will require cooperation within the Project, and between the Project and its partners. Expected key participants are:

- AMSC & in particular their community & environment staff
- Environmental, social, engineering, and other consultants
- Local, regional and national government and their representatives
- Local organizations and community committees and their representatives;

Resources and Responsibilities-----

Proposed Community/External Relations Team



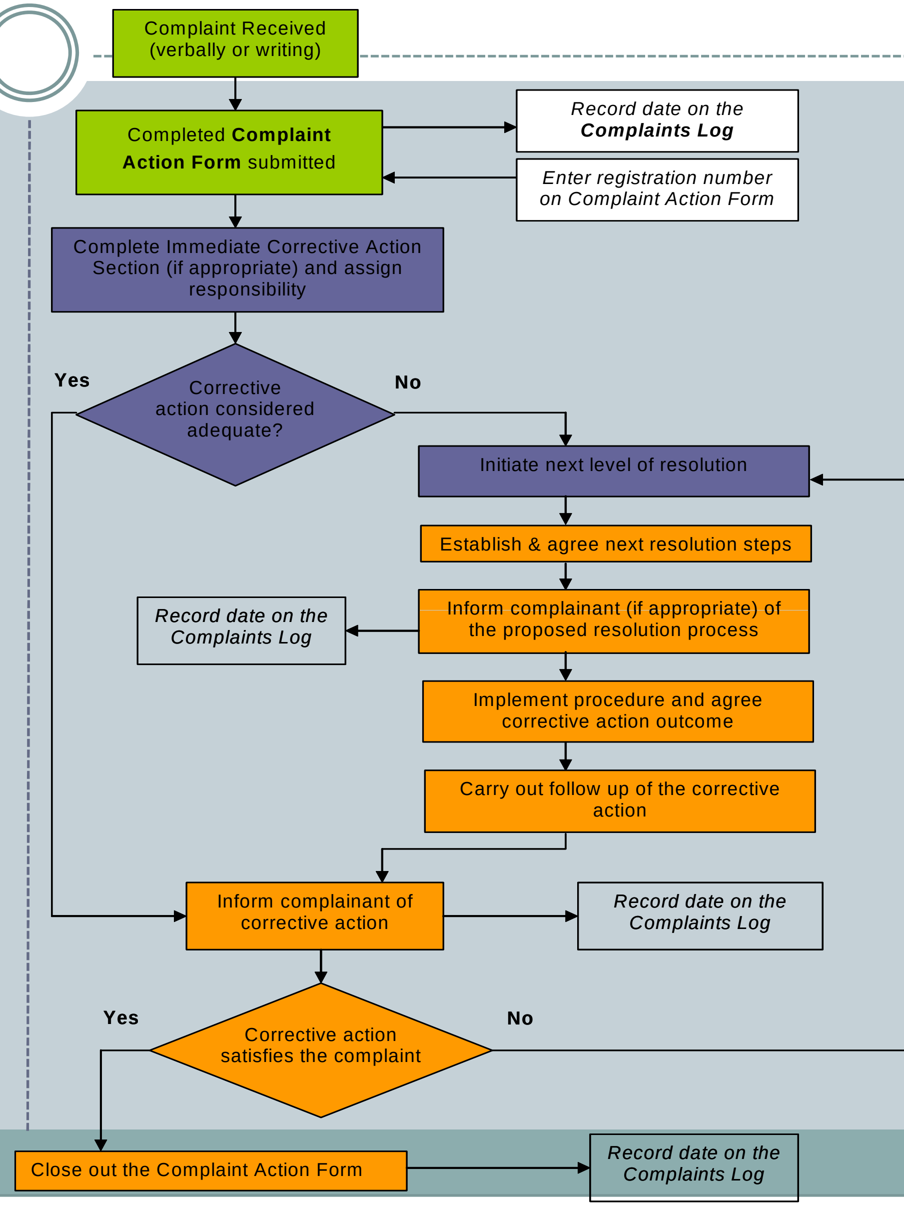
Team required between mid-2013 and approval of SEIA and granting of Mining Licence (approx. Oct 2014)

Additional Team required Post Mining Licence (although Resettlement Coordinators may need to be in place prior to this time)

10. Community Grievance Procedure

Key Steps in CGP:

- Receiving and documenting grievances
- Preliminary assessment
- Responding to grievances
- Investigating and resolving grievances
- Closing out grievances
- Following up with complainants.



11. Implementation Plan, Schedule and Budget

The key action commitments to be accomplished as identified in the SEP:

- Agricultural, Water & Rangeland Improvement program (AWRI)

Northern properties:

- lose of Arable land **336**ha (**14**%)
- lose of Rangeland **397ha (14%)**

Debarwa Property:

- lose of Arable land **26**ha (**3** %)
- lose of Rangeland **148** ha (**11**%)

- Community Assistance Plan (CAP)
- Resettlement Action plan (RAP). See next slide….

Potential Relocation/Resettlement/Replacement by Village

Northern Properties	Items Requiring Relocation/Resettlement/Replacement	
	Households /Structures	**Other Assets**
Adi Nefas	**6 Buildings** (Hidmo/Merebae) 1 Tiesa Plot & 47 Crop Residue	3 Eucalyptus Plantation sites
Emba Derho	None	31 Temporary Shallow Dug Wells 2 Permanent Shallow Dug Wells & Irrigation Lines
Medrizien	14 Crop Residue Fences	1 Community Well, 4 Temporary Shallow Dug Wells 6 Eucalyptus Plantation sites
Shnjbuluq	None	**Abune Buruk Church & its Spring**, 1 Water Reservoir,1 Pond, 1 Borehole, 5 Temporary Shallow Dug Wells, Large Portion Eucalyptus Plantation site
Daero	None	**School** , and its **Teacher's Residence** 2 Eucalyptus Plantation sites
Debarwa Property		
Debarwa Mereb	**74 Tiesa Plots,** 1 Hidmo & 52 Crop Residue Fences	**Factory Groundwater** Well and Lines Livestock Watering Points
Adi Logo	None	Livestock Watering Points & 15 Eucalyptus Plantation sites

12. Monitoring, Evaluation and Reporting

The Project will establish a stakeholder engagement monitoring system as part of the final SEP, and it will involve:

- Stakeholders at the same level with the dev't of SEP,
- Most importantly local stakeholders will be Involved,
- Range of internal & external reporting system to describe the progress of implementation,
- Independent & external evaluation of the SE will be considered.

Conclusion

The Sunridge/AMSC; SEP document & its ongoing and anticipated activities are aiming:

- To foster <u>two way communications</u> between the company and its stakeholders in order to have better understanding on the social and environmental situations around the project areas,
- To help in the <u>mitigation management planning & its implementations</u>, i.e., as much as possible to avoid or minimize the negative impacts on the one hand and enhance the positive impacts on the other.


The End
Thank You

SUNRIDGE GOLD CORP

PRE-MINING SURFACE AND GROUND WATER QUALITY BASELINE STUDIES

DEBARWA AND NORTH ASMARA MINING PROPERTIES

Prepared by: Sunridge Gold/AMSC

October 02, 2014

SUNRIDGE GOLD CORP

1. Background

Sunridge, as part of the Environmental Impact Assessment program, has undertaken different baseline studies through national and international consultancy

- Ground and surface water,
- Hydrometeorology,
- Air quality,
- Noise,
- Geochemistry,
- Soil,
- Vegetation,
- Wildlife and
- Aquatics

In accordance with the State of Eritrea National Environmental Assessment Procedure Guidelines (NEAPG) and International Finance Corporation (IFC) performance standards.

2. Ground and surface water quality assessment

The pre-mining water quality conditions and in-depth characterization will enable to predict potential direct changes in the water quality and/or indirect effects on receptors that may result from the mining activities.

Knight Piésold (KP), an international consulting company, advised Sunridge on procedures, sample locations and provided oversight on sample results and analysis,

In country, Global Resources Development and Management Consultants (GREDMCO) was initially an advisor and later on ground monitoring and sampling were undertaken through Sunridge.

Analysis to the accredited ALS laboratory located in the Czech Republic.

The assessment has been undertaken from December 2006 through January 2013.

Baseline water quality analytical and *in situ* data were compared to relevant guidelines with respect to the most sensitive receptors in the downstream environment .

❑ World Health Organization: Guidelines for Drinking-water Quality, Third Edition (WHO-DW) (WHO 2008)

❑ Food and Agriculture Organization of the United Nations (FAO):

❑ Republic of South Africa Water Quality Guidelines (DWAF 1996):

- Domestic Water Use, including drinking water, Volume 1 (SA-DW)
- Agricultural Use: Irrigation, Volume 4 (SA-Irrigation)
  Long-term use (LTV1) (ANZECC-LTV Irrigation)
  Short-term use (STV) (ANZECC-STV Irrigation)
- Agricultural Use: Livestock Watering, Volume 5 (SA-Livestock)

❑ Australian Government National Health and Medical Research Council:

- Australian Drinking Water Guidelines (AUS-DW) (NHMRC 2011)

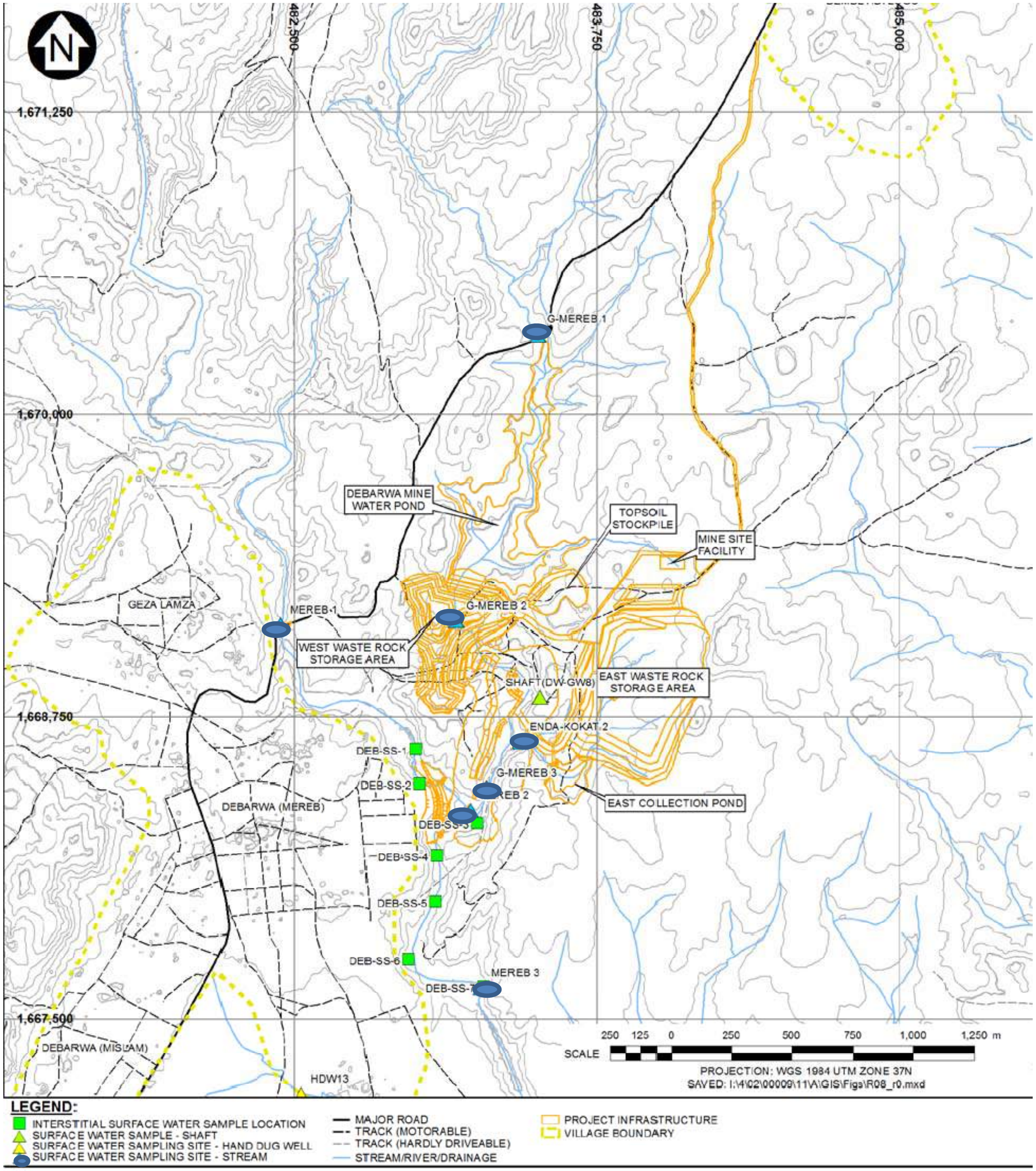
2.1 Study areas

In Debarwa area within the catchment of

1) Mereb,
2) Gual Mereb
3) Mai Noh rivers

In the Northern Property within the catchments of

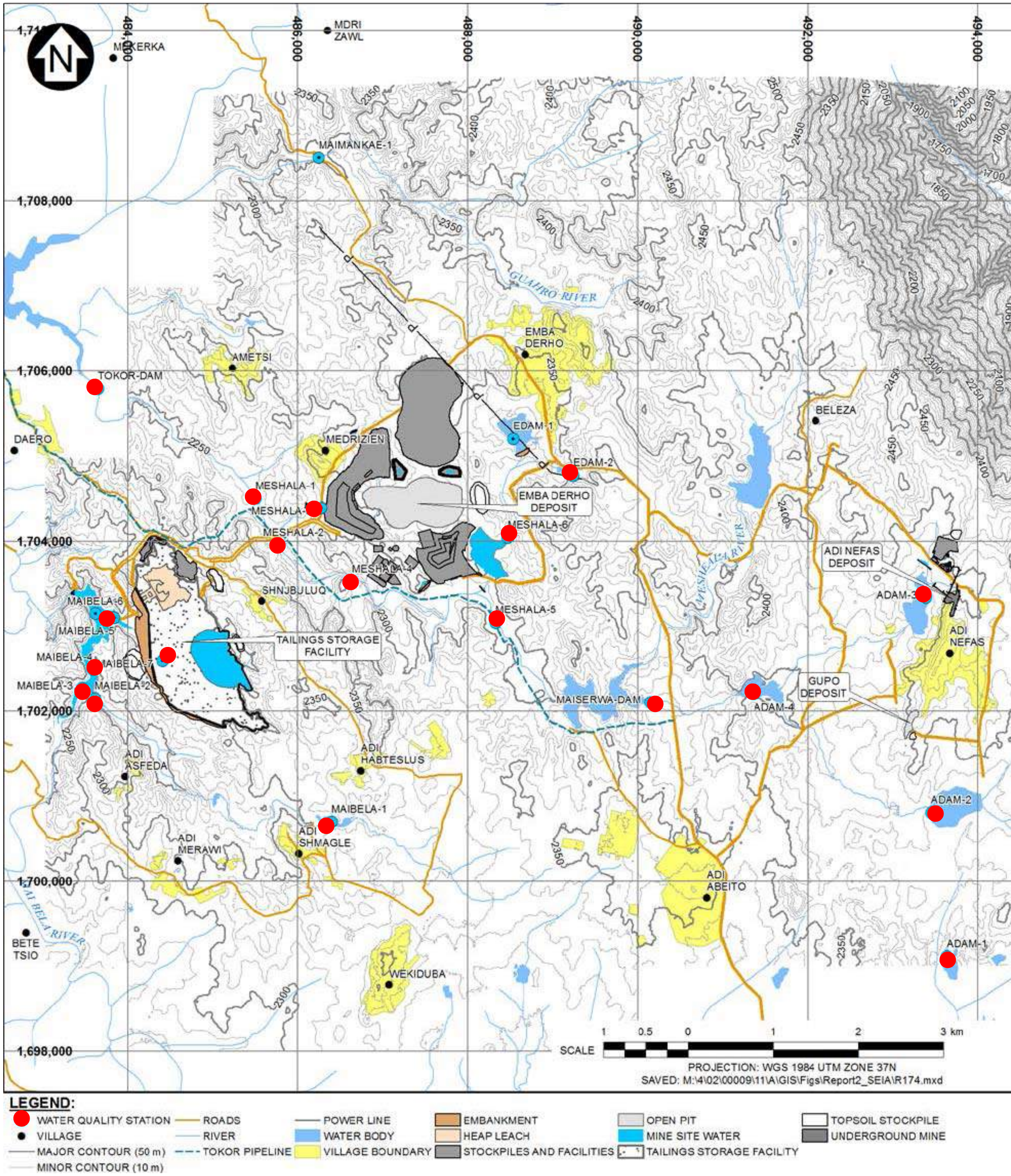
1) Mai Bela Rivers
2) Mai Kubo catchment (a tributary of the Mai Bela River)
3) Mesheala



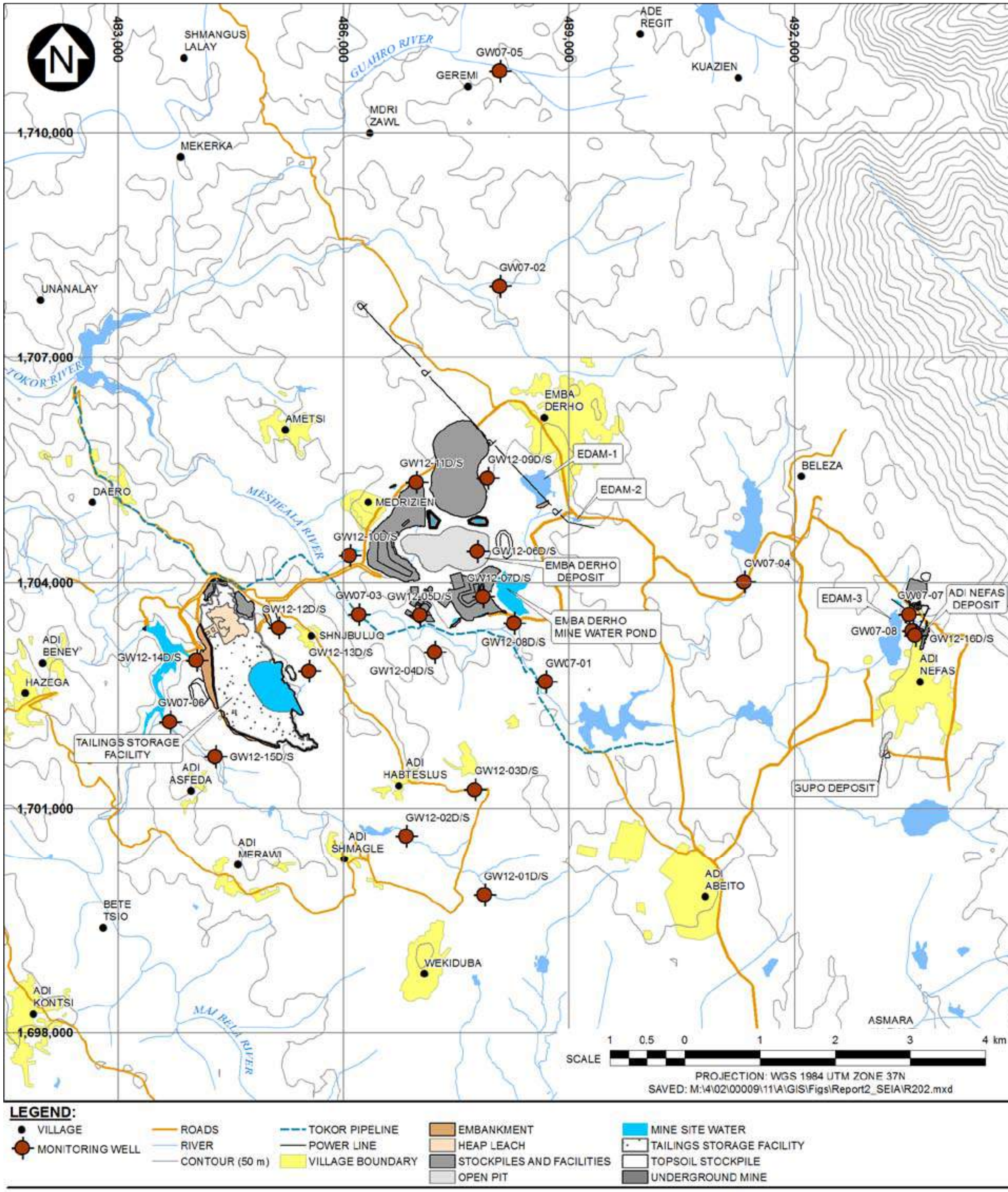
2.2 Surface water

In Debarwa area there were totally 16 different surface water quality assessment sites.

Water quality sampling was made monthly during the rainy season at the surface stream sites.



In Northern property there were totally 19 surface water quality assessment sites.



2.3 Ground water wells

In Debarwa area, there were totally 27 ground water wells.

In the Northern Property, there were totally 45 ground water wells.

Water quality sampling was undertaken quarterly.

3. Results

3.1 Surface water quality

Debarwa area

- The three rivers (Mereb, Gual Mereb and Mai Noh) have showed similar *in situ* characteristics (Water temp 19.8 ^{o}C to 29 ^{o}C; pH from 7.93 to 8.99; TDS from 97 mg/L to 290 mg/L).

- All alkalinity values within the Mereb, Gual Mereb and Mai Noh catchment water quality samples exceeded 20 mg/L, which is considered to have good buffering capacity and less sensitive to acidic inputs.

- Dissolved and total metal concentrations were generally low in all of the surface water sites;

- However, with some samples aluminium, copper, iron, manganese and silver showed elevated levels, exceeding drinking water quality and irrigation and livestock water quality guidelines.

SUNRIDGE GOLD CORP

DRINKING WATER QUALITY SUMMARY
SAMPLE SUMMARY & STATISTICS FOR MEREB 1

Date Sampled Time Sampled	20-Aug-07	03-Sep-07	26-Sep-07	Samples Collected	Min	Max	Mean	Median	Standard Deviation	WHO [b]	EPA [c]	HC [d]
In Situ Parameters												
Oxygen Dissolved (In Situ) (%)	102			1	102	102	102	102	-			
Oxygen Dissolved (In Situ)	6.7			1	6.7	6.7	6.7	6.7	-			
pH (In Situ)	8.3	8.31	8.41	3	8.3	8.41	8.34	8.31	0.0608		***6.5 to 8.5***	***6.5 to 8.5***
Specific Conductivity (In Situ) (uS/cm)	302	280	427	3	280	427	336	302	79.3			
Temperature (In Situ) (°C)	25.3	27.2	20	3	20	27.2	24.2	25.3	3.73			***15***
Total Dissolved Solids (In Situ)	145	134	206	3	133.8	205.9	161	144.6	38.9			***500***
Physical Tests												
Alkalinity (as CaCO3)	114	107	172	3	107.15	172	131	114	35.6			
Hardness (Total)	136	133	174	3	133	174	148	136	22.9			
pH	7.91	7.67	7.8	3	7.67	7.91	7.79	7.8	0.12		***6.5 to 8.5***	***6.5 to 8.5***
Specific Conductivity (uS/cm)	305	285	446	3	285.4	446	345	305	87.6			
Total Dissolved Solids	194	182	248	3	182	248	208	194	35.2		***500***	***500***
Total Suspended Solids	25	110	3.4	3	3.4	110	46.1	25	56.4			
Turbidity (NTU)	71.5	134	2.32	3	2.32	134	69.3	71.5	65.9			
Dissolved Anions												
Bromide (Dissolved)	0.15	0.15	0.25	3	0.15	0.25	0.183	0.15	0.0577			
Chloride (Dissolved)	12.4	12.2	23.6	3	12.2	23.6	16.1	12.4	6.52		***250***	***250***
Fluoride (Dissolved)	0.13	0.24	0.13	3	0.13	0.24	0.167	0.13	0.0635	1.5	4	1.5
Sulphate (Total)	18.8	15.7	28.7	3	15.7	28.7	21.1	18.8	6.79		***250***	***500***
Nutrients												
Ammonia (Total)	<0.04	<0.04	0.082	3	0.04	0.082	0.054	0.04	0.0242			
Nitrate (Dissolved)	0.4	0.74	<0.05	3	0.05	0.74	0.397	0.4	0.345	50	10	10
Nitrite (Dissolved)	<0.002	0.03	<0.002	3	0.002	0.03	0.0113	0.002	0.0162	3	1	3.2
Orthophosphate	0.04	0.13	0.04	3	0.04	0.13	0.07	0.04	0.052			
Cyanide												
Cyanide (Total)	<0.005	<0.005	<0.005	3	-	-	-	-	-	0.07		0.2
Dissolved Metals												
Aluminum (Dissolved)	0.0404	0.0236	0.044	3	-	-	-	-	-		***0.2***	***0.2***
Antimony (Dissolved)	0.0002	0.0003	0.0005	3	-	-	-	-	-	0.02	0.006	0.006
Arsenic (Dissolved)	<0.0005	<0.0005	<0.0005	3	-	-	-	-	-	0.01	0.01	0.01
Barium (Dissolved)	0.012	0.007	0.007	3	0.007	0.012	0.0087	0.007	0.00289	0.7	2	1
Beryllium (Dissolved)	<0.0005	<0.0005	<0.0005	3	-	-	-	-	-		0.004	
Boron (Dissolved)	<0.02	<0.02	<0.02	3	-	-	-	-	-	0.5		5
Cadmium (Dissolved)	<0.00005	<0.00005	<0.00005	3	-	-	-	-	-	0.003	0.005	0.005
Calcium (Dissolved)	27.8	31.1	40.1	3	27.8	40.1	33	31.1	6.37			
Chromium (Dissolved)	0.0006	<0.0005	<0.0005	3	-	-	-	-	-		0.1	0.05
Cobalt (Dissolved)	0.0001	0.0002	0.0002	3	-	-	-	-	-			
Copper (Dissolved)	0.0046	0.0044	0.0011	3	-	-	-	-	-	2	***1.3***	1
Iron (Dissolved)	0.011	0.023	0.108	3	0.011	0.108	0.0473	0.023	0.0529		***0.3***	***0.3***
Lead (Dissolved)	**0.0013**	<0.0001	<0.0001	3	-	-	-	-	-	0.001	0.015	0.01
Lithium (Dissolved)	<0.001	<0.001	<0.001	3	-	-	-	-	-			
Magnesium (Dissolved)	11.9	13.7	18.4	3	11.9	18.4	14.7	13.7	3.36			
Manganese (Dissolved)	0.0006	0.001	0.0059	3	-	-	-	-	-	0.4	***0.05***	***0.05***
Mercury (Dissolved)	<0.0003	<0.0003	<0.0003	3	-	-	-	-	-	0.006	0.002	0.001

SUNRIDGE GOLD CORP

Northern Property

- The physical characteristics of the water quality in each catchment are quite different. Total hardness in the Mesheala catchment is characterized by soft to hard water. In contrast, the Mai Bela catchment is characterized by moderately hard to very hard water with high salinity range.

- Both watersheds have very alkaline water (Mai Bela catchment: 272 mg/L $CaCO_3$, and Mesheala catchment: 127 mg/L $CaCO_3$).

- pH remains quite similar for Mai Bela and Mesheala catchment despite the physical characteristics of the water quality in each catchment are quite different.

- The majority of measured metals were available at concentrations below relevant guidelines.
  - In Mesheala catchment, antimony and lead concentrations were slightly elevated and
  - In Mai Bela catchment total aluminum, total iron, total lead and total manganese concentrations are consistently elevated.

SUNRIDGE GOLD CORP

Example: In Situ Measurements and Physical Tests within the Mai Bela catchment

Parameter	Samples Collected	Minimum	Median	Mean	Maximum	Standard Deviation
***In Situ* Parameters**						
pH	162	6.75	8.05	8.1	9.98	0.515
Oxygen Dissolved (%)	142	7.4	97.4	120	990	94.6
Oxygen Dissolved (mg/L)	148	0.017	6.66	8.58	86.9	8.39
Salinity (ppt)	56	4E-07	0.46	0.742	4.67	0.891
Temperature (°C)	161	8.8	19.6	19.5	26	3.15
Physical Tests						
Alkalinity (Total as $CaCO_3$)	108	14.4	299	272	679	159
Bicarbonate Alkalinity (mg $CaCO_3$/L)	55	0.8	321	289	678	169
Carbonate Alkalinity (mg $CaCO_3$/L)	55	0.8	0.8	1.35	4.4	0.766
Conductivity (µS/cm)	7	256	265	446	1000	312
Dissolved Hardness as $CaCO_3$ (mg $CaCO_3$/L)	143	0.02	351	334	937	195
Specific Conductivity (µS/cm)	156	1.1	831	1030	13600	1240
Total Dissolved Solids (mg/L)	163	10	456	520	2480	400
Total Suspended Solids (mg/L)	163	2	13.8	67.7	1080	172
Turbidity (NTU)	163	0.22	7.57	93.1	2570	300

SUNRIDGE GOLD CORP

3.2 Ground water quality

Debarwa area

- *In situ* characteristics of ground water (Water temperature from 24 to 27.5 ^{o}C; pH values falls within 7.07 to 8.11; TDS concentrations ranges from 165.6 mg/L to 734 mg/L)

- Alkalinity concentrations ranges from 157 to 485 mg/L $CaCO_3$ and hardness concentrations range from 172 to 640 mg/L $CaCO_3$

- TDS values all fall below 1,000 mg/L and as such the groundwater in the Debarwa area is classified as freshwater

- Generally, total and dissolved metal concentrations (lead, aluminum, manganese, copper and iron) showed elevated value in most of the ground water sites.

SUNRIDGE GOLD CORP

Parameter	Samples	Min	Max	Mean	Median	SD
			In Situ Parameters			
Conductivity (µS/cm)	15	6.73	1278	611	511	317
Oxygen Dissolved (mg/L)	29	0.59	6.8	2.3	2.3	1.39
pH	45	6.28	9.23	7.25	7.25	0.774
Salinity (ppm)	8	0.19	0.62	0.305	0.24	0.138
Specific Conductivity (µS/cm)	38	400.3	1247	730	786	196
Temperature (°C)	44	22	34.6	25.9	25.4	2.23
Total Dissolved Solids (mg/L)	31	260.3	786	397	409	87.9
			Physical Tests			
Alkalinity (Total as CaCO3)	22	136	471	236	204	79.3
Carbonate Alkalinity	8	606	8170	1696	785	2617
Conductivity (µS/cm)	15	0.245	5.84	2.21	2.16	1.51
Hardness as CaCO3	26	0.0734	4.05	1.37	1.47	1.04
Hydroxide Alkalinity	6	8.3	101	54.2	8.4	50.2
pH	44	6.5	10.3	7.77	7.78	0.84
Specific Conductivity (µS/cm)	36	351	1220	662	633	214
Total Dissolved Solids	44	180	694	384	358	115
Total Suspended Solids	44	2	1310	87.8	29	231
Turbidity (NTU)	44	0.14	834	72.1	13.1	146
Bromide (Dissolved)	42	0.082	1.08	0.283	0.21	0.248
Chloride (Dissolved)	44	5.84	107	27.6	22	24.2
Fluoride (Dissolved)	44	0.126	1.17	0.477	0.475	0.228
Sulphate (Total)	39	0.59	96.6	31.4	28.2	23.6
Ammonia (Total)	46	0.0083	0.504	0.0724	0.04	0.0942
Nitrate (as N)	44	0.005	7.49	0.981	0.05	2.04
Nitrite (as N)	44	0.001	0.23	0.0296	0.01	0.0475
Nitrogen Kjeldahl (Total)	20	0.5	1.27	0.559	0.5	0.191
Orthophosphate (Dissolved)	44	0.01	0.04	0.0138	0.01	0.00687
Phosphate (Dissolved)	11	0.01	0.05	0.024	0.017	0.0148
Phosphorus (Dissolved)	33	0.01	0.05	0.0154	0.011	0.00974
Cyanide (Total)	41	0.005	0.005	0.005	0.005	1.95x10[illegible]
Cyanide (WAD)	23	0.005	0.005	0.005	0.005	1.17x10[illegible]

In Situ and General Chemistry in Groundwater in the Gual Mereb Catchment

Northern property:

- Groundwater quality in the project area can be generally characterized slightly alkaline, with very good buffering capacity .
- The concentrations of major anions in the groundwater samples did not exceed guidelines.
- Total dissolved solids (TDS) concentrations are elevated although all samples are less than 1,000 mg/L and as such are classified as freshwater.
- Generally, in the Northern property Iron, manganese, and molybdenum were the only metals to exceed any guidelines in this area.

SUNRIDGE GOLD CORP

Parameter	Samples	Minimum	Maximum	Mean	Median	Standard Deviation
In Situ Parameters						
Oxygen Dissolved (mg/L)	5	2.69	4.68	3.832	4.01	0.73
pH	6	7.04	7.44	7.21	7.21	0.13
Specific Conductivity (µS/cm)	6	873	914	887	883	14
Temperature (°C)	6	20.9	22.7	22.1	22.2	0.6
Total Dissolved Solids (mg/L)	6	428	449	435	434	7
Physical Tests						
Alkalinity (Total as CaCO3)	6	188	328	299	319	55
Hardness as CaCO3	4	389	401	395	396	5
pH	6	7.6	8.2	7.9	7.8	0.2
Specific Conductivity (µS/cm)	3	867	930	905	917	33
Total Dissolved Solids	6	458	606	521	524	51
Total Suspended Solids	6	35.5	206	81	52.6	65
Turbidity (NTU)	6	7.61	155	54.535	41.95	52.6
Bromide (Dissolved)	6	0.54	0.8	0.6	0.6	0.1
Chloride (Dissolved)	6	55.9	72.3	63.8	63.6	5.7
Fluoride (Dissolved)	6	0.18	0.2	0.2	0.2	0.014
Sulphate (Total)	6	57.5	75.7	66.3	65.9	6.4
Ammonia (Total)	6	0.04	1.5	0.3	0.0	0.6
Nitrate (as N)	6	1.31	2.1	1.6	1.6	0.3
Nitrite (as N)	6	0	0.002	0.002	0.002	0.001
Orthophosphate (Dissolved)	6	0.01	0.02	0.012	0.010	0.004
Phosphorus (Dissolved)	4	0.01	0.02	0.0125	0.01	0.005
Cyanide (Total)	6	0.005	0.005	0.005	0.005	0

Example: General Chemistry laboratory result for one well in Adi Nefas area

5. Mitigation plans

Sunridge has prepared SEIA and SEMP to mitigate potential impacts. The following are some management plans related to water quality preservation both for the ground and surface water:

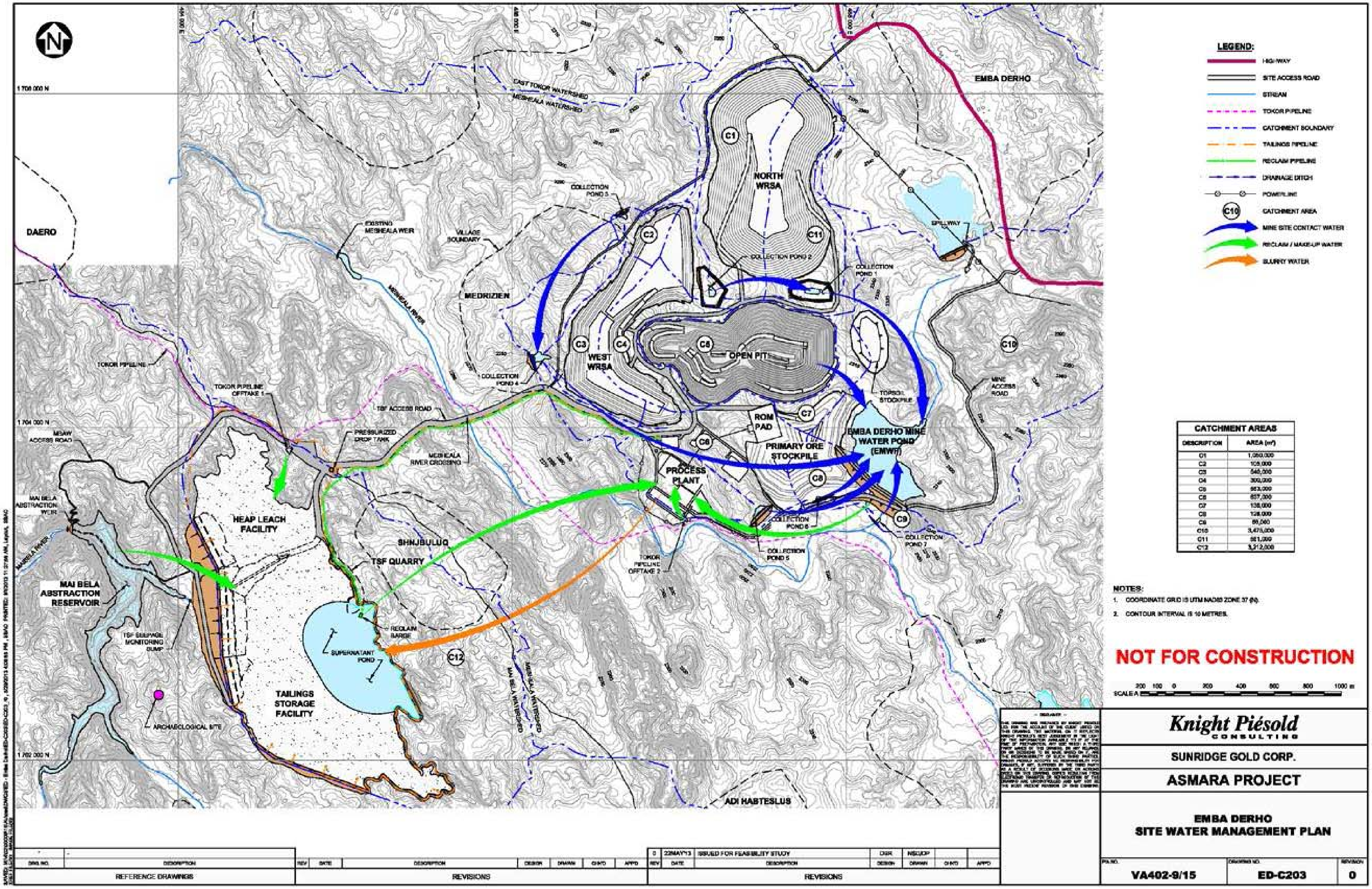
- Water Management Plan
- Waste Rock Management Plan
- Hazardous Substances Management Plan
- Conceptual Closure Plan

Strategically, the mine design and water management policy plans and enforces all contact water to be preserved and captured for reused in the mine process.

In addition, the Tailings Storage Facility (TSF) and collection ponds will have adequate liners and compacted earth works to minimize ground infiltration.

Naturally, the ground water buffering capacity will neutralise the low pH generation created by the Potentially Acid Generating (PAG) stockpiles.

SGC/AMSC have begun reclamation testing to understand how to best reclaim on the existing Nippon waste dumps in Debarwa.


EMBA DERHO
DAERO
MEDRIZIEN
SHNJBULUQ
ADI HABTESLUS
EAST TOKOR WATERSHED
MESHEALA WATERSHED
EXISTING MESHEALA WEIR
VILLAGE BOUNDARY
MESHEALA RIVER
COLLECTION POND 3
COLLECTION POND 2
COLLECTION POND 1
COLLECTION POND 4
COLLECTION POND 5
COLLECTION POND 6
COLLECTION POND 7
NORTH WRSA
WEST WRSA
OPEN PIT
SPILLWAY
TOPSOIL STOCKPILE
MINE ACCESS ROAD
ROM PAD
PRIMARY ORE STOCKPILE
EMBA DERHO MINE WATER POND (EMWP)
PROCESS PLANT
TOKOR PIPELINE
TOKOR PIPELINE OFFTAKE 1
TOKOR PIPELINE OFFTAKE 2
TSF ACCESS ROAD
PRESSURIZED DROP TANK
MESHEALA RIVER CROSSING
MSAW ACCESS ROAD
MAI BELA ABSTRACTION WEIR
MAI BELA ABSTRACTION RESERVOIR
HEAP LEACH FACILITY
TSF QUARRY
RECLAIM BARGE
SUPERNATANT POND
TSF SEEPAGE MONITORING SUMP
TAILINGS STORAGE FACILITY
ARCHAEOLOGICAL SITE
MAI BELA WATERSHED
MESHEALA WATERSHED
C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
C12
1 708 000 N
1 704 000 N
1 702 000 N
LEGEND:
HIGHWAY
SITE ACCESS ROAD
STREAM
TOKOR PIPELINE
CATCHMENT BOUNDARY
TAILINGS PIPELINE
RECLAIM PIPELINE
DRAINAGE DITCH
POWERLINE
CATCHMENT AREA
MINE SITE CONTACT WATER
RECLAIM / MAKE-UP WATER
SLURRY WATER
CATCHMENT AREAS
DESCRIPTION | AREA (m²)
C1 | 1,050,000
C2 | 105,000
C3 | 546,000
C4 | 300,000
C5 | 853,000
C6 | 657,000
C7 | 136,000
C8 | 128,000
C9 | 86,000
C10 | 3,475,000
C11 | 551,000
C12 | 3,212,000
NOTES:
1. COORDINATE GRID IS UTM NAD83 ZONE 37 (N).
2. CONTOUR INTERVAL IS 10 METRES.
NOT FOR CONSTRUCTION
SCALE A
Knight Piésold CONSULTING
SUNRIDGE GOLD CORP.
ASMARA PROJECT
EMBA DERHO
SITE WATER MANAGEMENT PLAN
VA402-9/15
ED-C203
0
22MAY'13 ISSUED FOR FEASIBILITY STUDY
REFERENCE DRAWINGS
REVISIONS

At closure the surface and ground water quality will be preserved to allow the people, vegetation, domestic and wildlife to maintain or improve their existing conditions.

Thank you!