INTERNATIONAL BASE METALS LIMITED

OMITIOMIRE COPPER DEPOSIT, NAMIBIA:

THE ROCKY ROAD TOWARDS PROJECT DEVELOPMENT

- Ken Maiden & Karl Hartmann

There should be warning signs for would-be mineral exploration entrepreneurs


International Base Metals Limited (IBML)
Mount Kelly, Northwest
Queensland, 2003


Mount Kelly,
May 2014

South Australia

- **Targets:**
  - **IOCG in the Gawler Block**
  - **Copper in the Adelaide Fold Belt**
- **Copper Range Ltd listed in 2006**

Flinders Ranges, 2006

Central Queensland

- **Target: Gold in Drummond Basin**
- **Company listed in 2007**
- **Discovered Anthony porphyry Mo deposit in 2007-08**
- **Zamia Metals still going well**

Clermont district, 2004

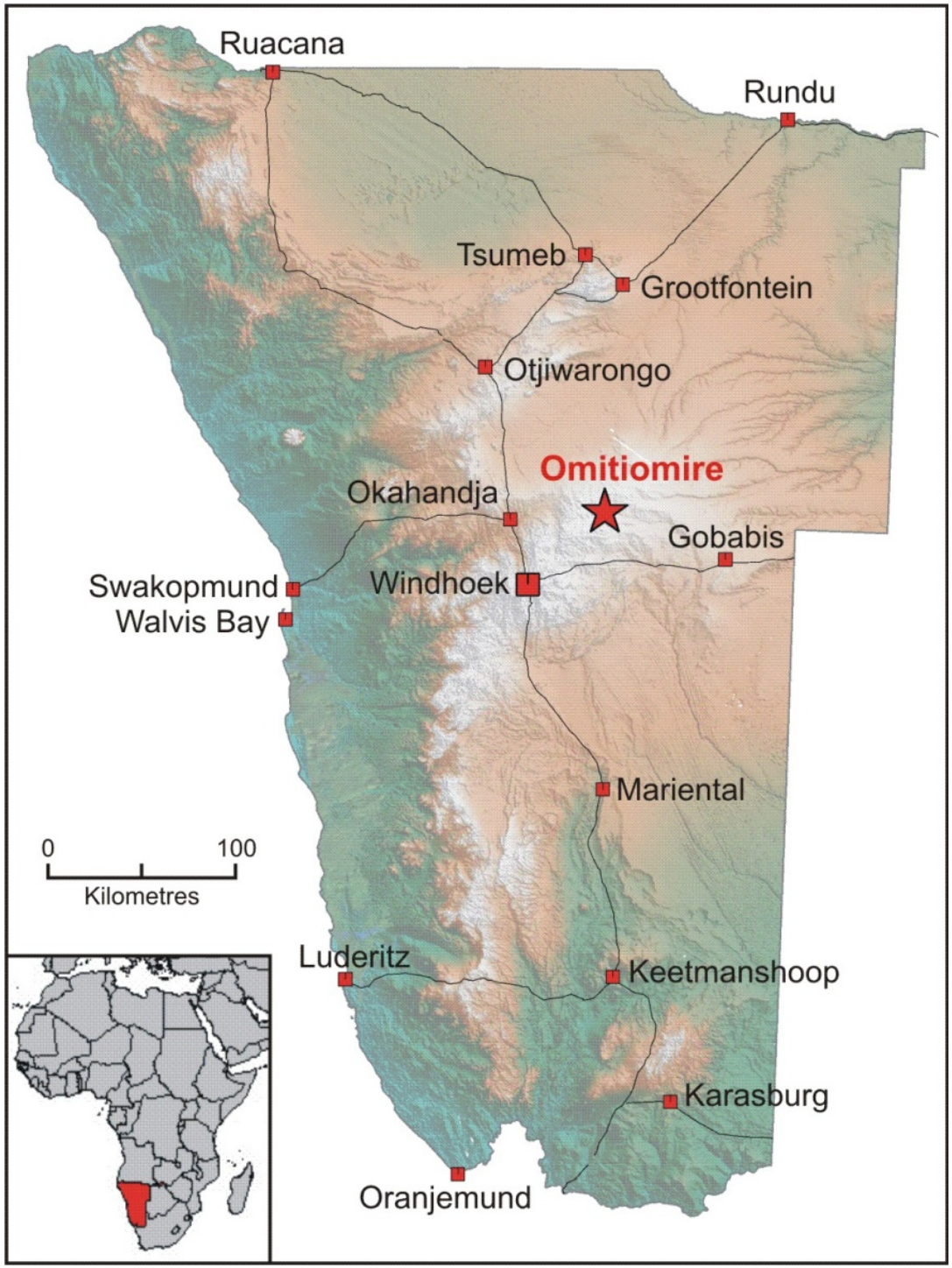
2006: Looking for a new project

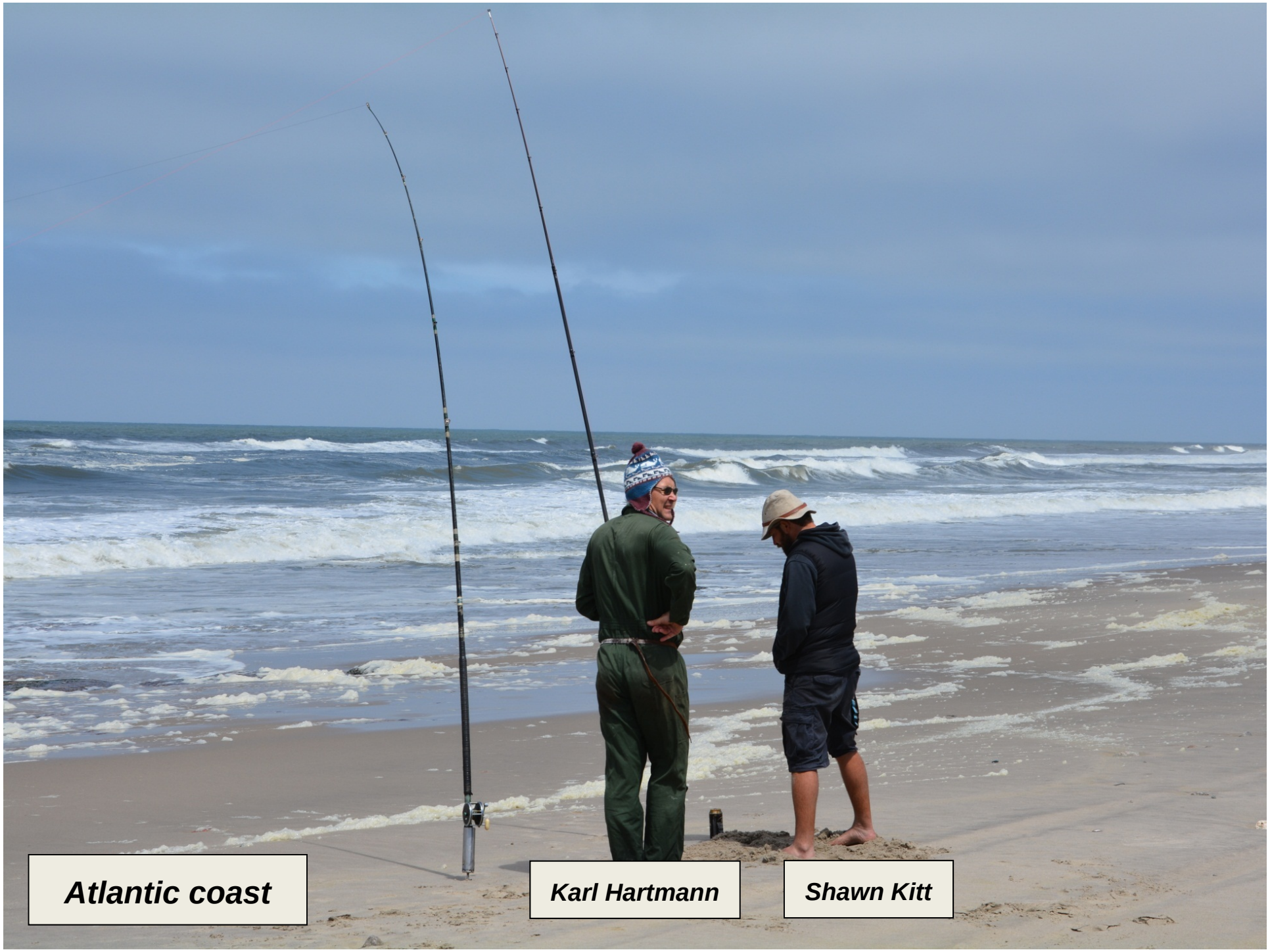
Isn’t it dangerous in Africa ?

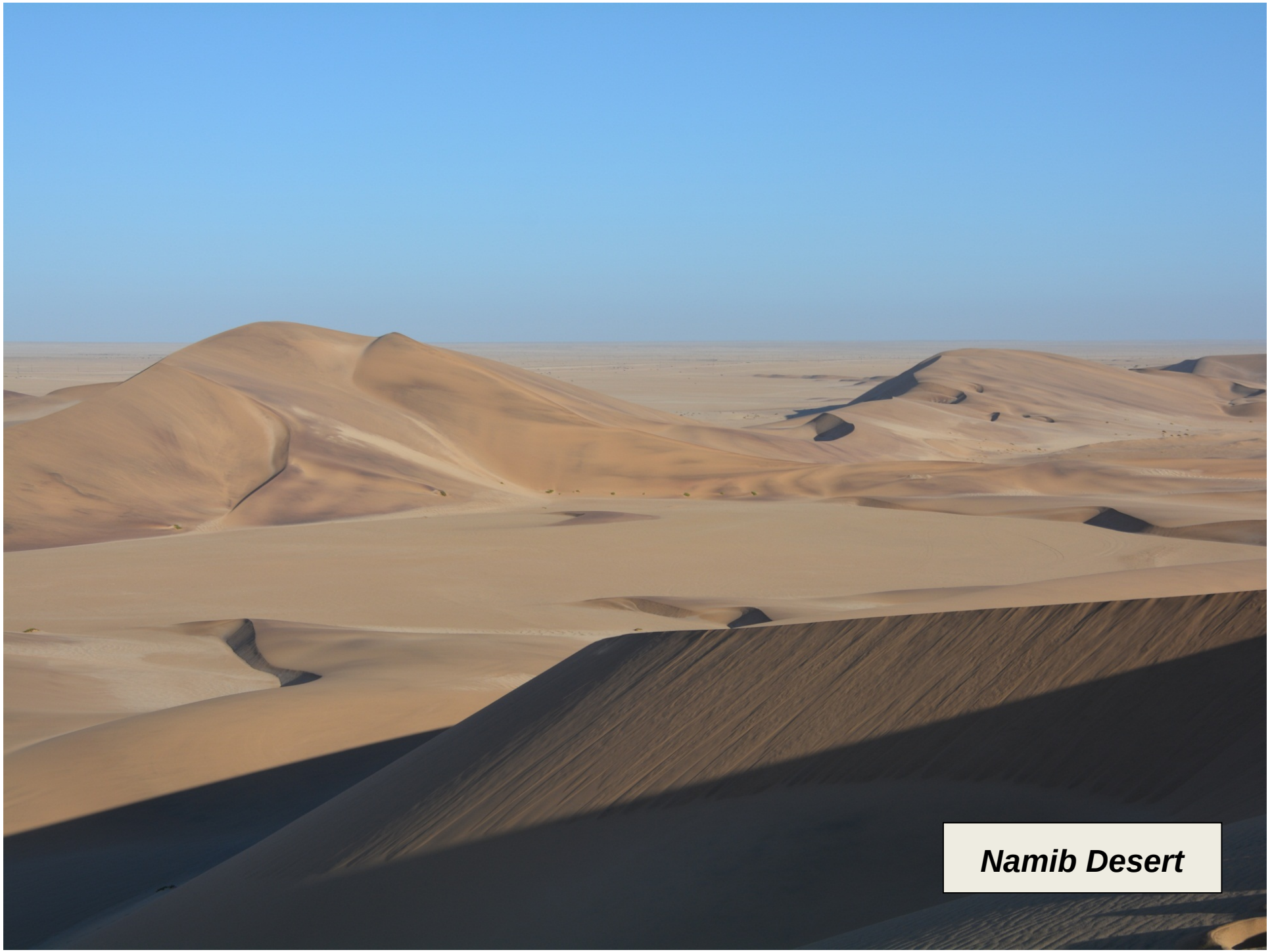
Namibia

- **Area: 800,000 km^2**

  (about the same as NSW)
- **Population ~ 2 million**
- **Very arid coastal fringe - Namib Desert**
- **Central area to ~ 2000m - savannah grassland & woodland**
- **Eastern: Kalahari sand sheet, grass plains & open woodland**
- **North: Sufficient rainfall for subsistence agriculture**



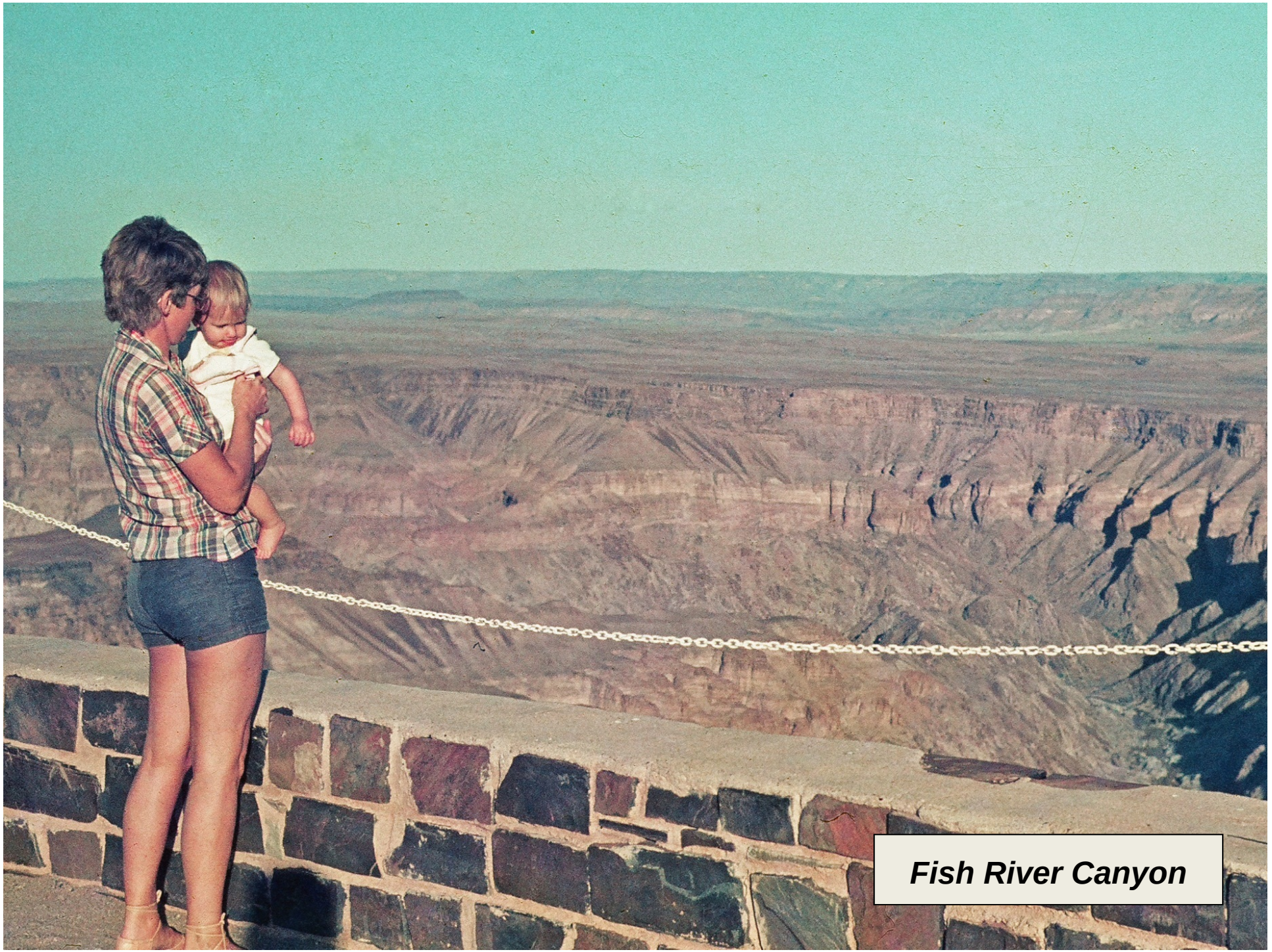

Atlantic coast
Karl Hartmann
Shawn Kitt

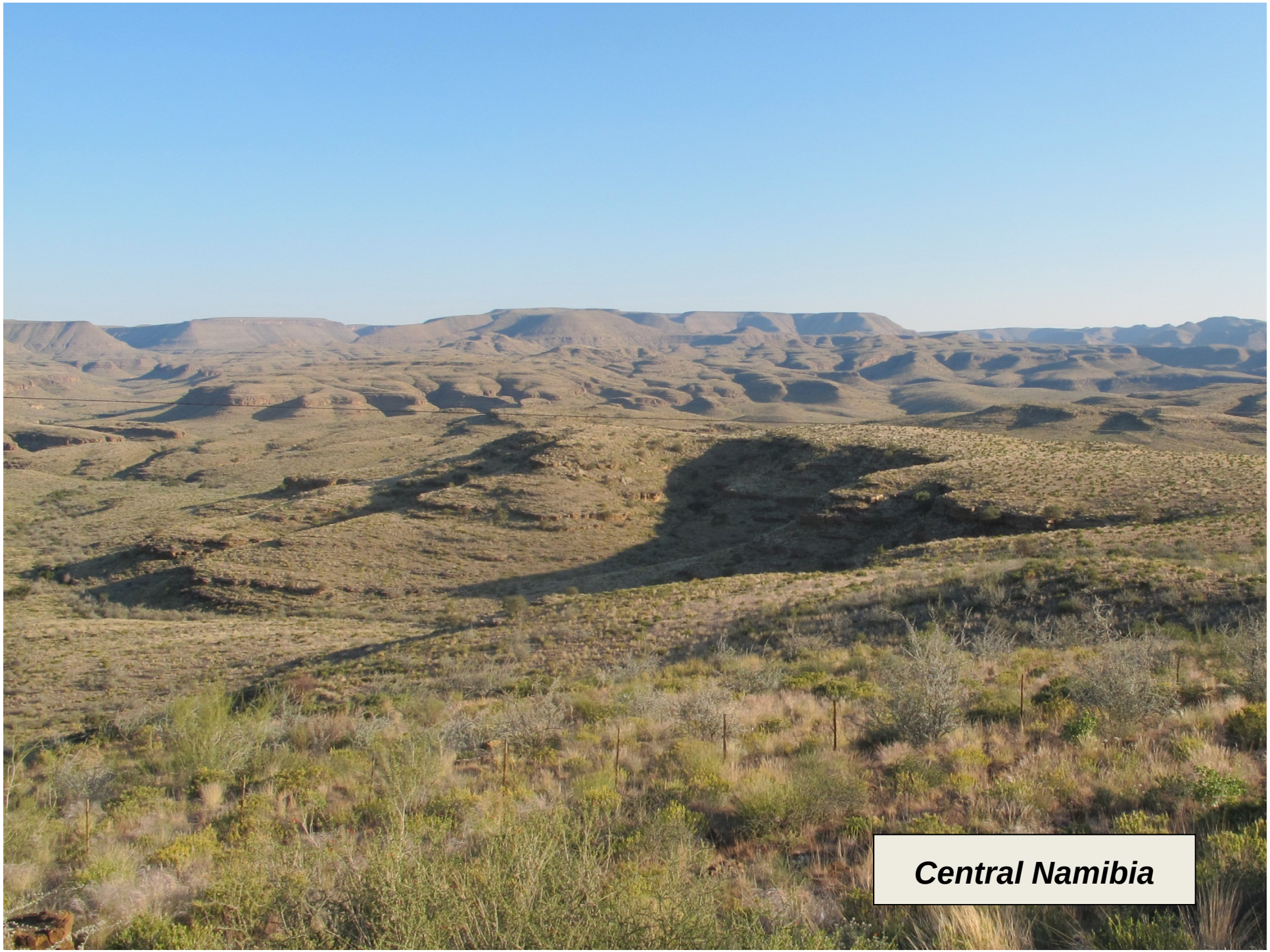

Namib Desert


Namib Desert

Wide open spaces


Spitzkoppe

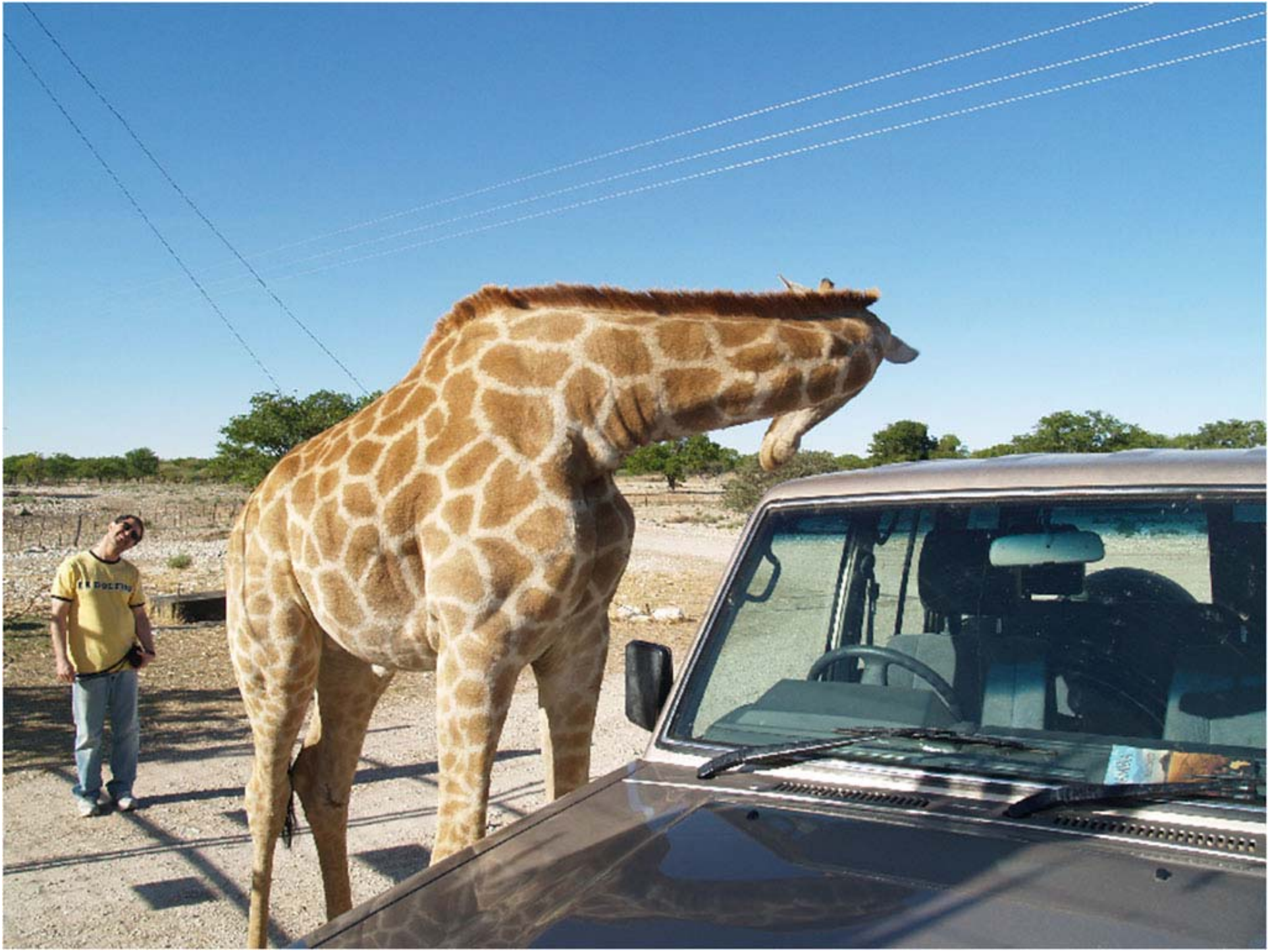

Fish River Canyon


Central Namibia


Kalahari


Windhoek

Etosha National Park




Ran into a wart-hog


Opuwo

Mining Industry

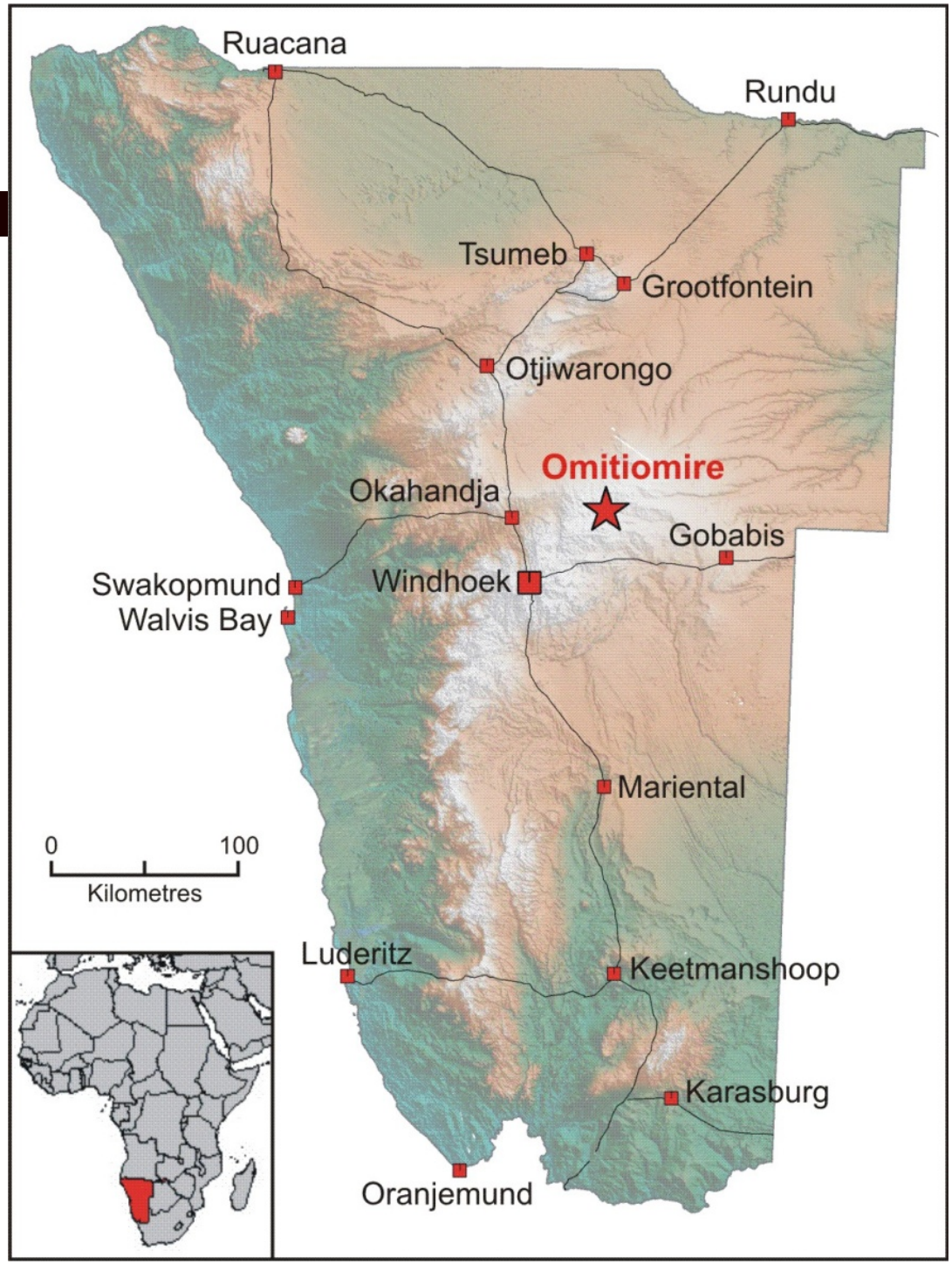
Beach & offshore diamonds

Skorpion zinc

Rössing uranium

Why Namibia ?

- **Good tenement system**
- **Good mining legislation**
- **Effective bureaucracy**
- **Good data (geological maps, geophysical coverage, historic exploration data)**
- **Good infrastructure**
- **Low political risk**



Fraser Institute survey 2013

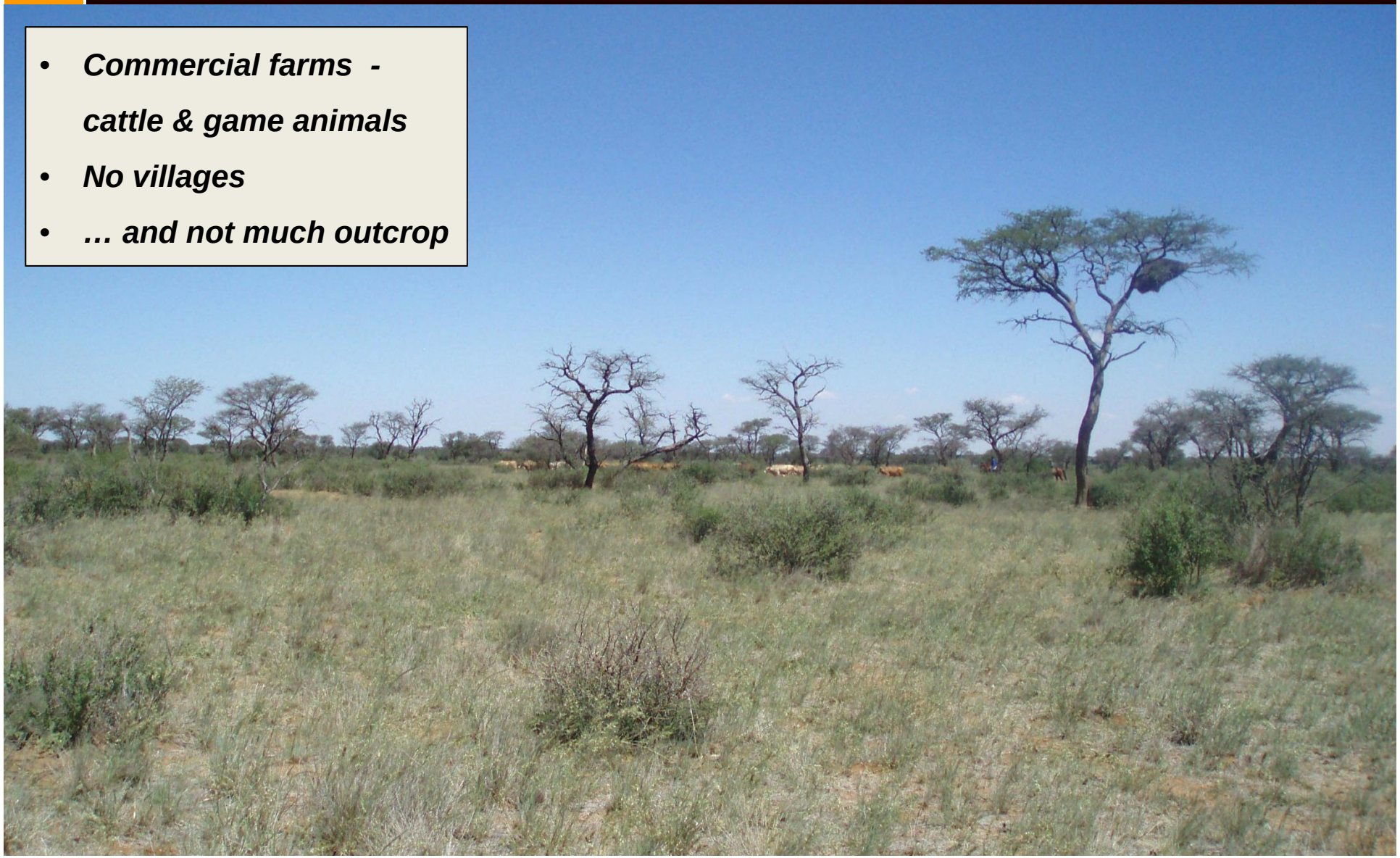
Investment attractiveness index - Namibia 34/112

- **Below Botswana & Ghana, above all other African countries**
- **Above NSW, Victoria & Tasmania**

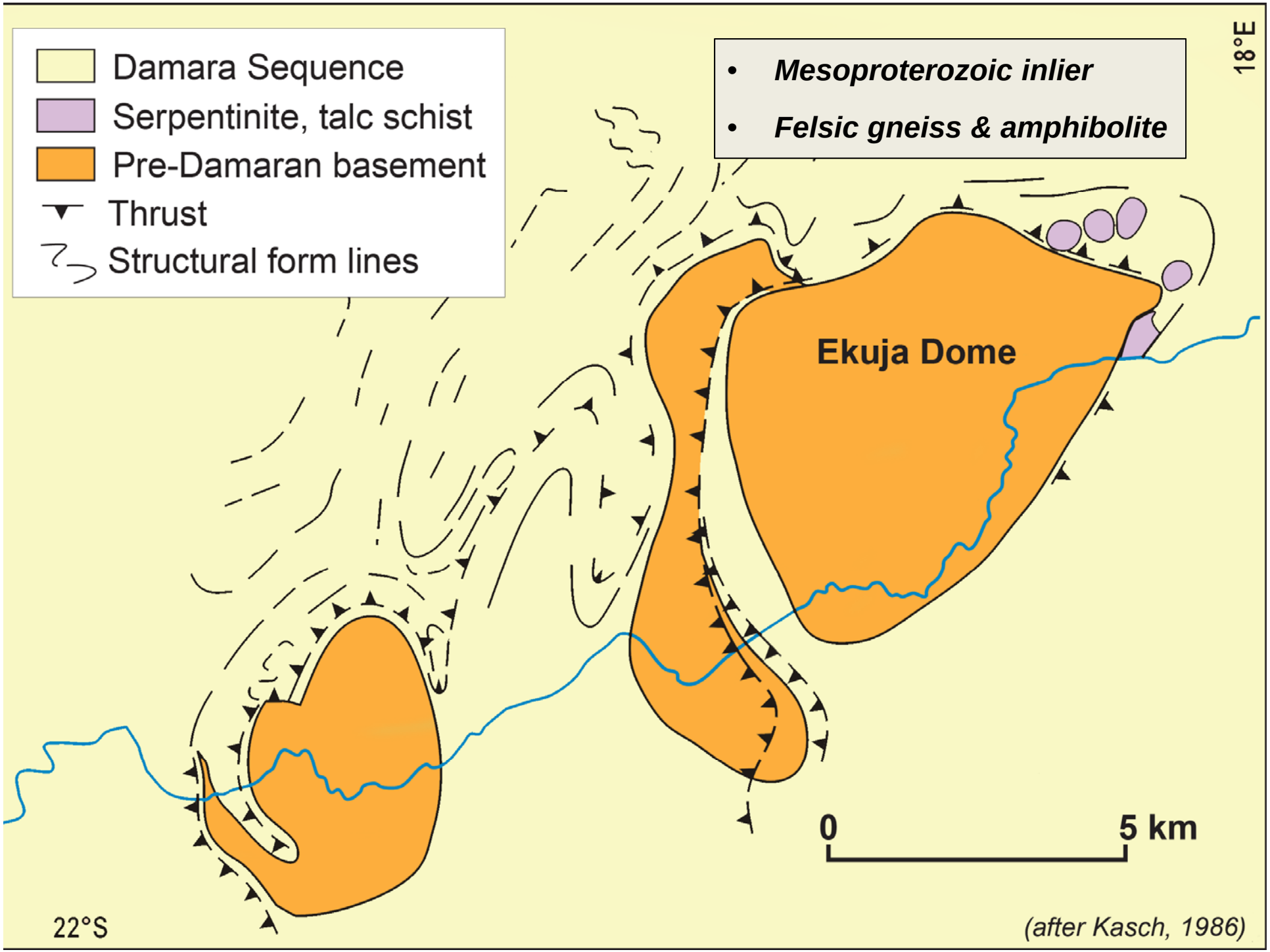

In summary, it’s a good place to look at rocks

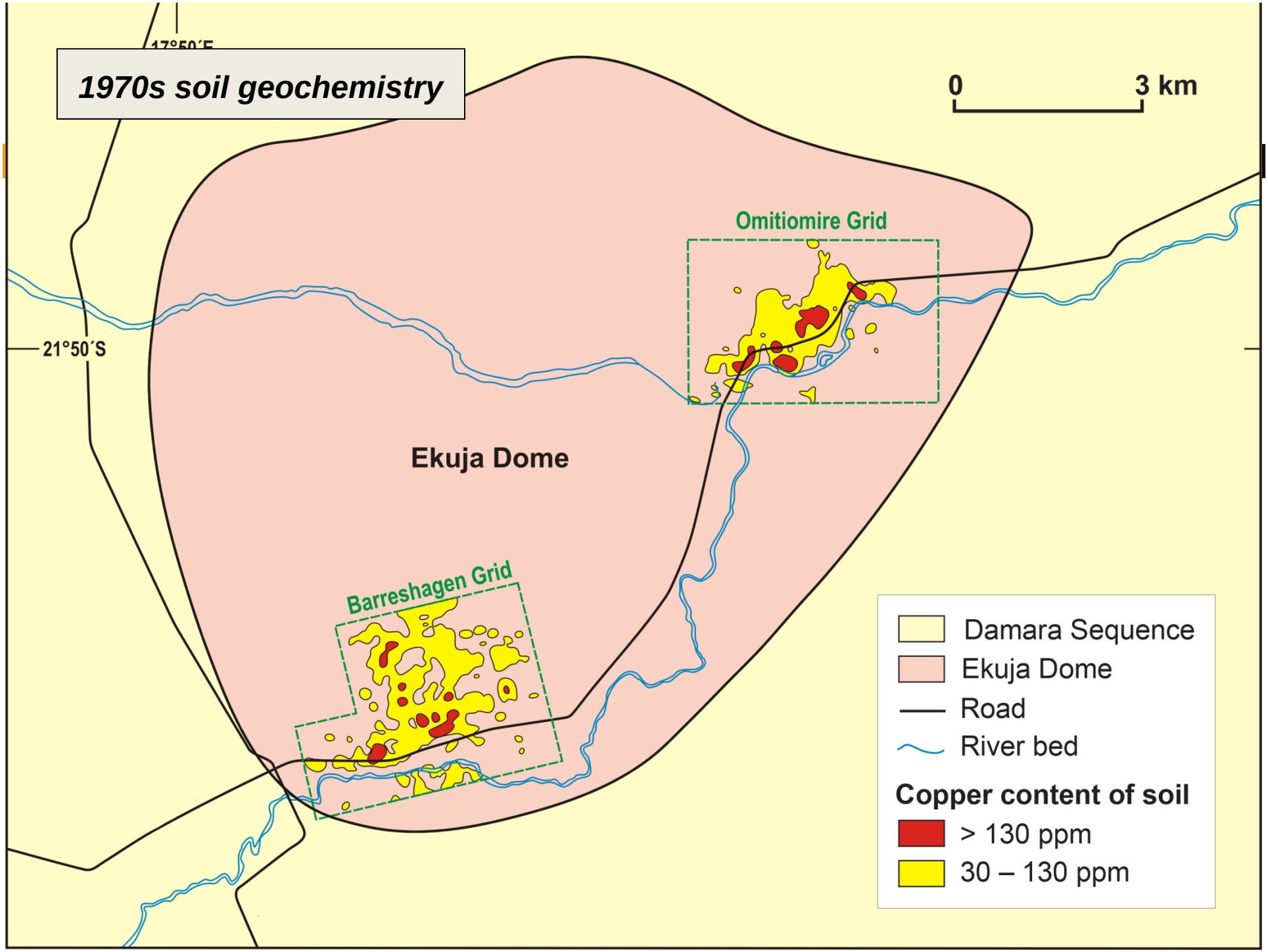
Omitiomire area

- ***Commercial farms - cattle & game animals***
- ***No villages***
- ***… and not much outcrop***



The only outcrop of the Omitiomire copper deposit


Damara Sequence
Serpentinite, talc schist
Pre-Damaran basement
Thrust
Structural form lines
• Mesoproterozoic inlier
• Felsic gneiss & amphibolite
Ekuja Dome
18°E
22°S
0
5 km
(after Kasch, 1986)


1970s soil geochemistry
0
3 km
Omitiomire Grid
21°50´S
Ekuja Dome
Barreshagen Grid
Damara Sequence
Ekuja Dome
Road
River bed
Copper content of soil
> 130 ppm
30 – 130 ppm

Previous drilling

GenMin 1970s: 3 holes → copper zone: 700m strike, 6 – 20m thick, 0.3 – 0.5% Cu

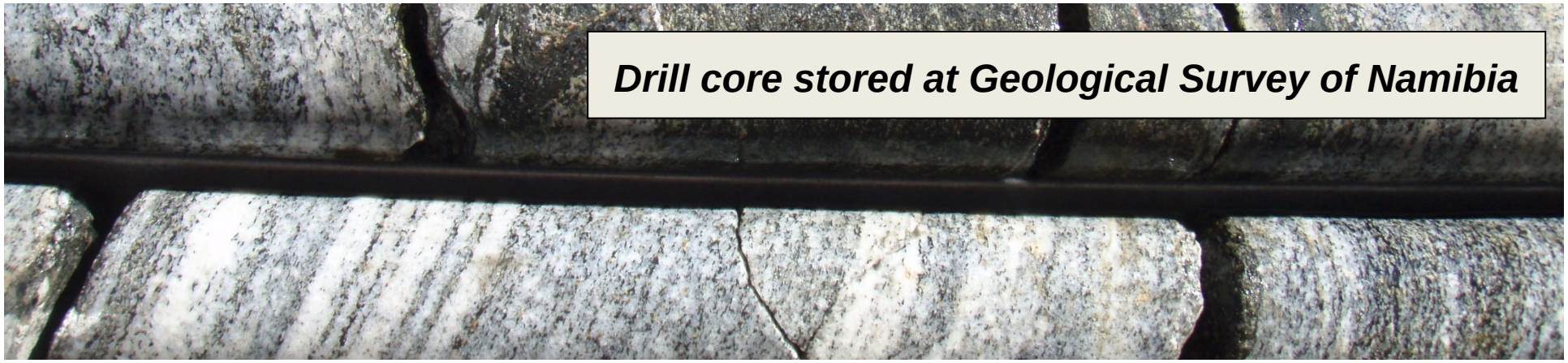
Nossob River Mining Company 1990s: 9 holes → copper zone 10 – 15m thick

Anglo American 1990s: 16 holes → copper zone 10 – 20m thick; area 600m x 700m

- **Hole OED5: 106m at 0.47% Cu**

Straits Resources 1998: 13 holes; best intersection 9m at 0.6% Cu

- **Potential for 20 Mt at 0.5% Cu at 0.2% Cu cut-off**



Resource estimate (Hellman, 1996)

- **Inferred Resource**

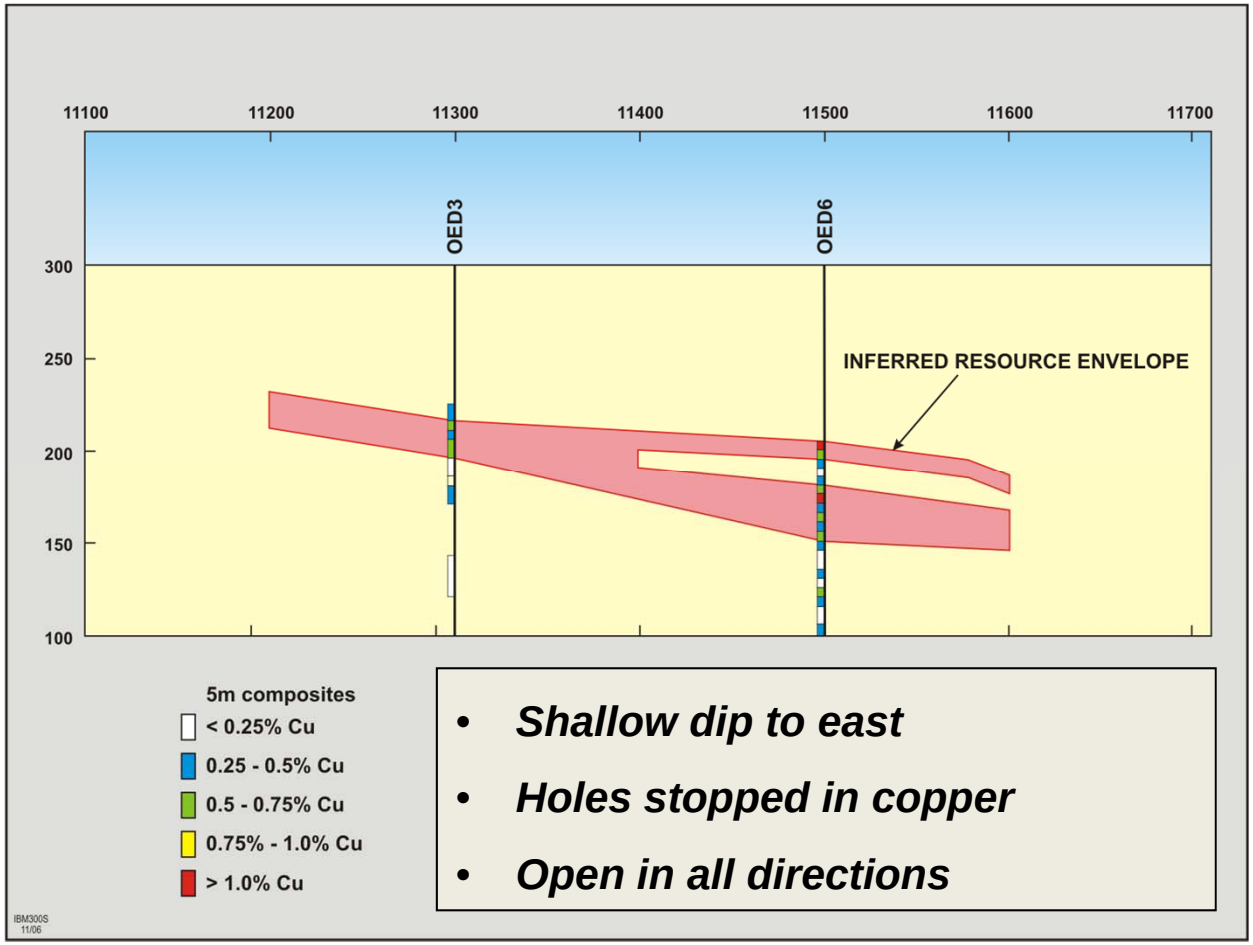
  7.9 Mt at 0.9% Cu

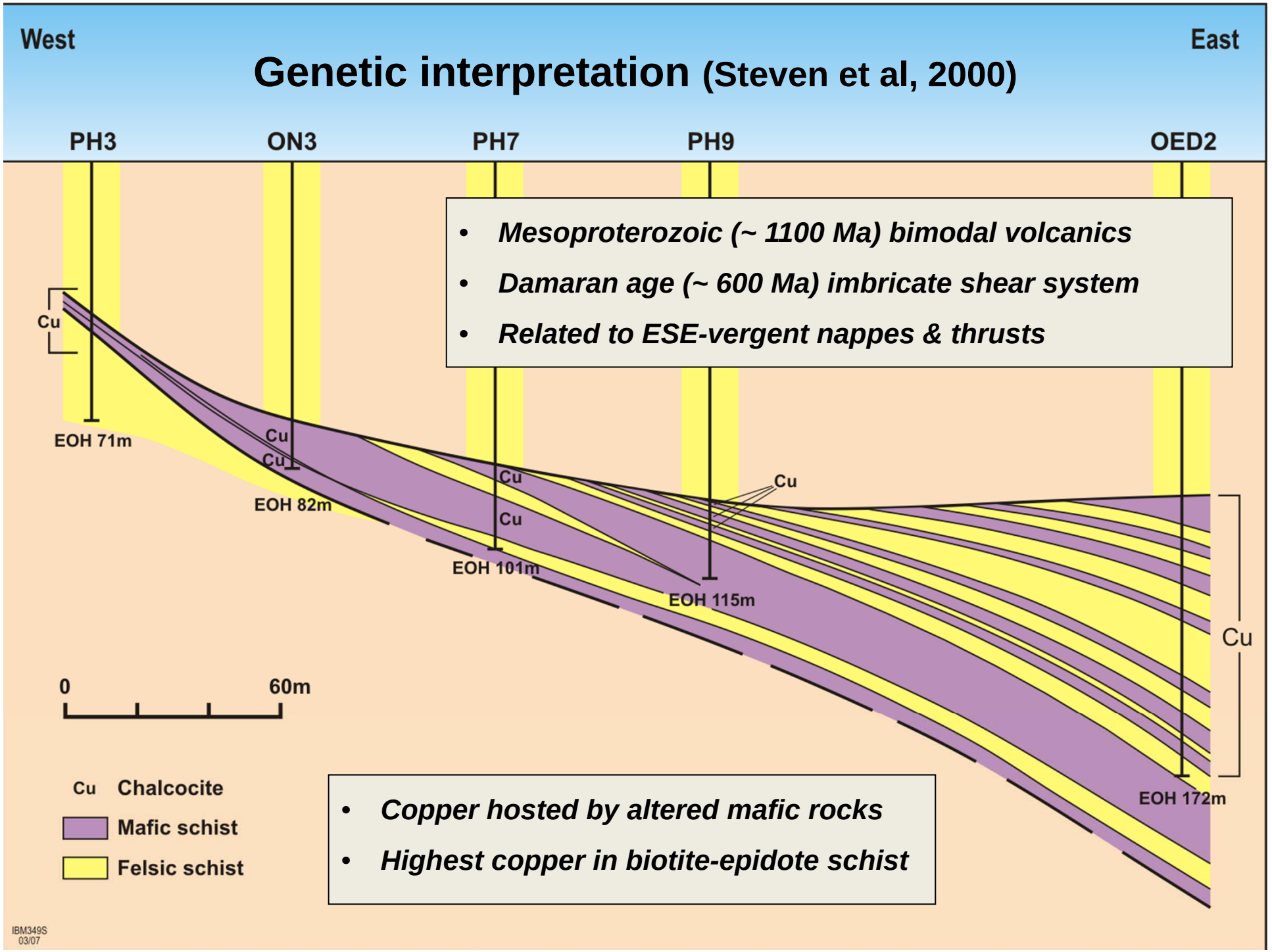
  (0.5% Cu cut-off)

- **Resource potential**

  30 Mt at 0.7% Cu

  within drilled area




West
East
Genetic interpretation (Steven et al, 2000)
PH3
ON3
PH7
PH9
OED2
• Mesoproterozoic (~ 1100 Ma) bimodal volcanics
• Damaran age (~ 600 Ma) imbricate shear system
• Related to ESE-vergent nappes & thrusts
Cu
EOH 71m
Cu
Cu
EOH 82m
Cu
Cu
EOH 101m
Cu
EOH 115m
Cu
EOH 172m
0
60m
Cu Chalcocite
Mafic schist
Felsic schist
• Copper hosted by altered mafic rocks
• Highest copper in biotite-epidote schist
IBM349S
03/07

Manica Minerals

- **2005: Interpreted regional geophysical data**
- **2006: Applied for five EPLs**
- **2008: JV with IBML**

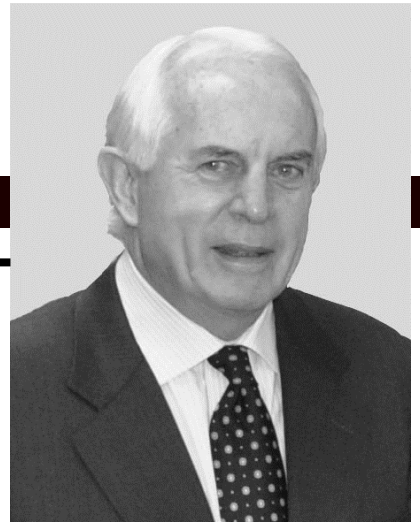
Exclusive Prospecting Licence (EPL)

- ***Three-year licence***
- ***Areas up to 1,000 km²***
- ***Annual expenditure & reporting commitments***
- ***May be renewed twice for two-year periods***
- ***Further renewals require ministerial consent***

IBML - Getting started in Namibia

Money Money Money

Funding



Alan Humphris

Chen Qiang

Zheng Fuhu

Dr Deng Jiniu

West Minerals Pty Ltd

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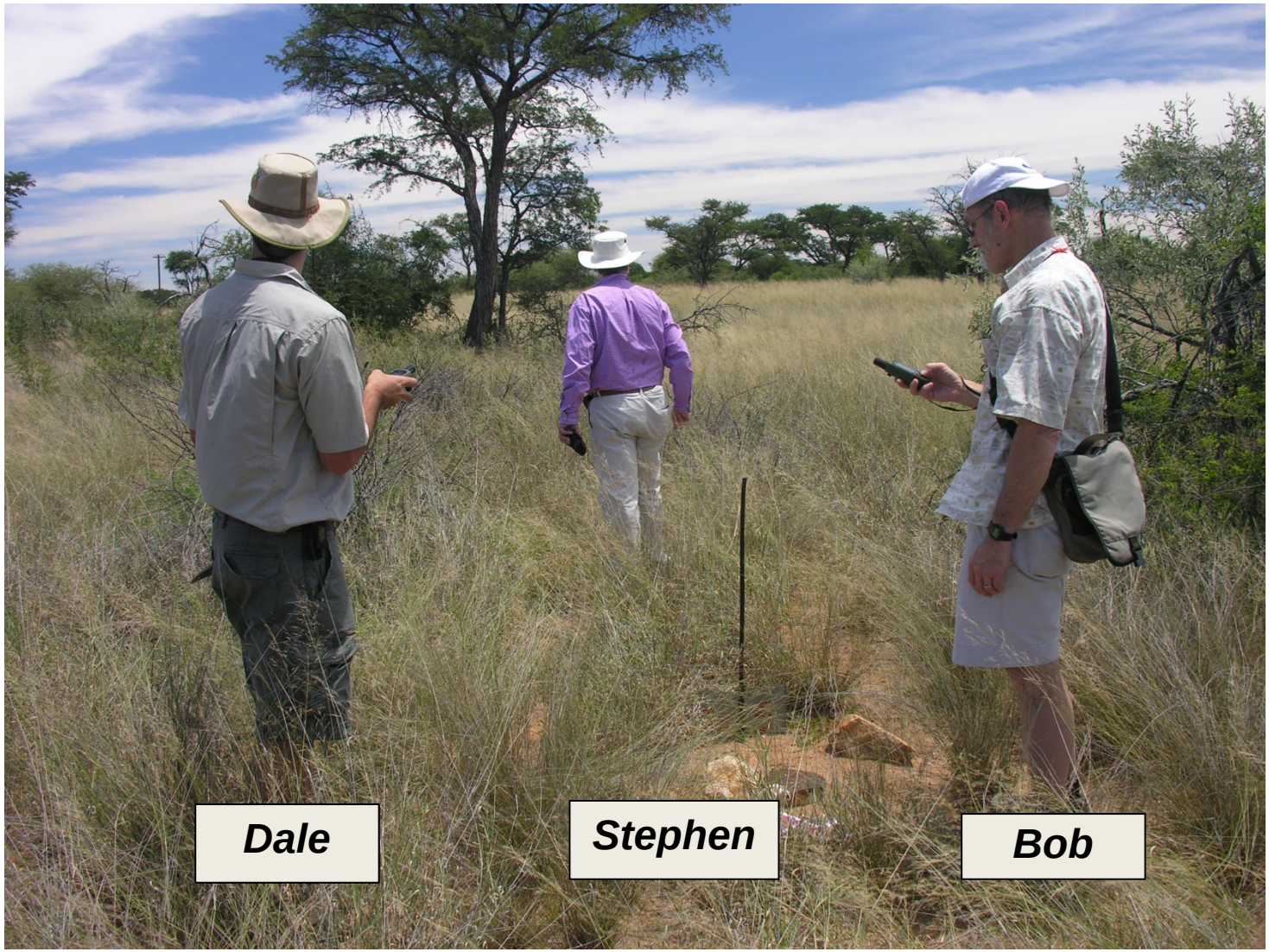
IBML

Registered in Namibia

Craton Mining & Exploration (Pty) Ltd

Where are those drill holes ? (Feb 2007)



Project assessment, Feb 2007

- **Potential for 30 Mt at 0.7% Cu**
- **Mainly chalcocite**
- **No carbonate → Potential SX-EW operation**
- **Potential for other deposits in the Ekuja Dome**

Establishing a team

Karl Hartmann - Exploration Manager

Ken Hart - Senior Geologist

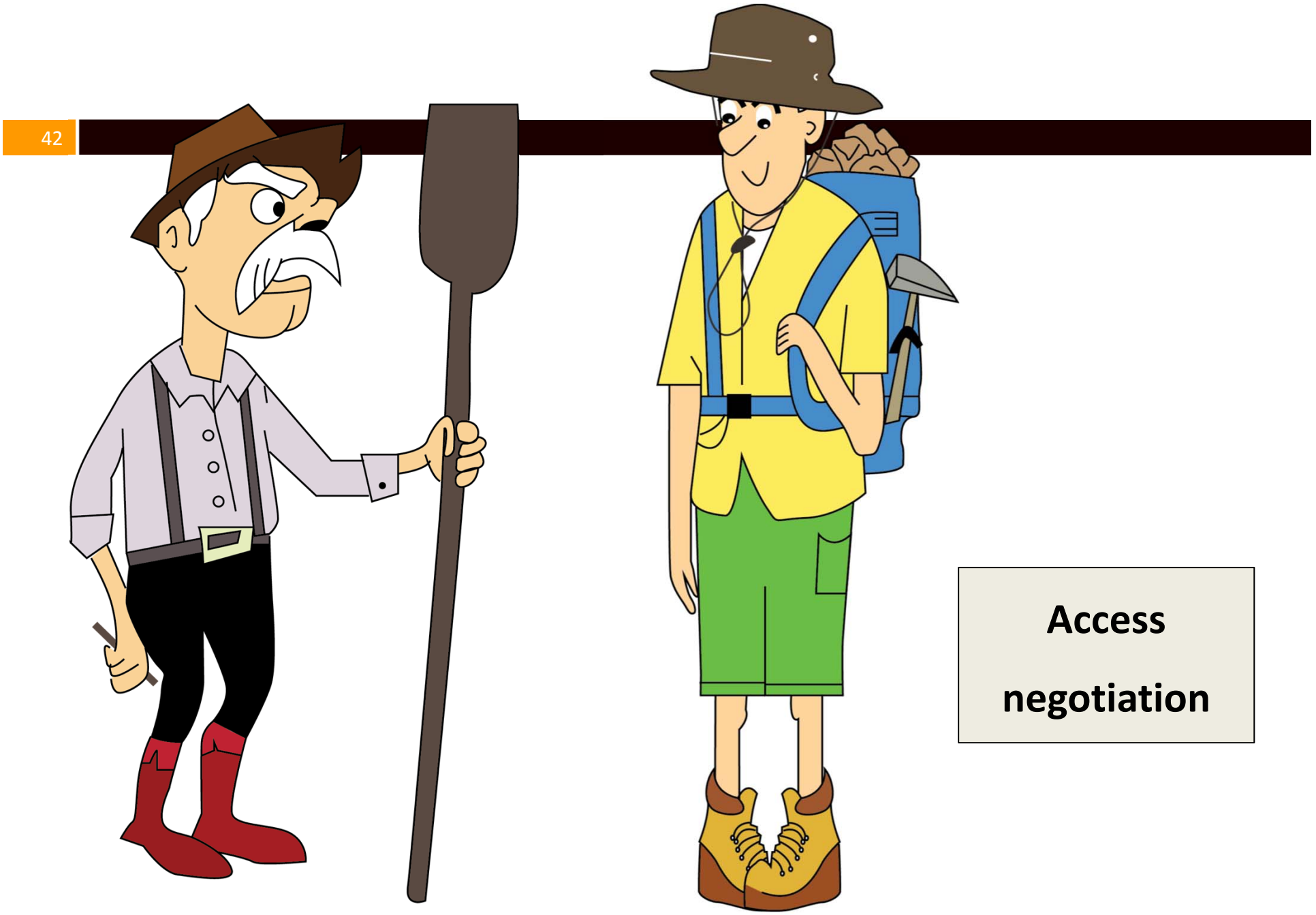
Simon Brodie - Database Manager

Ziggy Hartmann - Admin Manager

Desmond Schnugh - Logistics

Exploration objectives for 2007

- **Target: Inferred Resource 15 Mt at 0.7% Cu**
- **Scope the likely eventual size of the Omitiomire deposit**
- **Assess technical & financial parameters**
- **Assess other targets**



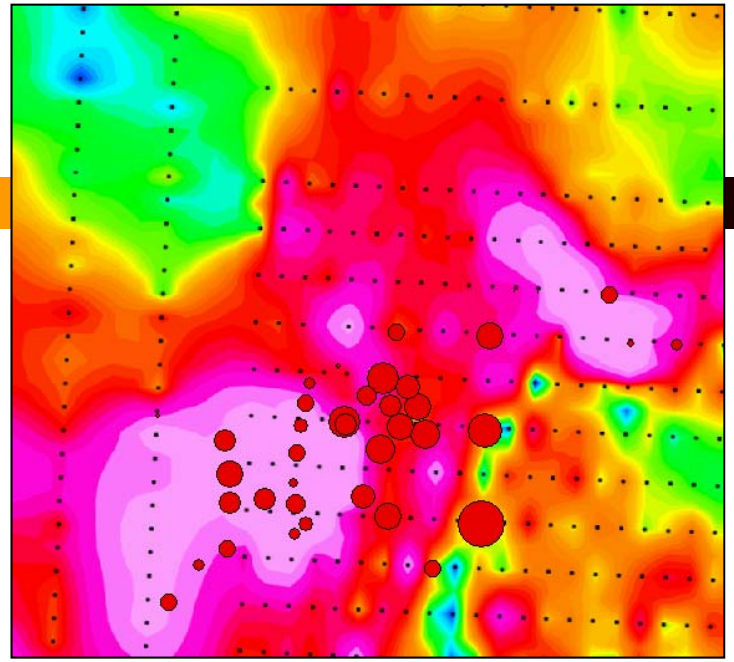
Access negotiation

Not always friendly

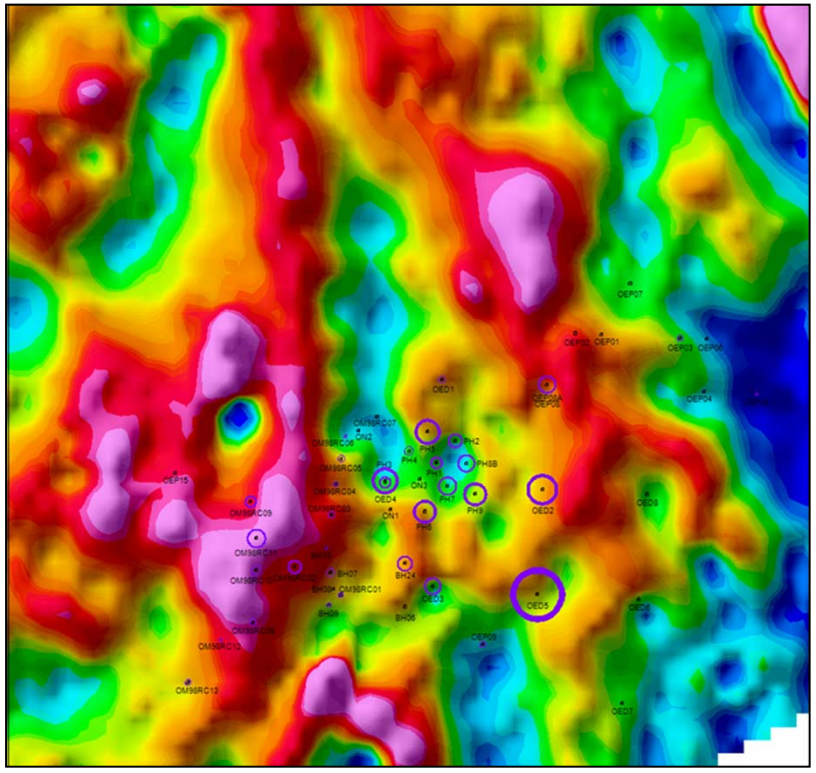

Field camp
August 2007

Field team

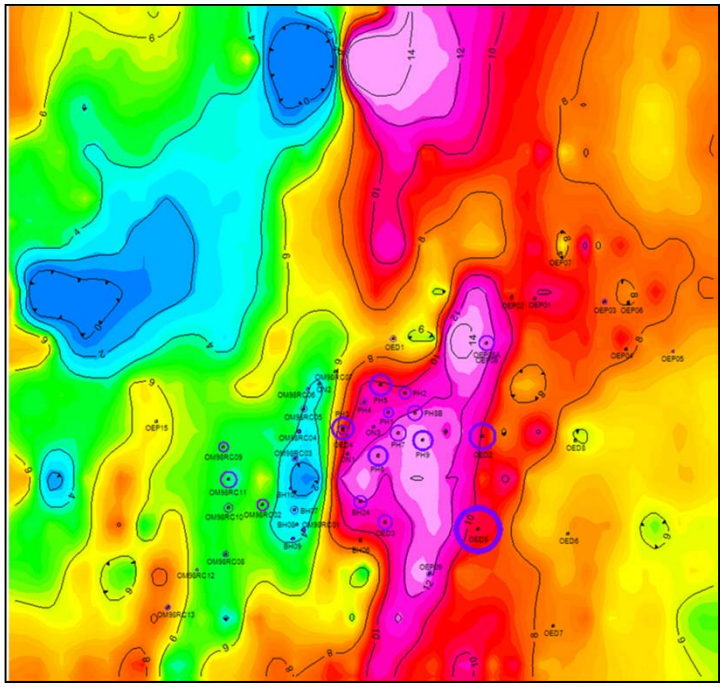
Namibian cell phone tower



Review of soil geochemistry



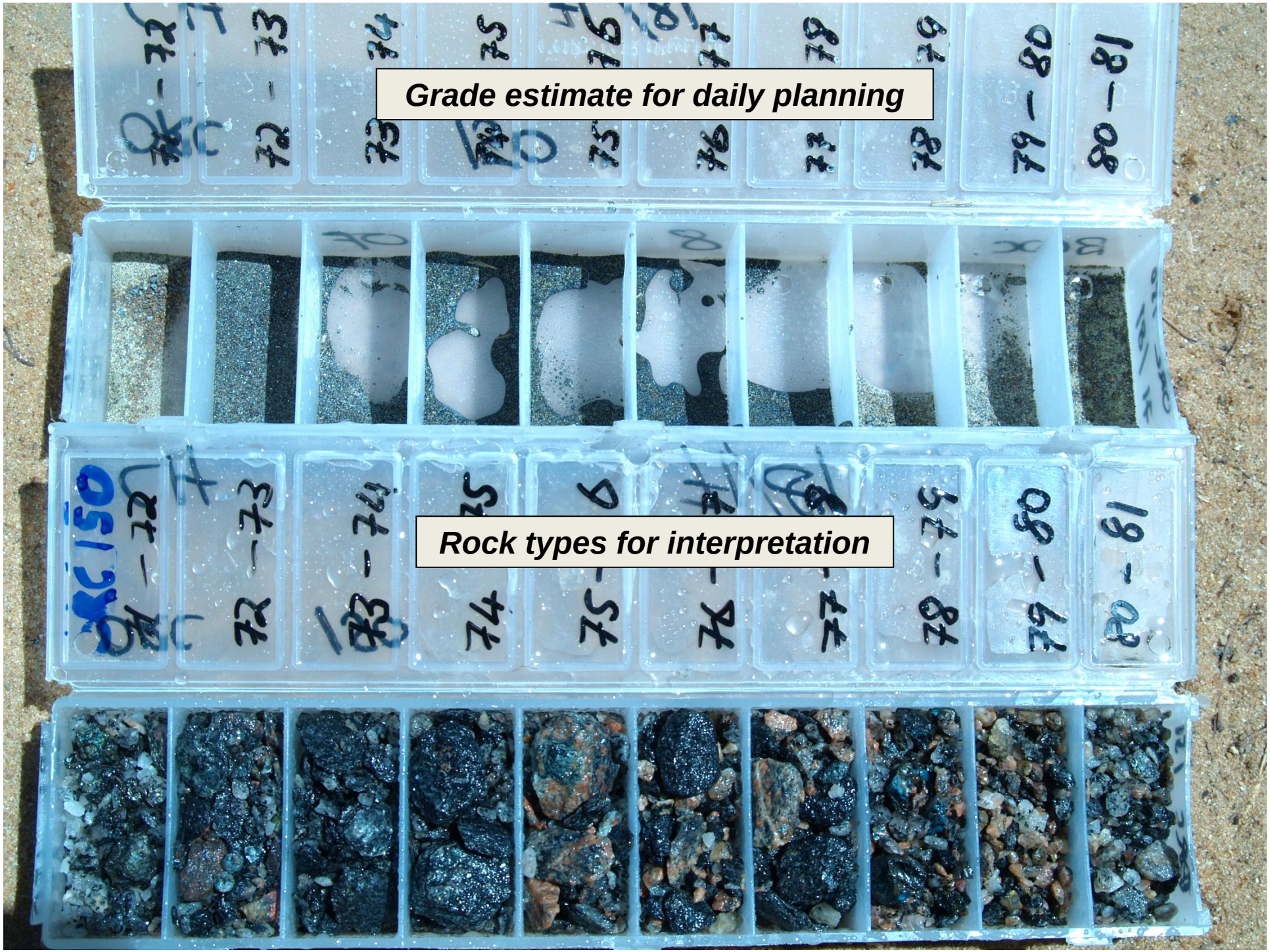
Ground magnetic survey



I.P. survey

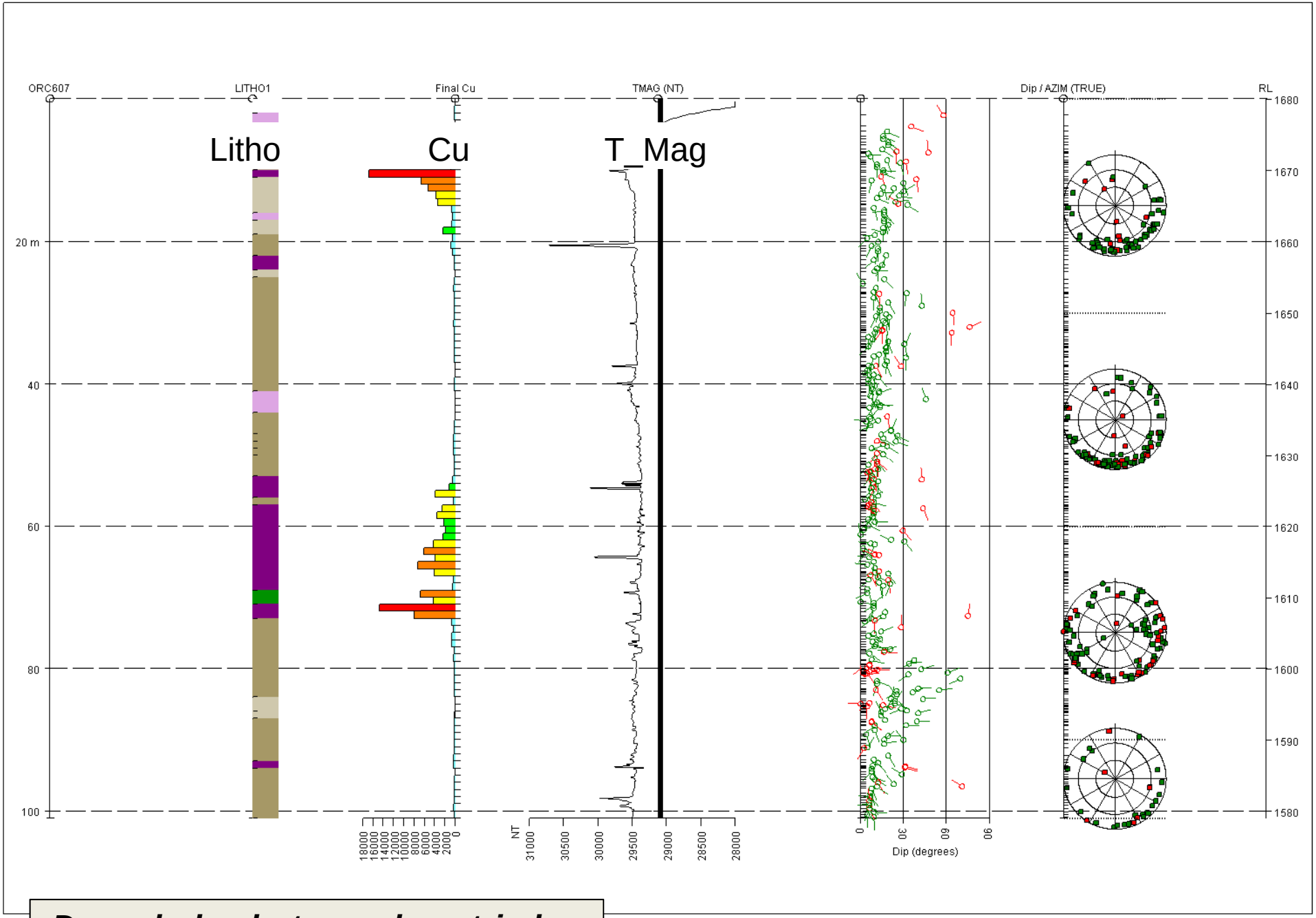

First drill hole,
August 2007
SCHRAMM
OYOTA


RC drilling


Grade estimate for daily planning
Rock types for interpretation

Downhole photography

Provides structural information



Down-hole photography: strip log

Diamond drilling

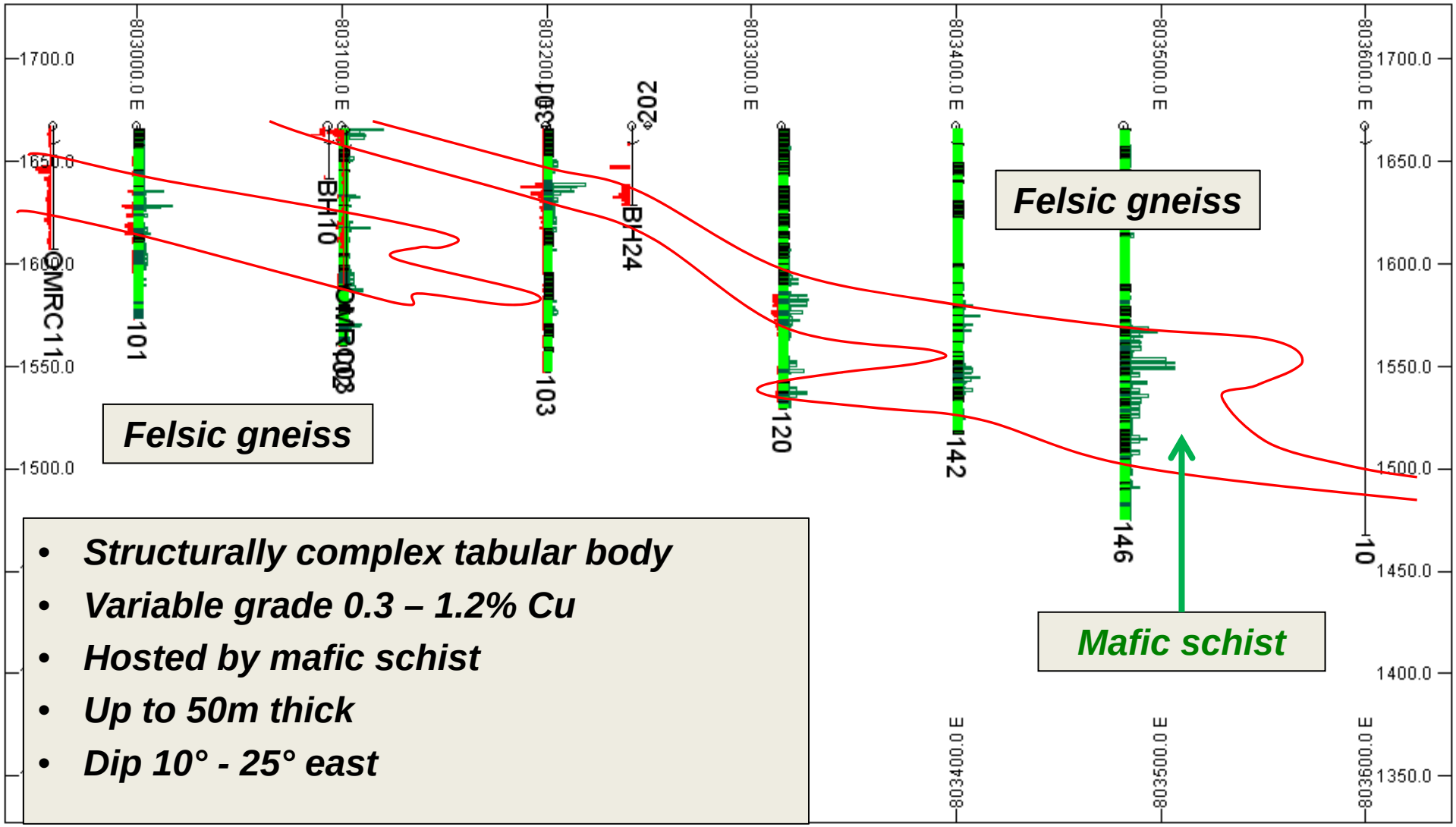
Team training

The copper zone

Disseminated chalcocite in biotite - hornblende - plagioclase schist

Studying drill core

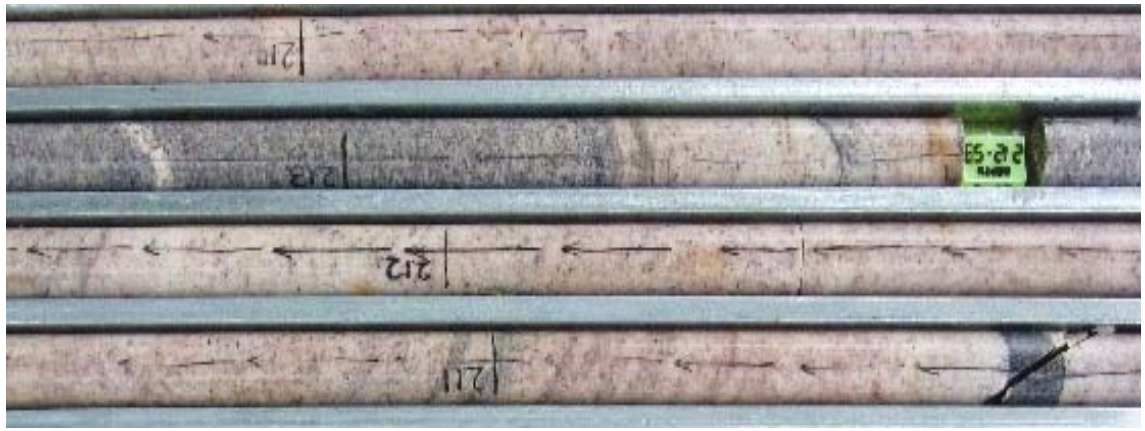
Geological section, Nov 2007



Geology

Hanging wall:

barren felsic gneiss

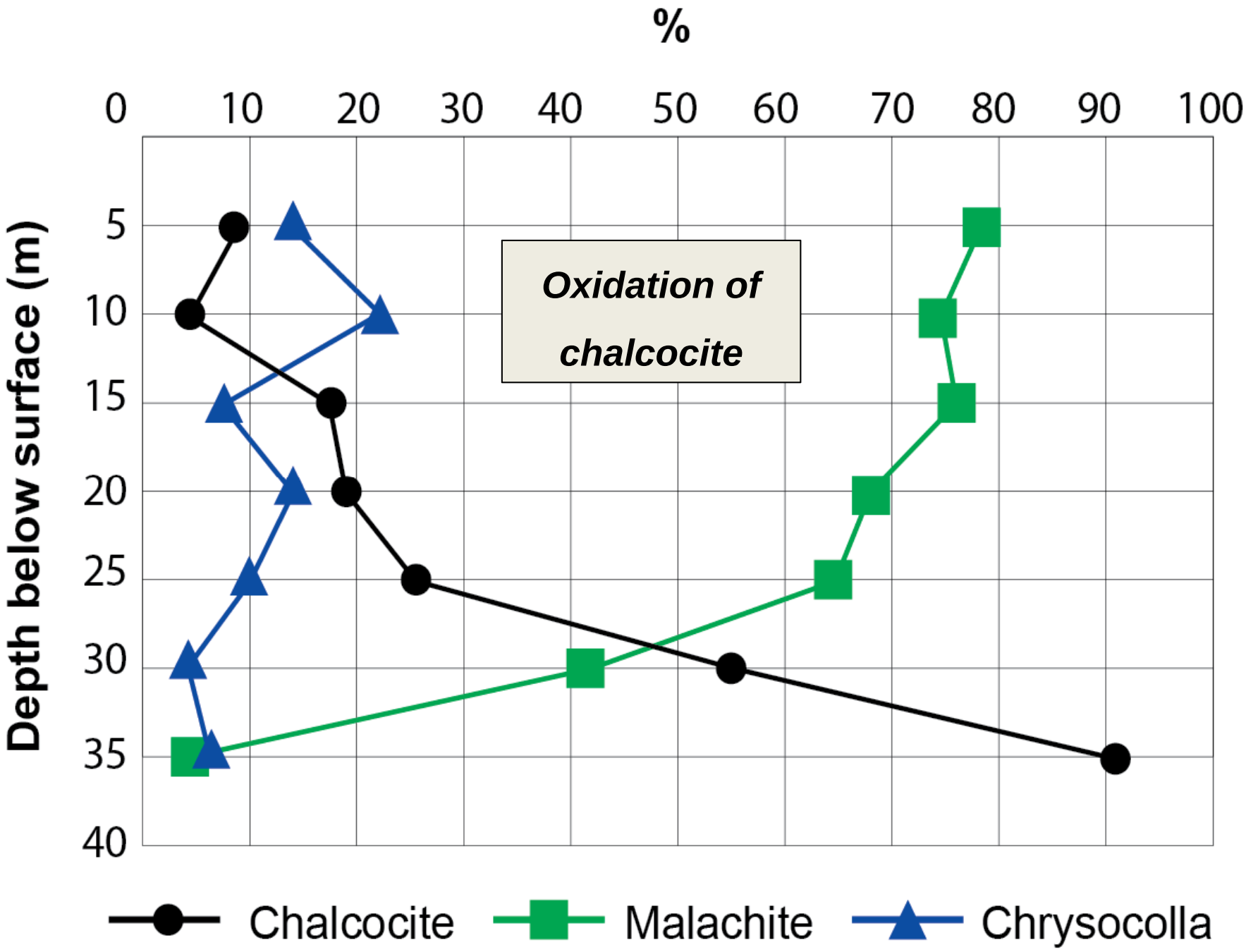


Ore zone: mafic schist

Mineralogy

- **Chalcocite** Cu_2S **~ 90%**
- **Bornite** Cu_5FeS_4 **~ 8%**
- **Chalcopyrite** $CuFeS_2$ **trace**
- **No iron sulphide**
- **No Zambian-type mineral zoning**
- **Minor magnetite**
- **Minor hematite**

Chalcocite (shiny grey mineral) in drill core


%
0
10
20
30
40
50
60
70
80
90
100
Depth below surface (m)
5
10
15
20
25
30
35
40
Oxidation of chalcocite
Chalcocite
Malachite
Chrysocolla

Malachite (green) and chrysocolla (blue-green)

Corporate objectives 2008

- **Identify a resource of 400,000 tonnes of contained copper**
- **Produce a prospectus for an ASX listing in late 2008**
- **Raise A$30 million at Initial Public Offering (IPO)**
- **Initiate a bankable feasibility study**

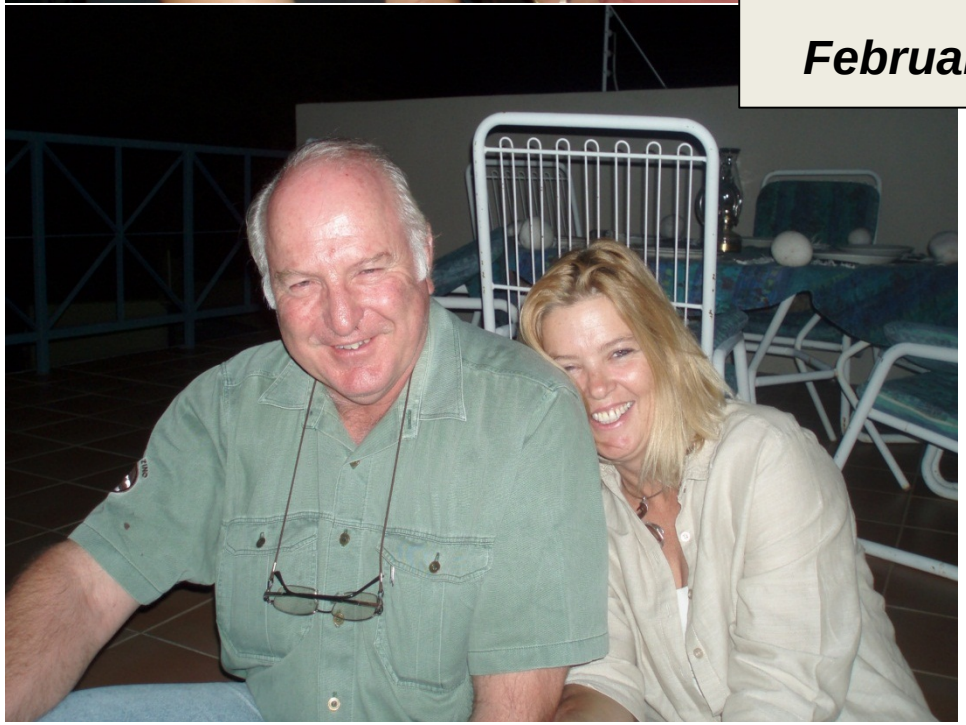
2008 - Heading towards an IPO

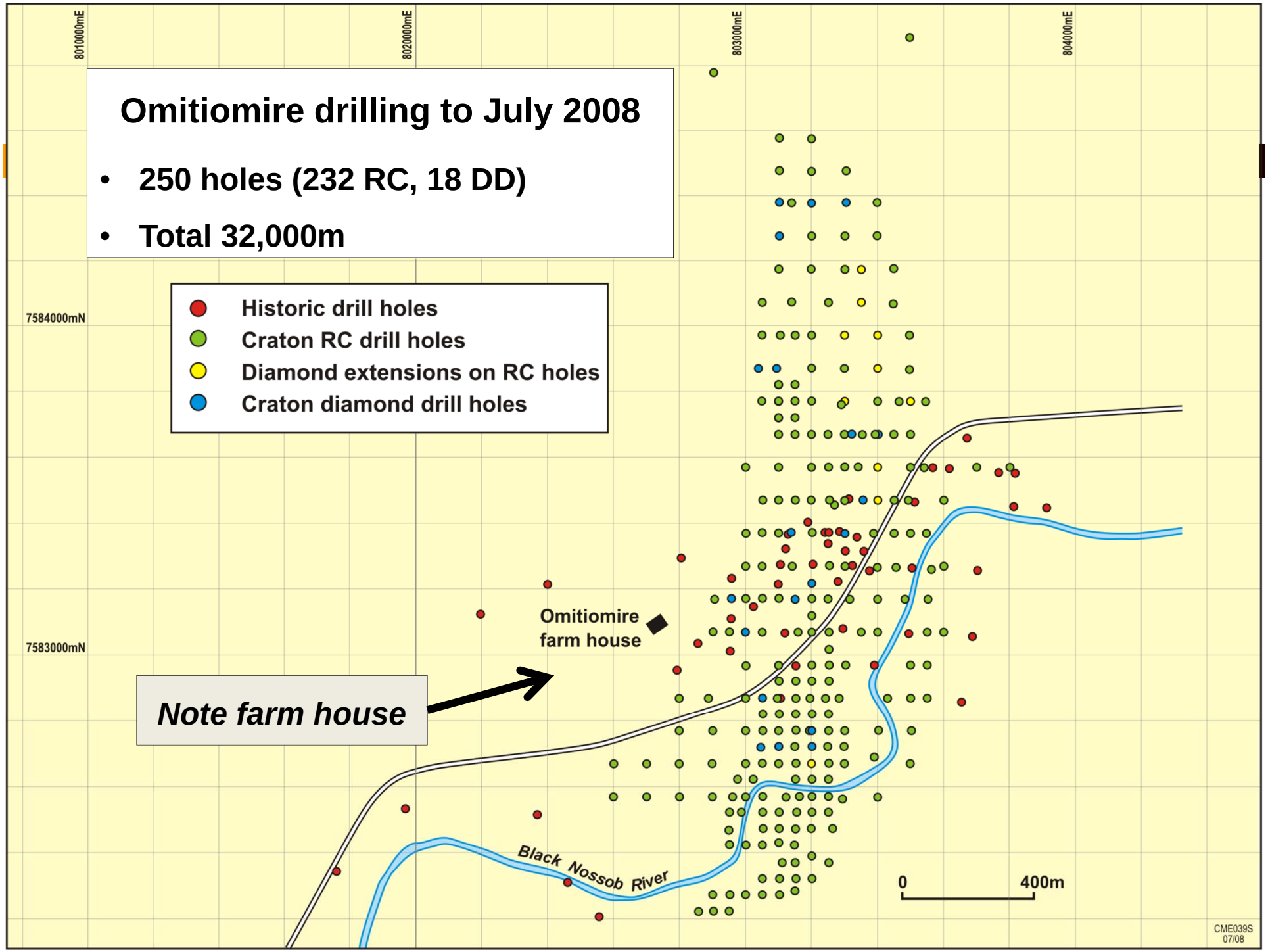
Lots of drilling


Delayed by rain

Staff party

February 2008



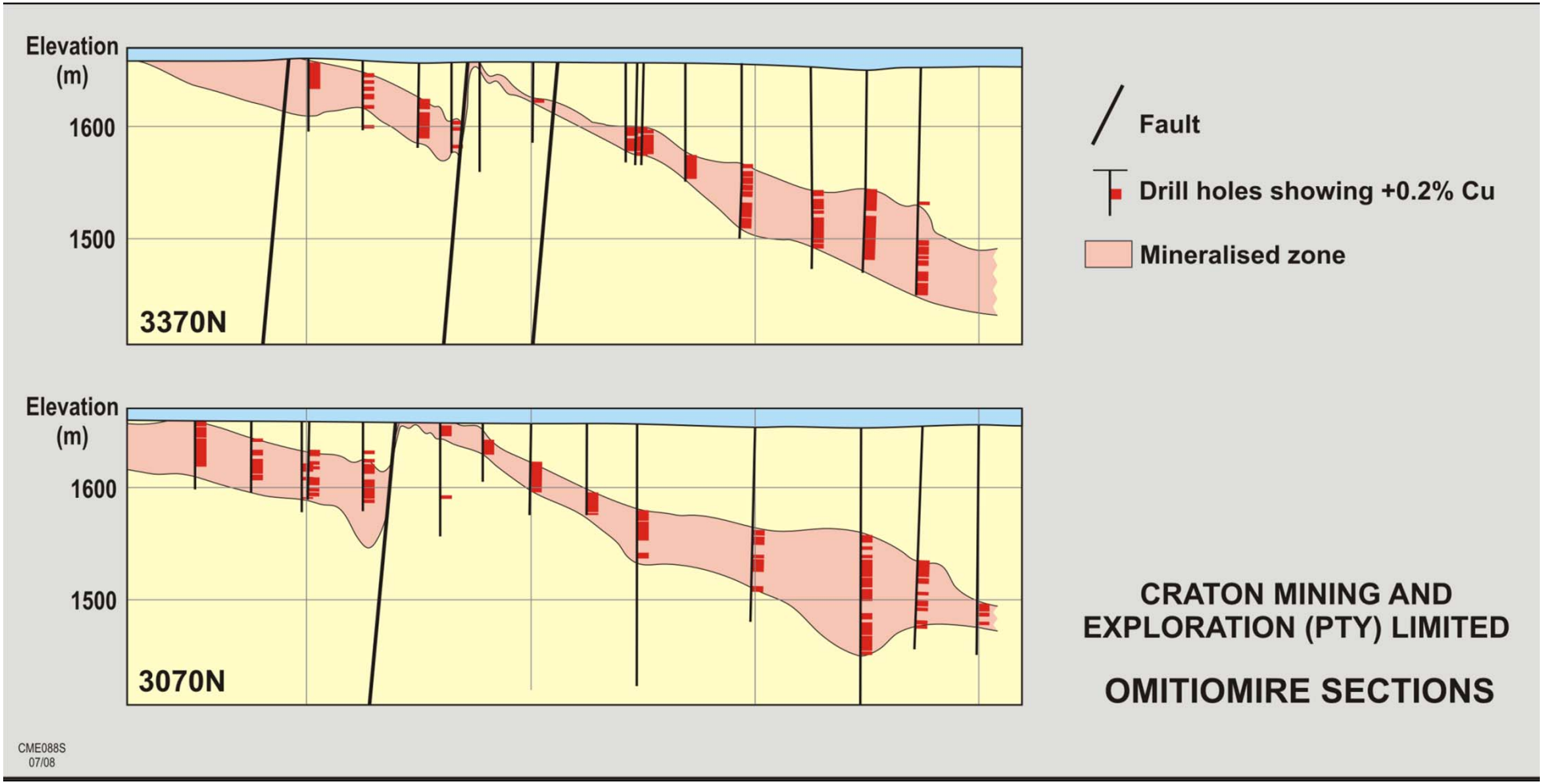

Omitiomire drilling to July 2008
• 250 holes (232 RC, 18 DD)
• Total 32,000m
Historic drill holes
Craton RC drill holes
Diamond extensions on RC holes
Craton diamond drill holes
8010000mE
8020000mE
8030000mE
8040000mE
7584000mN
7583000mN
Omitiomire
farm house
Note farm house
Black Nossob River
0
400m
CME039S
07/08

Cover your drill holes

And no drilling on Sundays

O.K. we've covered the holes

Structural interpretation 2008



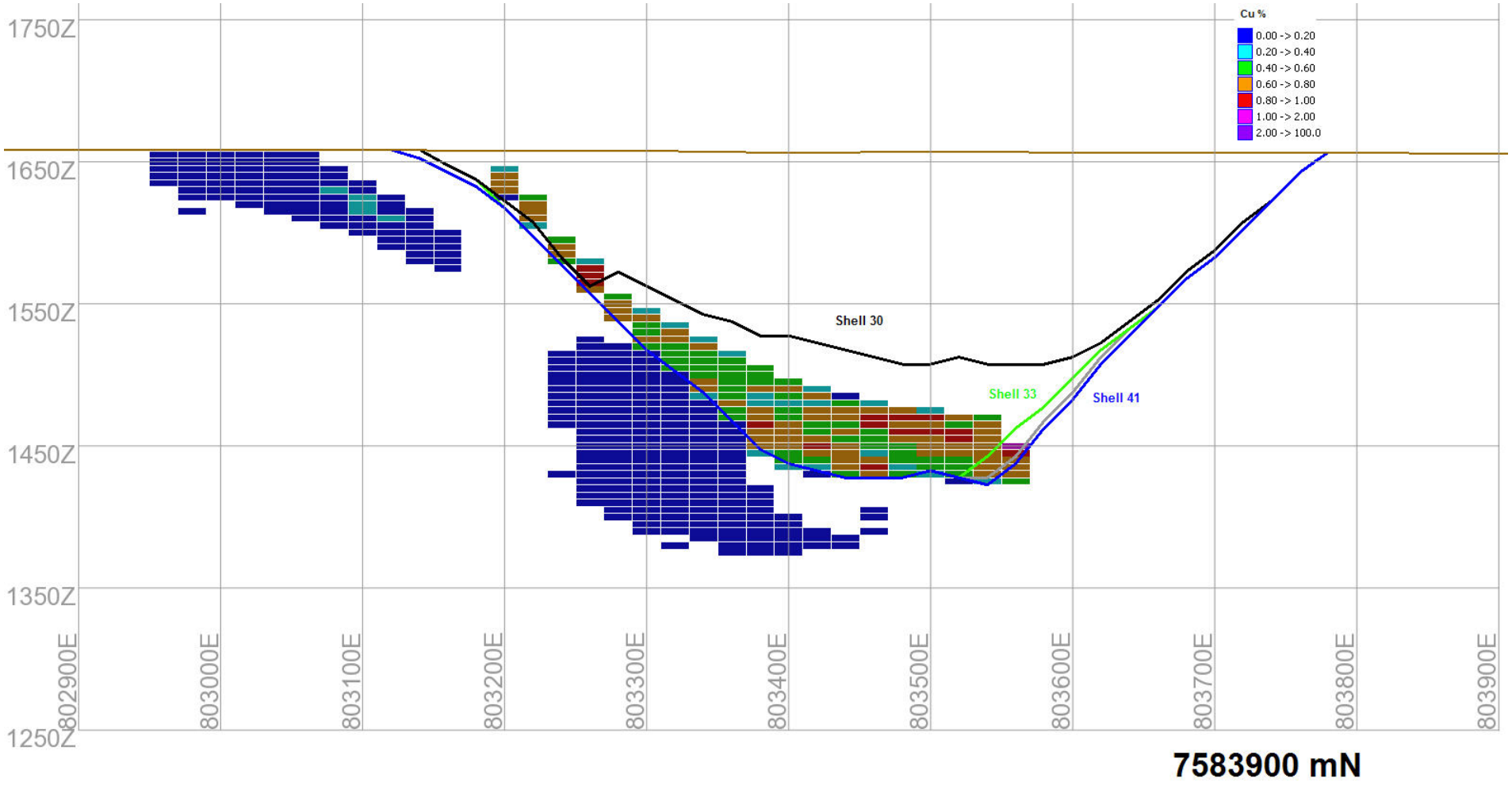
Resource August 2008

98 Mt at 0.51% Cu at 0.25% Cu cut-off

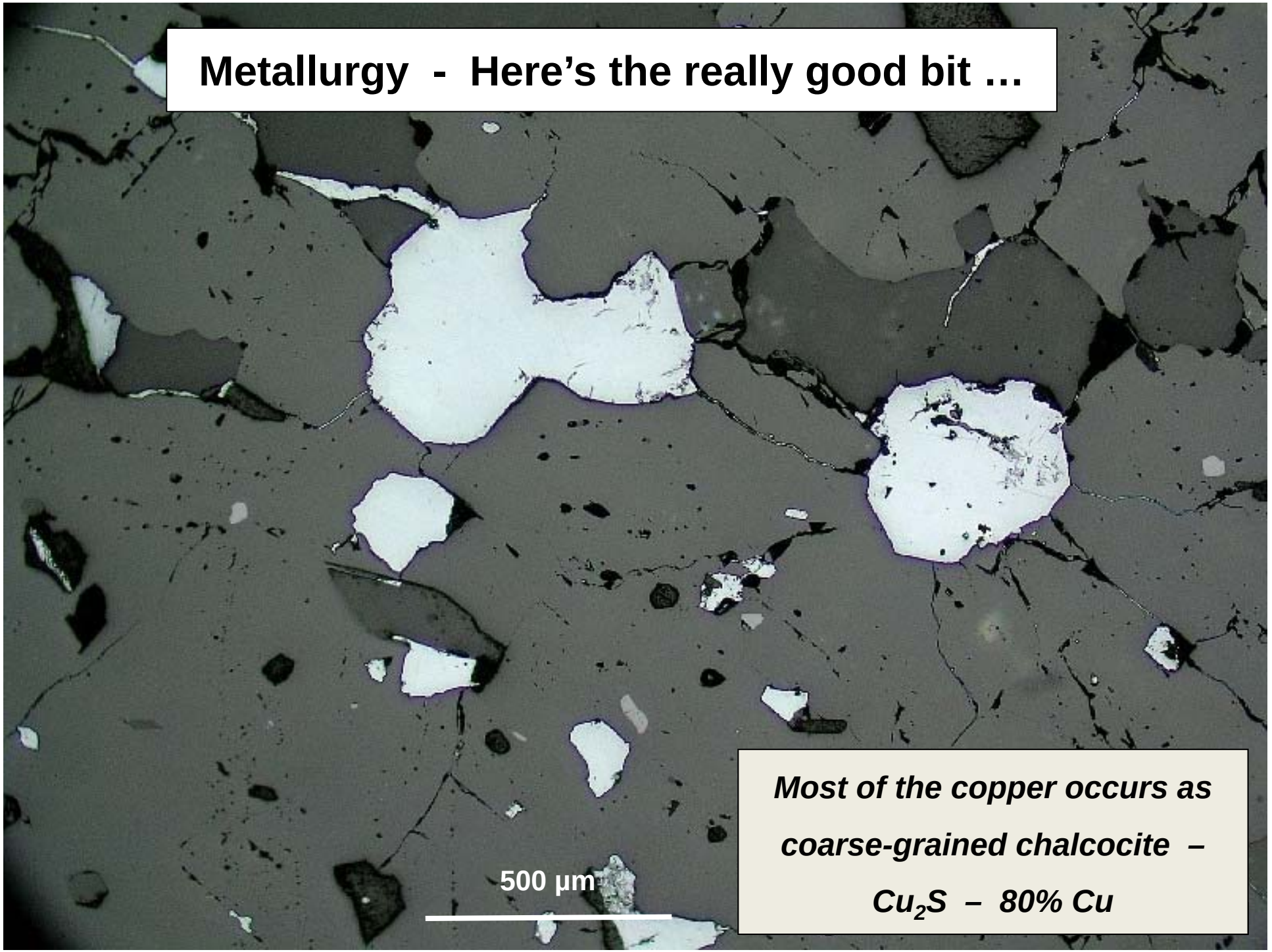
(500,000 tonnes contained copper)

(17% Indicated, remainder Inferred)

Preliminary mine planning



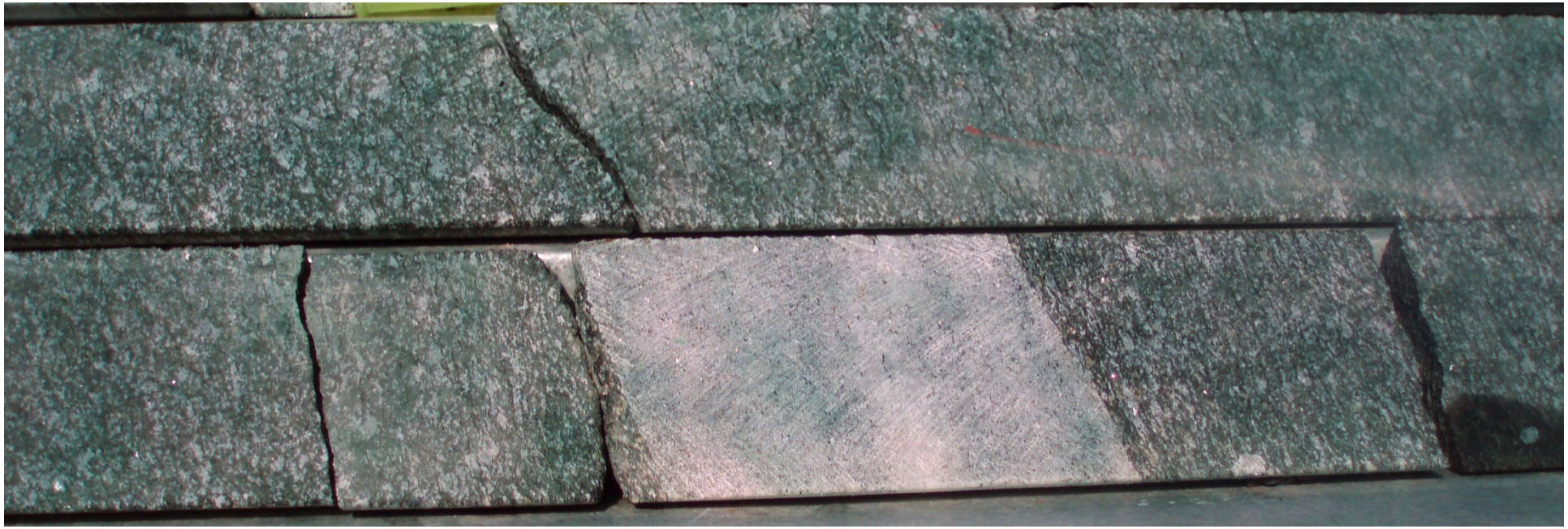
Metallurgy - Here's the really good bit …



Most of the copper occurs as coarse-grained chalcocite – Cu_2S – 80% Cu

Style of deposit

- The ore is banded
- Copper is hosted in bands of mafic schist
- Bands of felsic gneiss are barren



Proposed sulphide copper pre-concentration

- **Copper-bearing mafic schist is soft & heavy (> 2.8 g/cm^3)**
- **Barren felsic gneiss is hard & light (< 2.7 g/cm^3)**

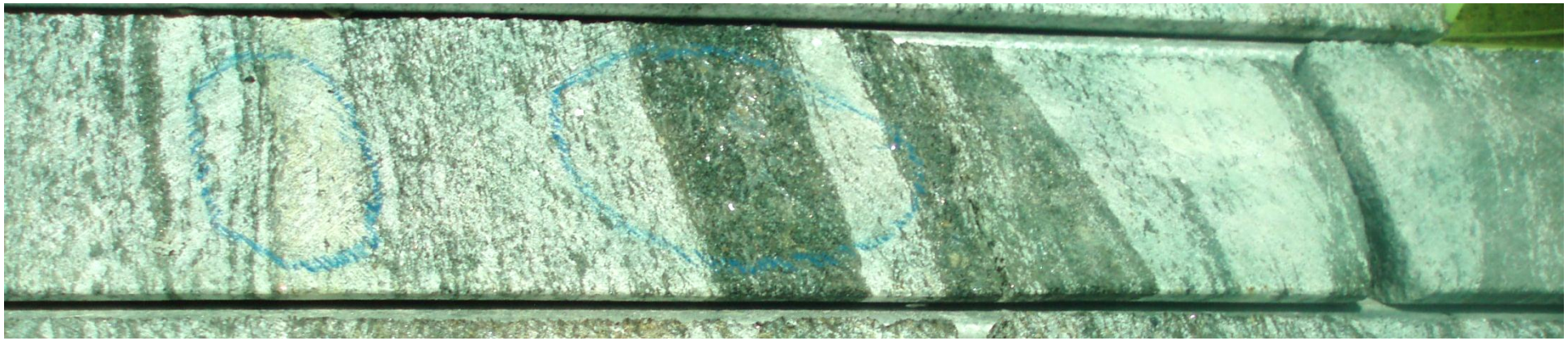
→ **Effective pre-concentration by dense medium separation (DMS)**

DMS doubles the grade of mill feed to ~ 1% Cu

Metallurgical testwork

Expected process outcomes -

- **Dense medium separation of crushed ore (at 2.7 g/cc):**
  - **Doubles run-of-mine grade at 95% copper recovery**
- **Flotation of sulphide ore**
  - **Concentrate grade exceeds 50% Cu at 95% recovery**



Preparation for an IPO

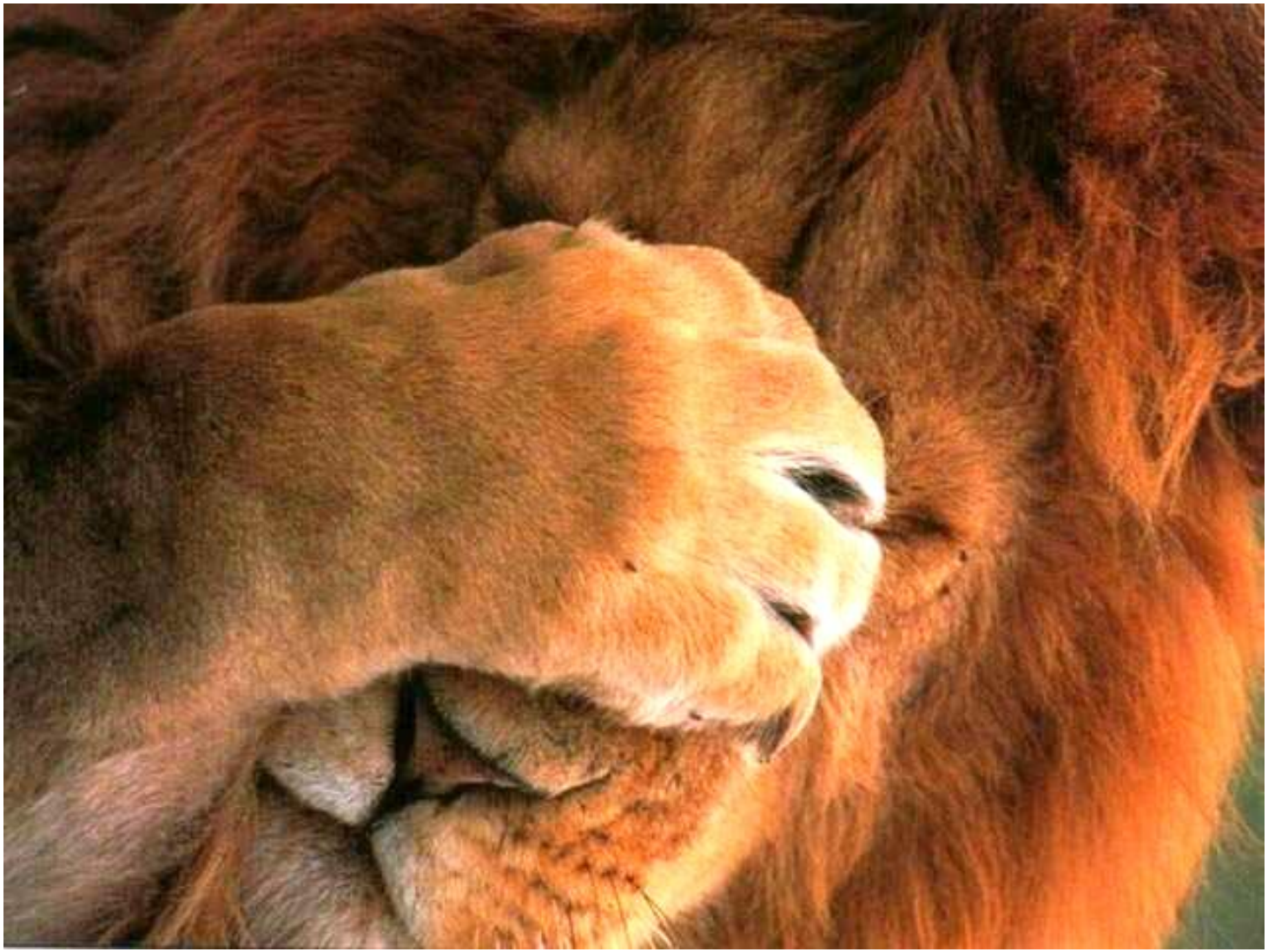
- **Scoping study completed**
- **Independent geological report & valuation completed**
- **Investigating accountant's report completed**
- **Prospectus prepared**
- **Two new non-executive directors appointed (Sept 2008)**
  - **James Macdonald - geologist (Chairman)**
  - **Peter Bradford - metallurgist**

It looks like we're on a winner !!

Storm clouds gathering

Global financial crisis

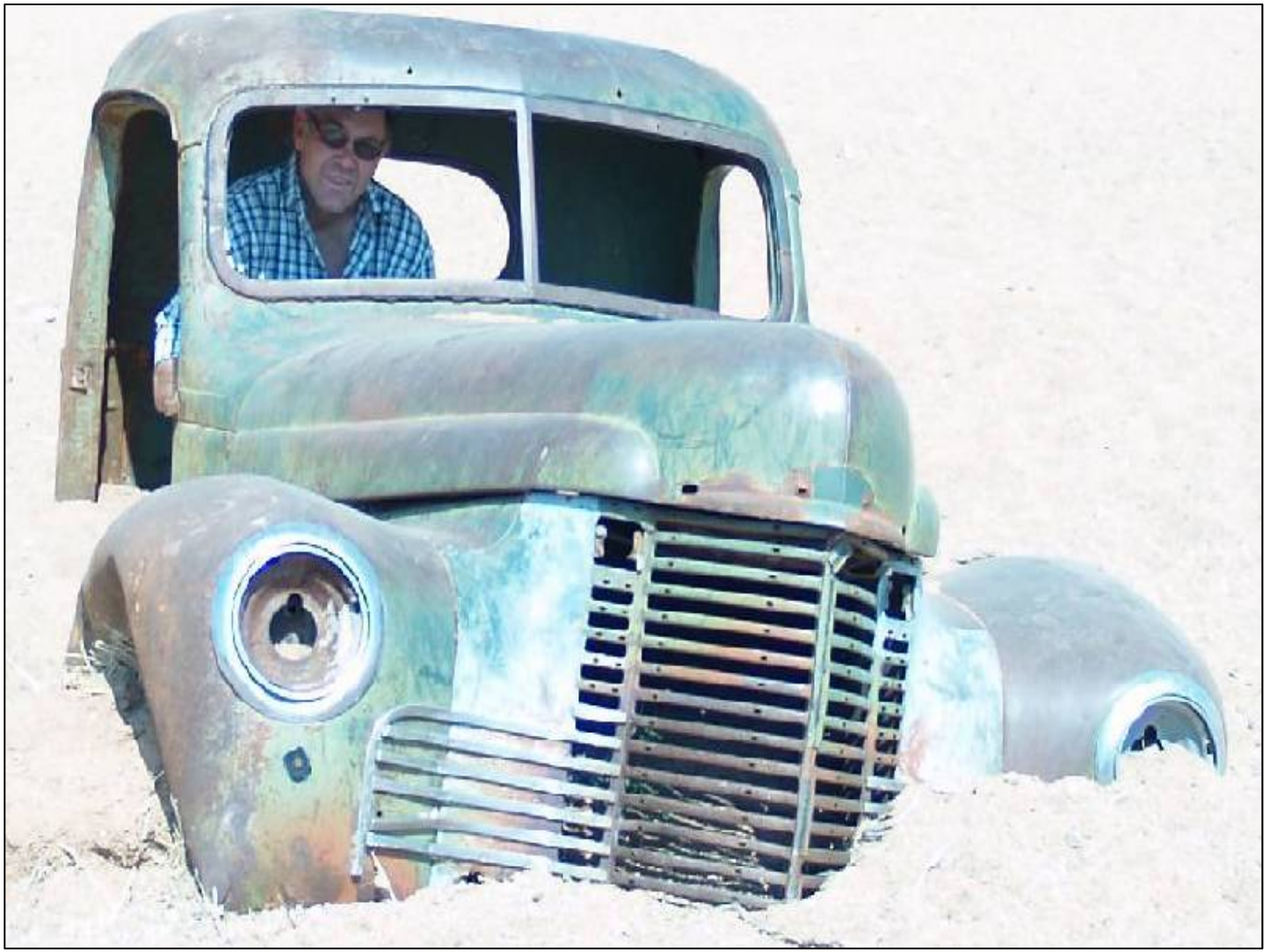
Doom & gloom



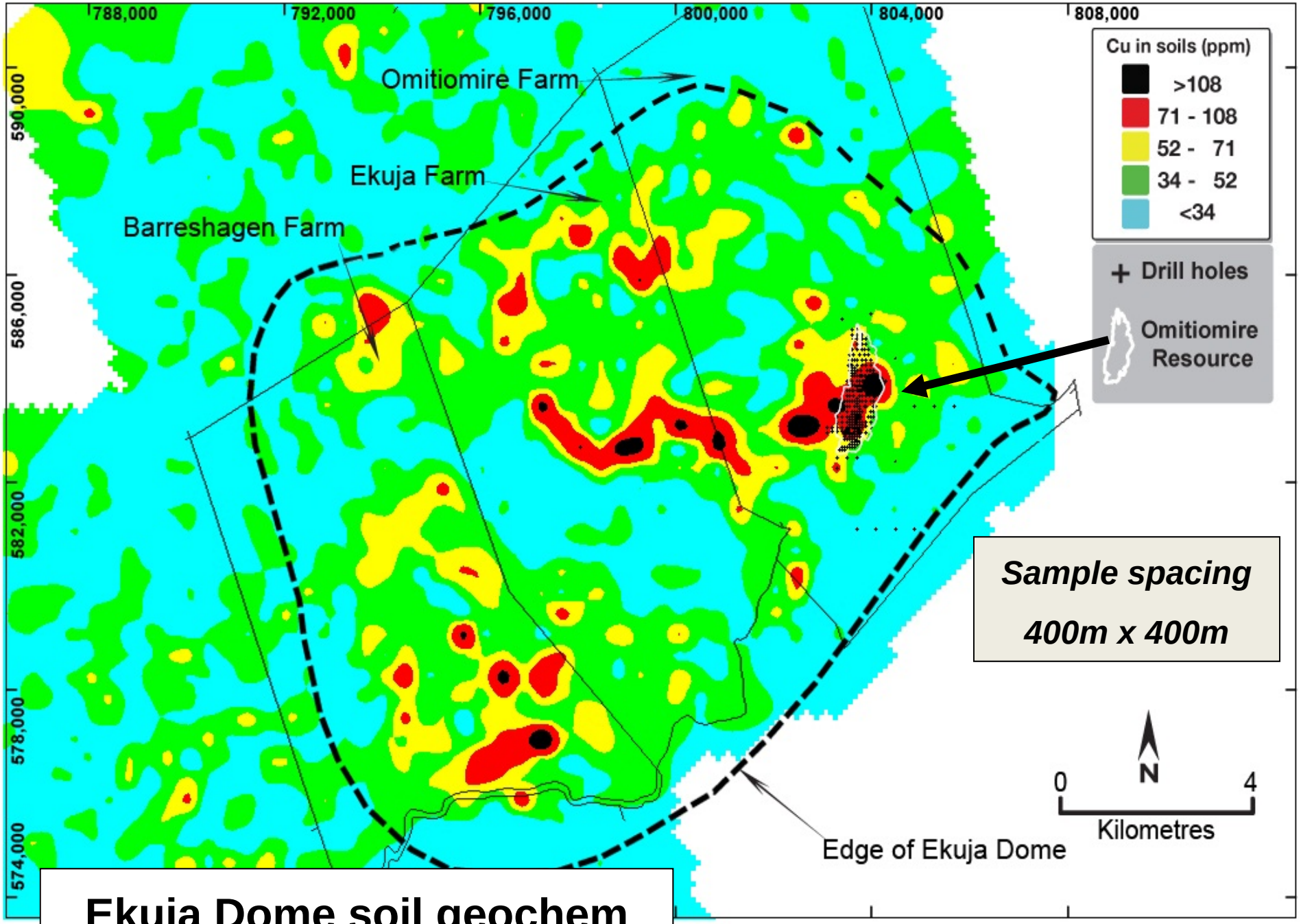
Is this the end of the line for IBML ?

IBML's response to global financial crisis

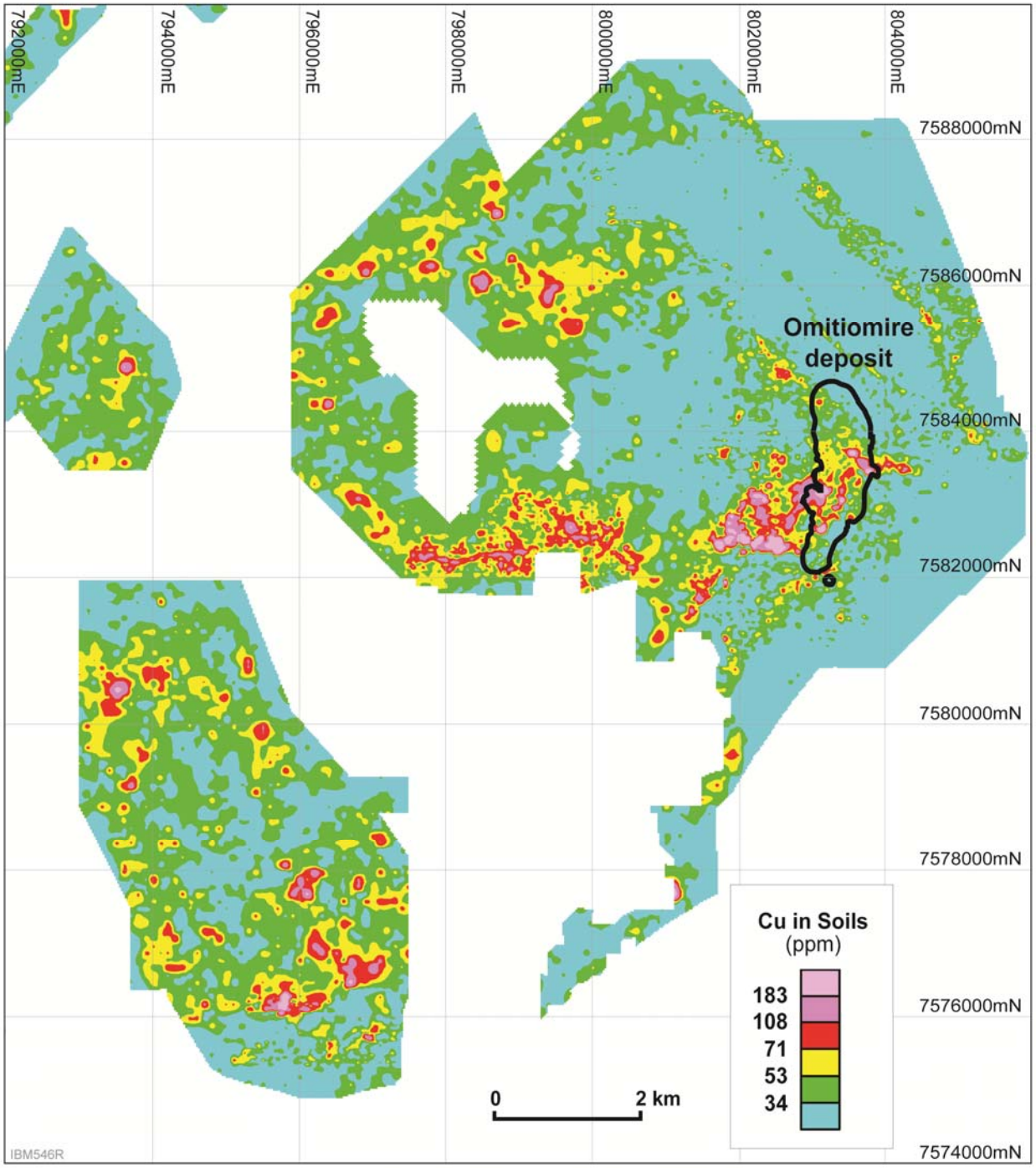
No new field vehicles this year



2009 - Low cost field work



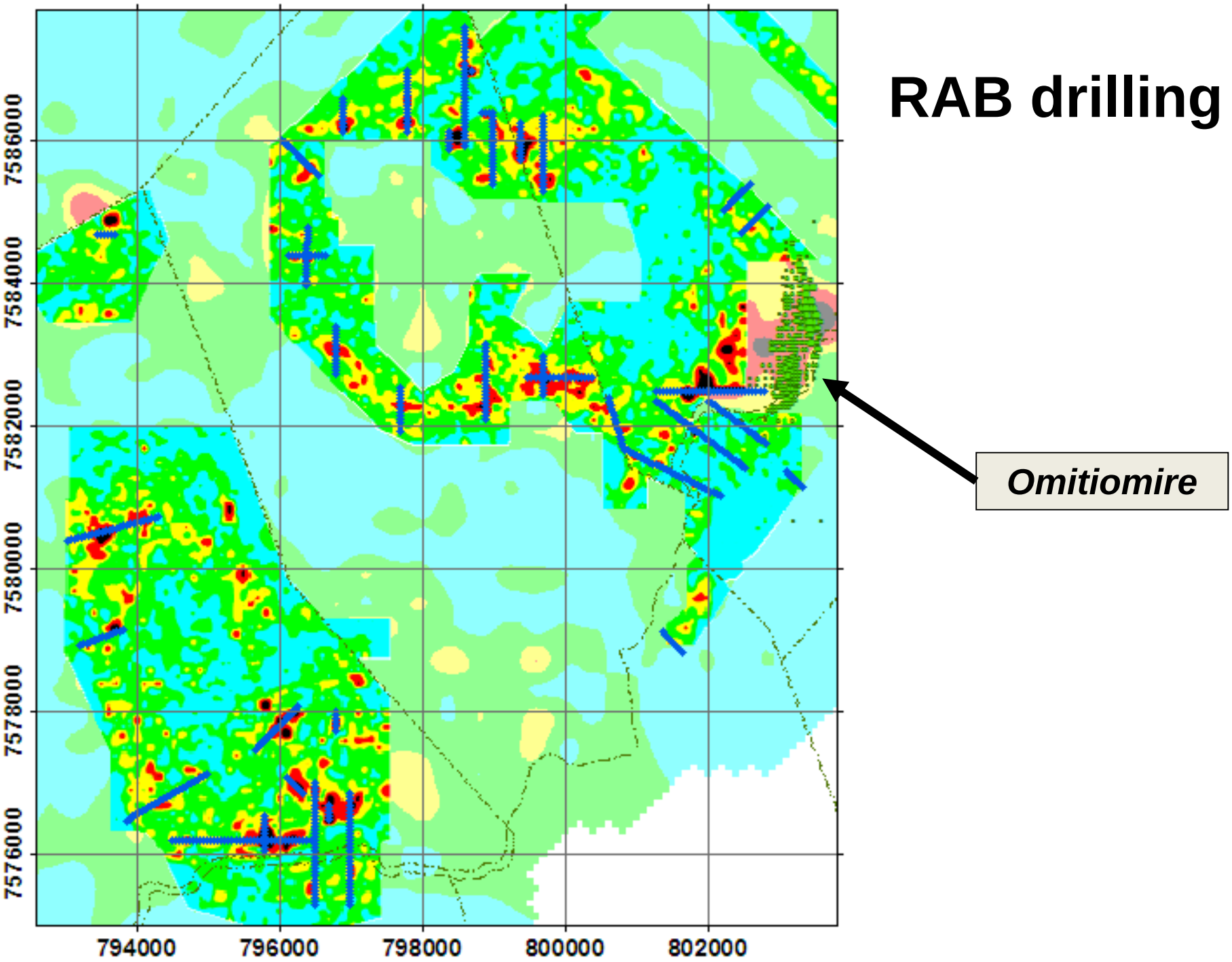
Ekuja Dome soil geochem



Infill soil geochem

Sample spacing

100m x 100m


RAB drilling
Omitiomire
7586000
7584000
7582000
7580000
7578000
7576000
794000
796000
798000
800000
802000

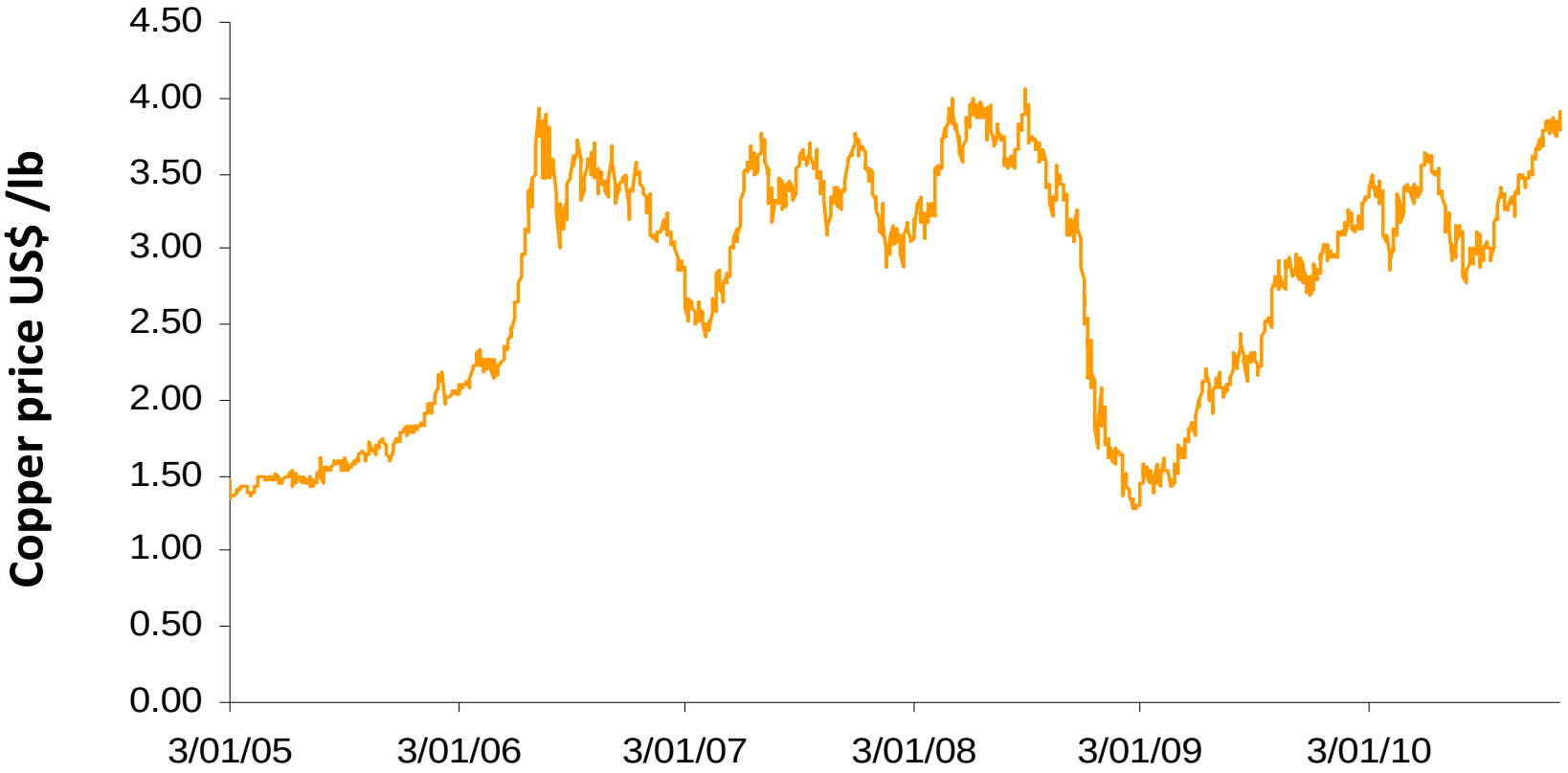
RAB drilling

Bush tucker

Christmas feast

Christmas fun & games

2010 - copper price bounces back



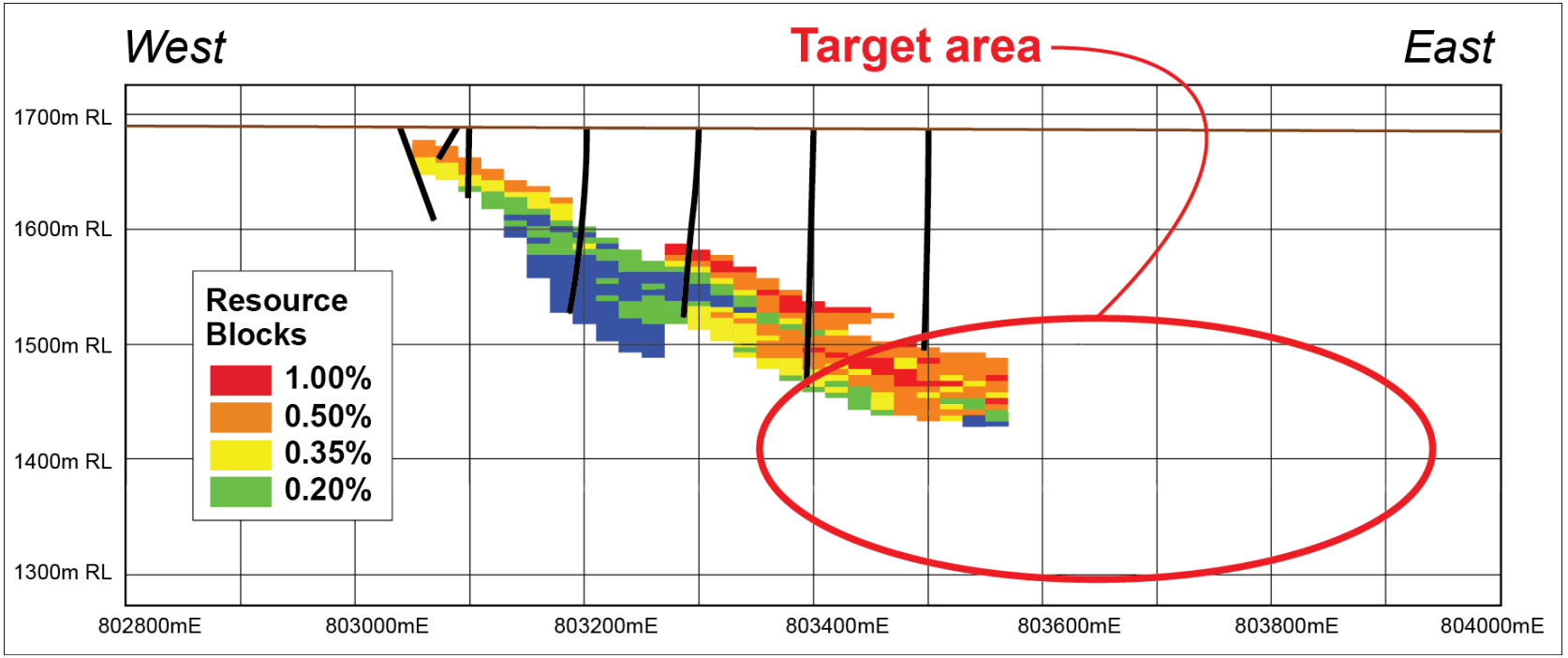
Company strategy 2010

- **Carry out a pre-feasibility study on the Omitiomire resource**
- **Prepare for an IPO and a listing of the Company's shares**
- **Seek JV funding for other projects**


2010 - Heading
towards an IPO
TOYOTA

Geology - 2010

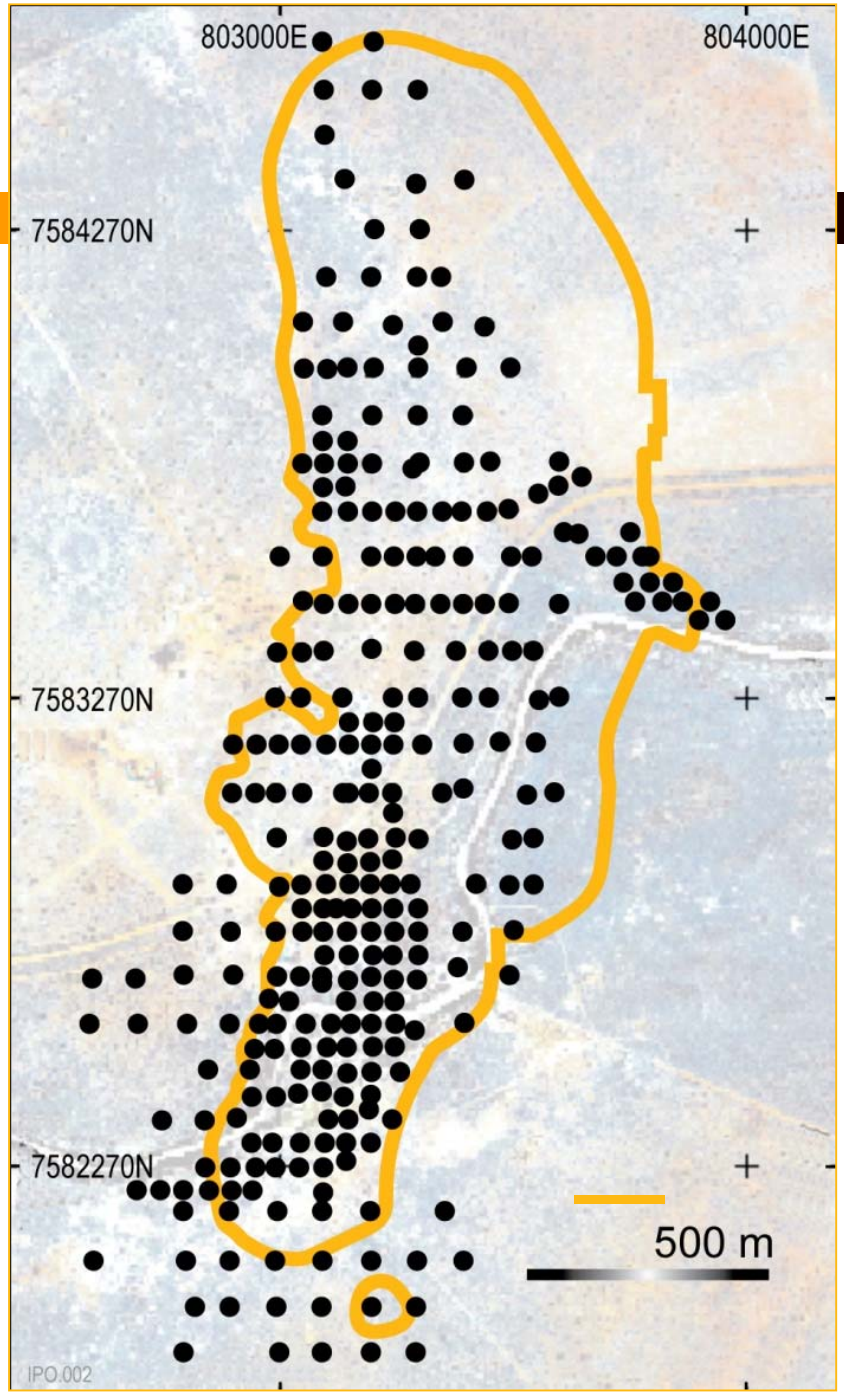
- Tabular body, 10 – 60m thick
- Grade & thickness increase down dip to east
- Growth potential + 1 Mt contained Cu



Resource 2010

Cut-off	Ore	Grade	Copper
% Cu	Mt	% Cu	tonnes
0.25	117	0.5	579,000

Drilling

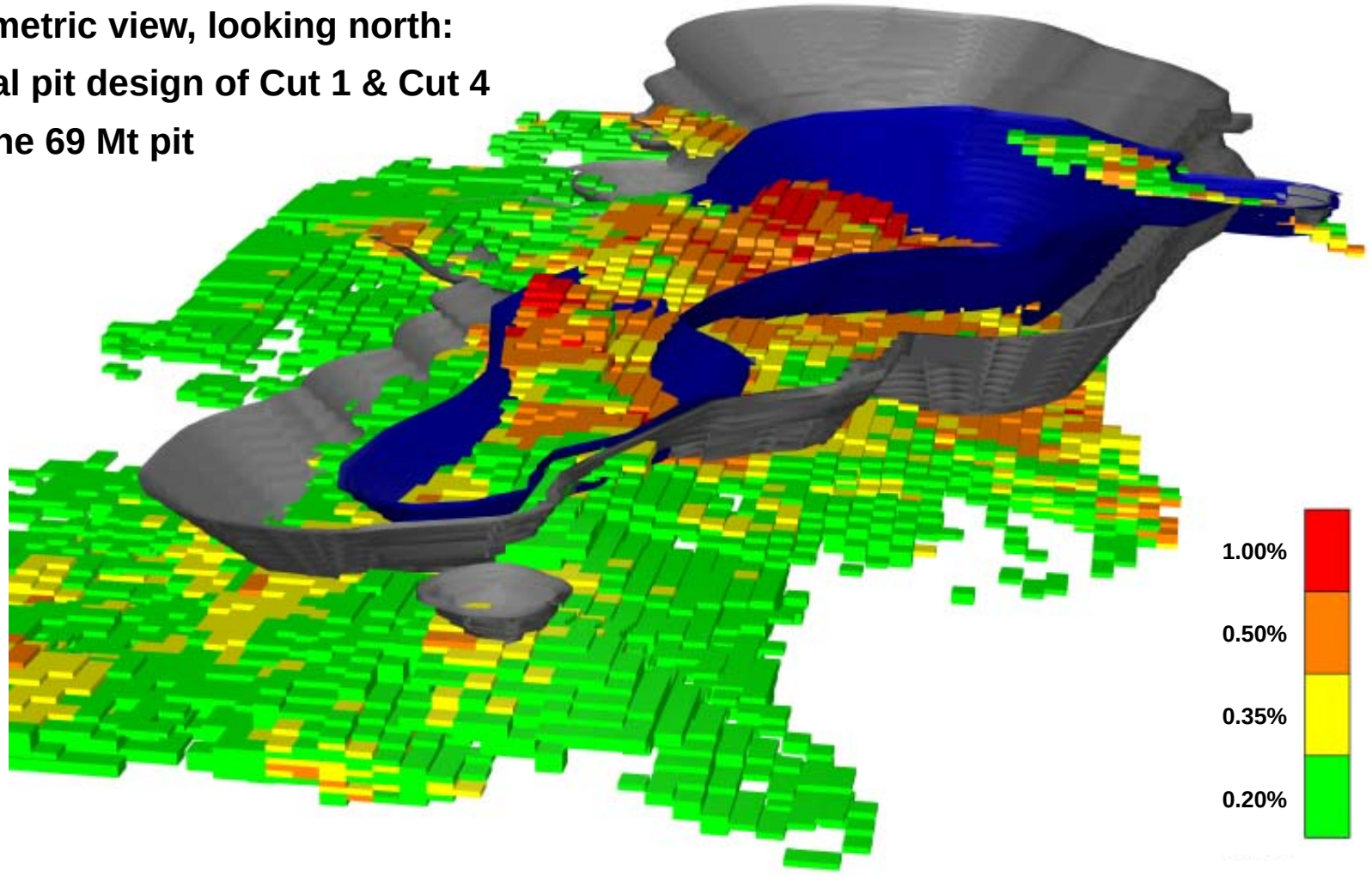


- **305 holes totalling > 42,000m**
- **Deposit covers 2,600m x 700m**
- **Depth > 150m at eastern edge**
- **Plunges north**
- **Remains open to northeast**

Proposed pit outline

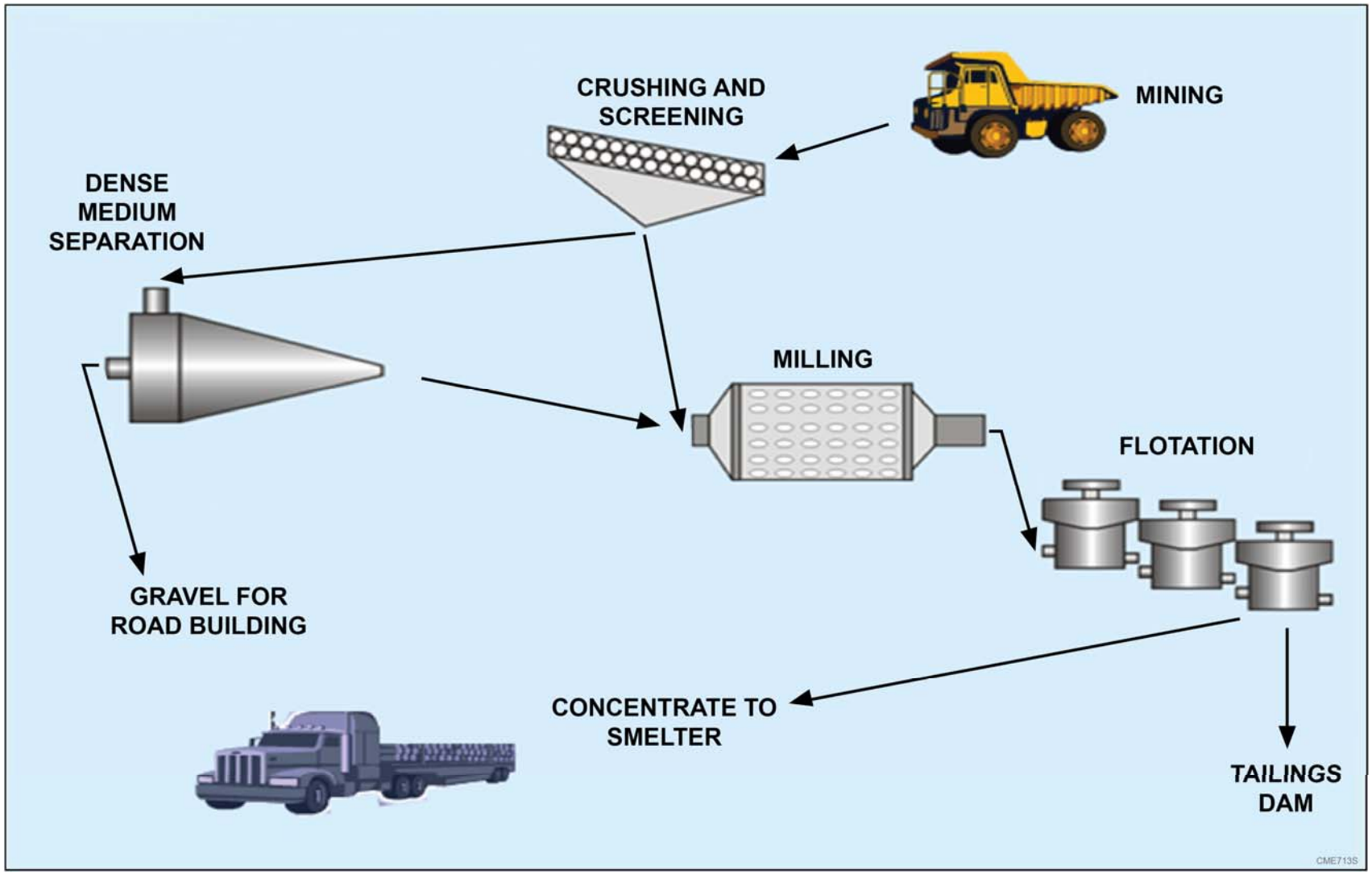
Pit design

Isometric view, looking north:
Final pit design of Cut 1 & Cut 4
of the 69 Mt pit



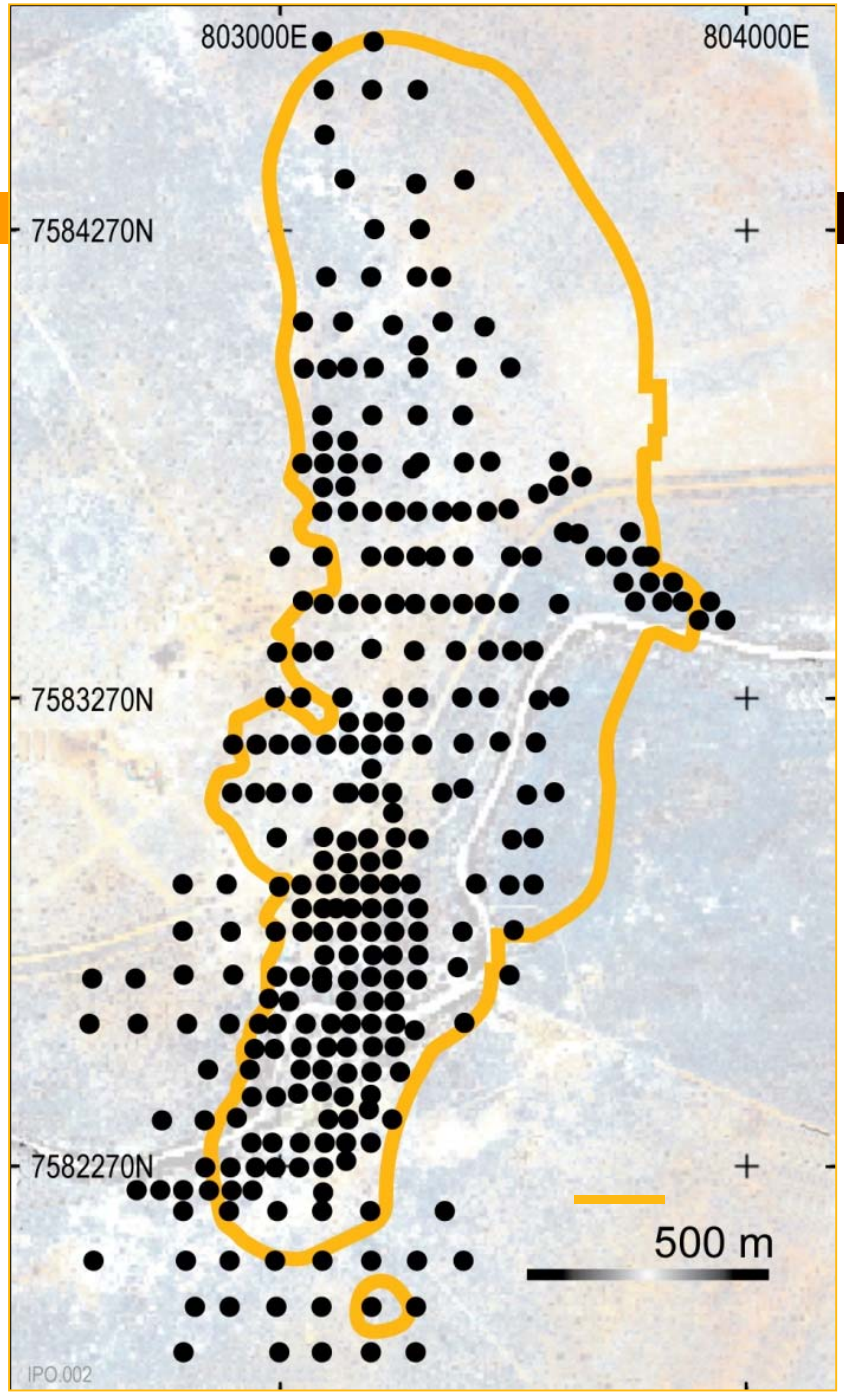

Harbour Bridge
Opera House
PIT OUTLINE
Martin Place
Hyde Park
Central Station
0
2km
CME193Sa
05/2010

Process flow sheet



Social & environmental impact assessment

Other issues



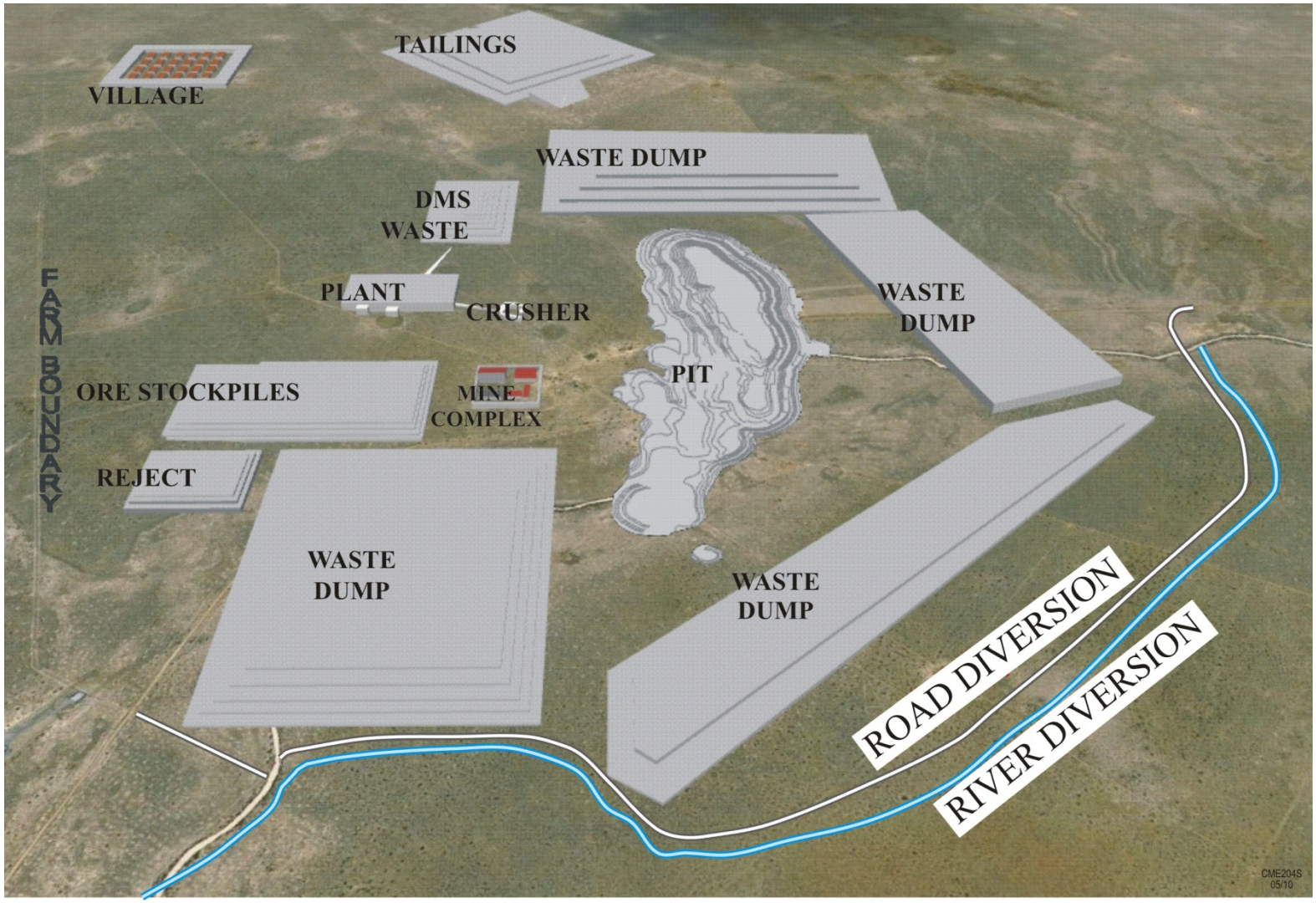
Public road

Black Nossob River

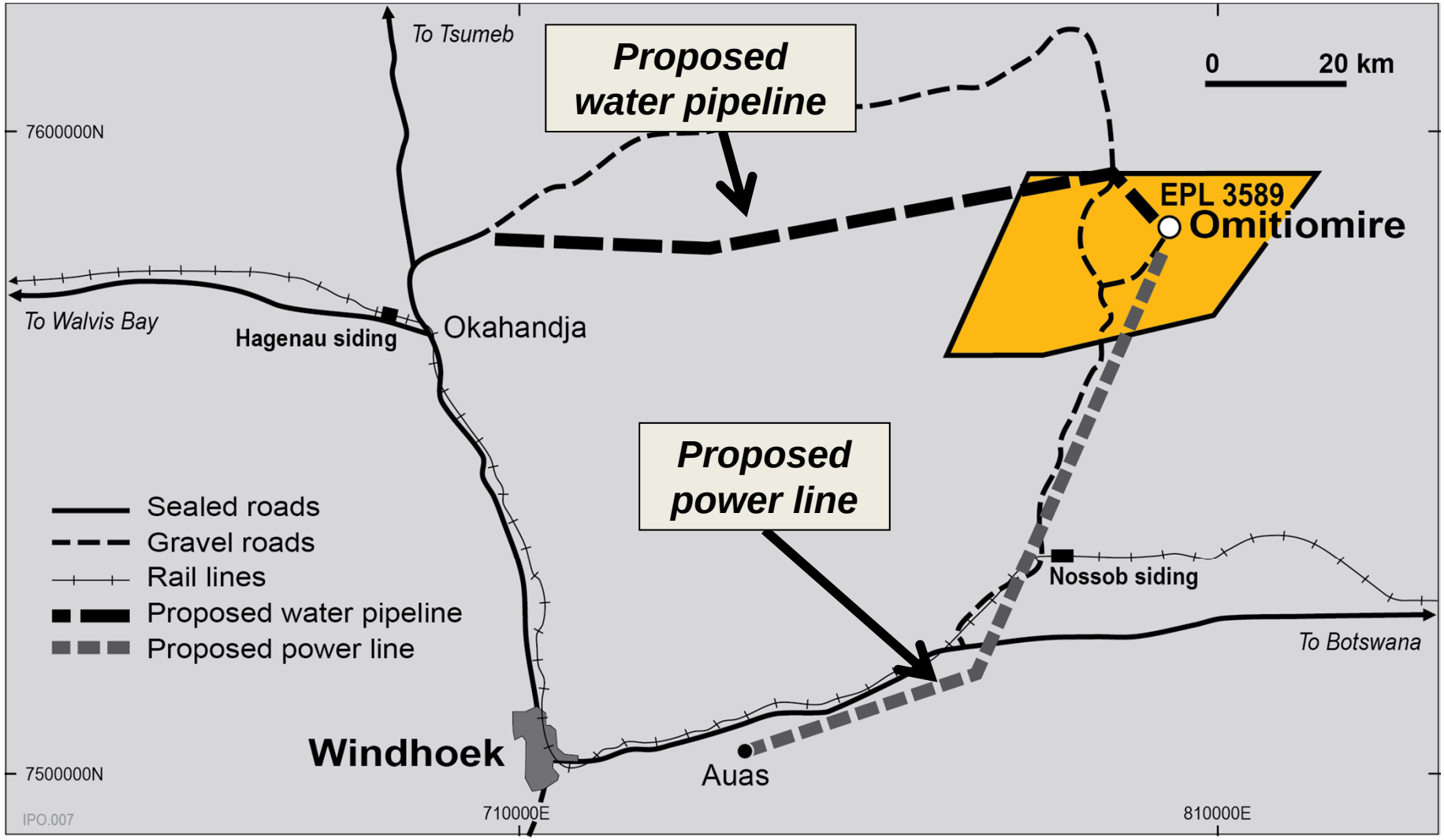
Black Nossob River - dry season

Black Nossob River - wet season

Proposed site layout



Infrastructure - big cost items



Preparing for IPO 2010

- New MD appointed
- Pre-feasibility study completed
- Independent expert reports
- Lawyer appointed
- Prospectus prepared
- Marketing

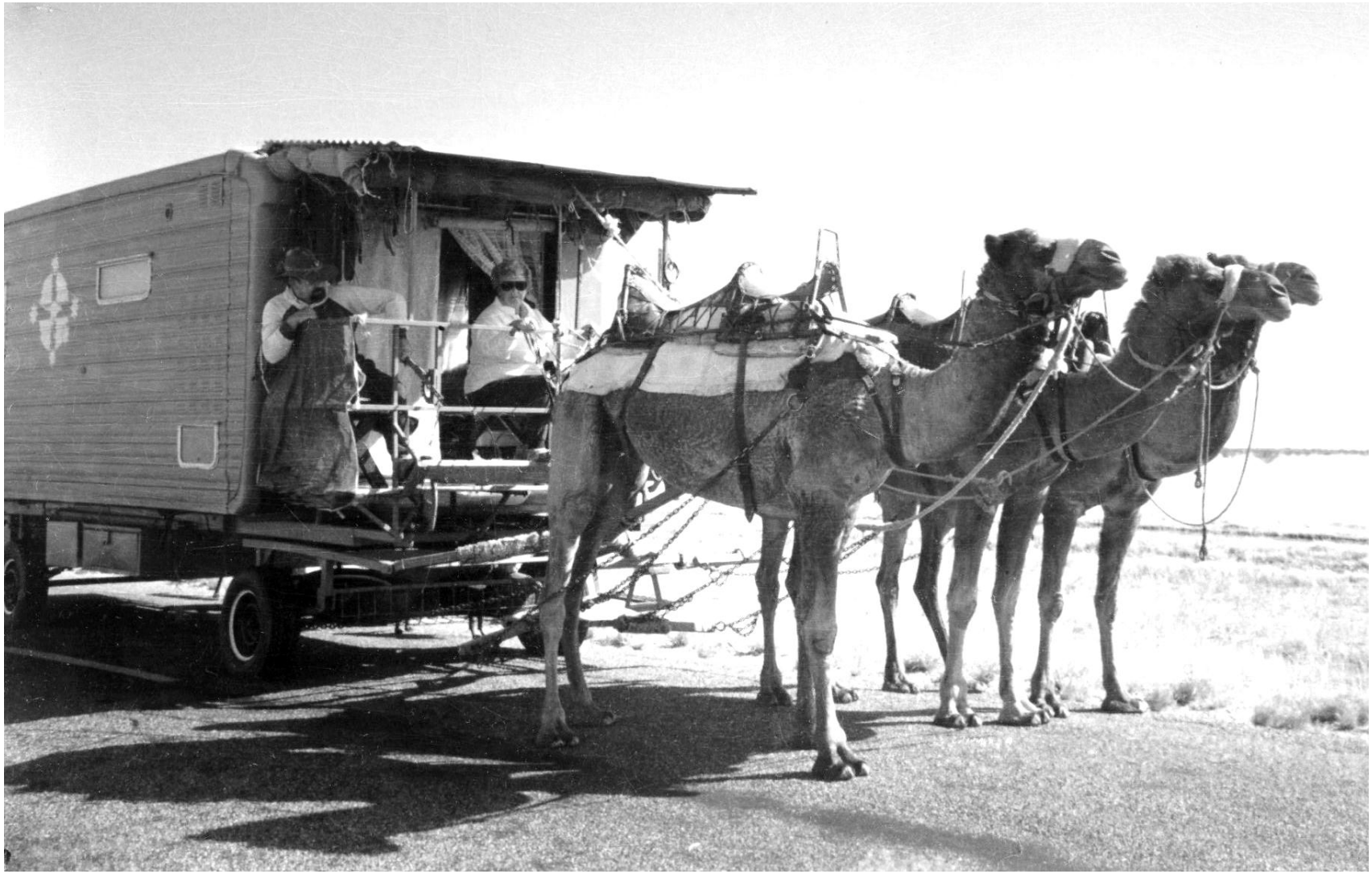
Frank Bethune

Planned a big celebration

But … doom & gloom (again)

- **Project financials not sufficiently attractive**
- **Unable to attract new investors**
- **Withdrew prospectus in early 2011**

Again - no new field vehicles this year



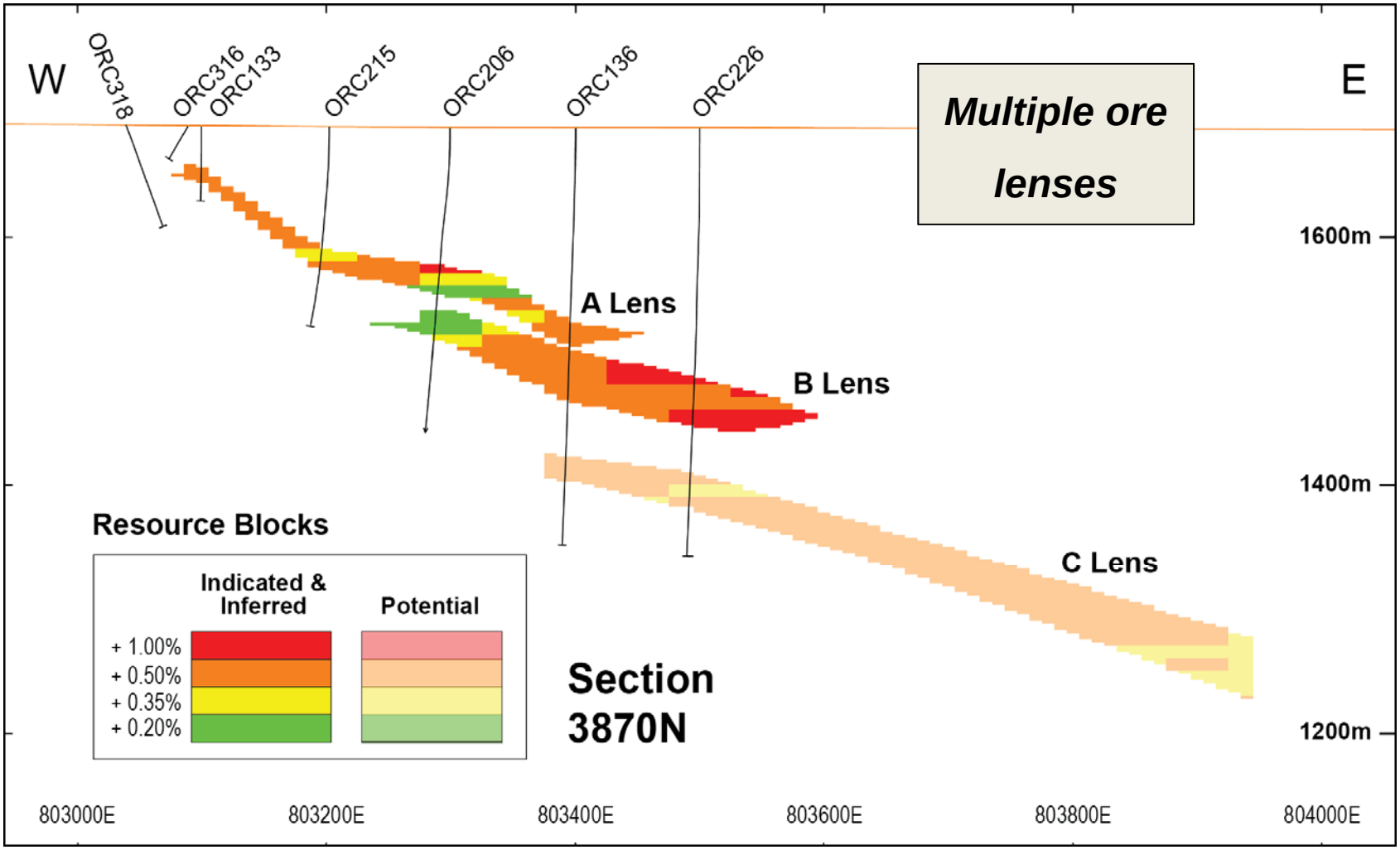
Omitiomire camp

Tea break

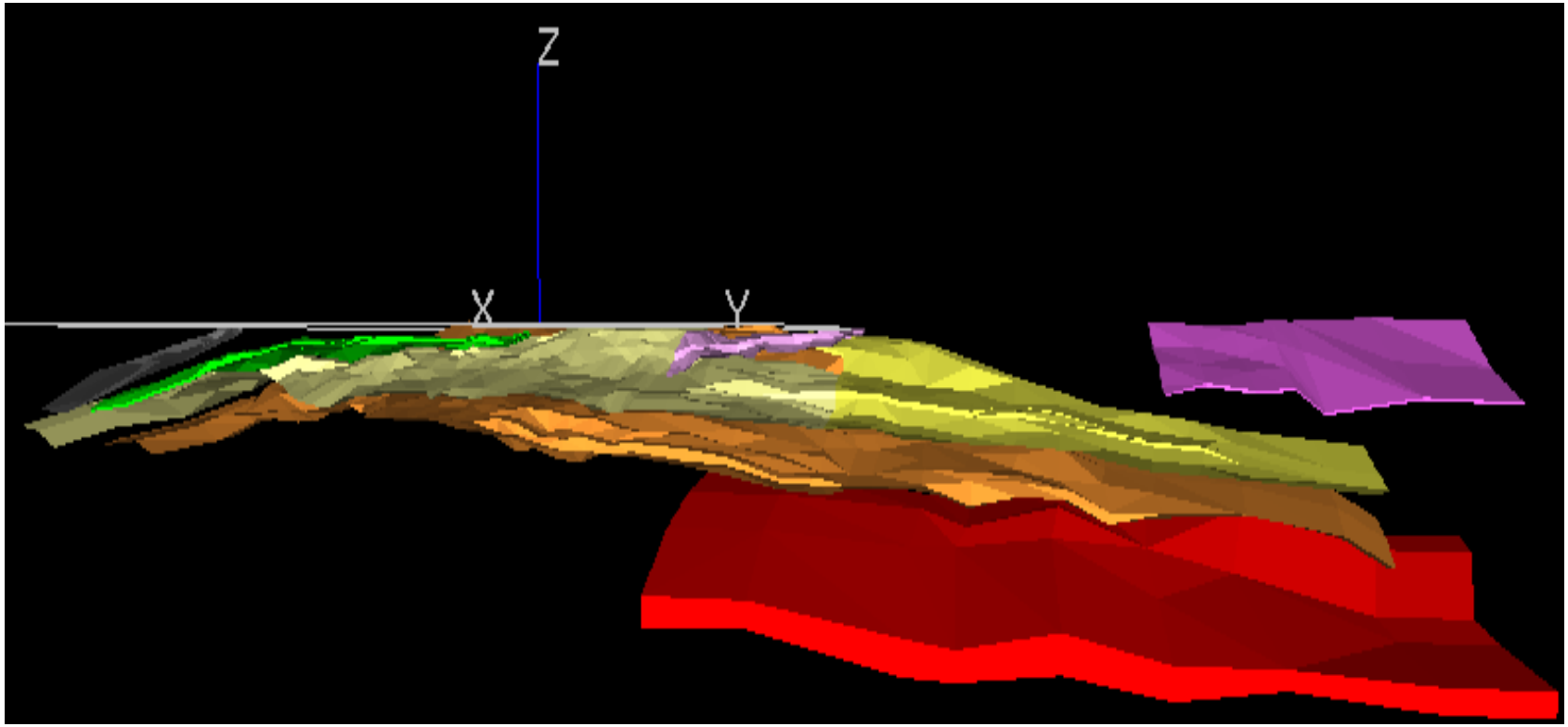
Snake trouble

Understanding the geology a bit better

New structural interpretation

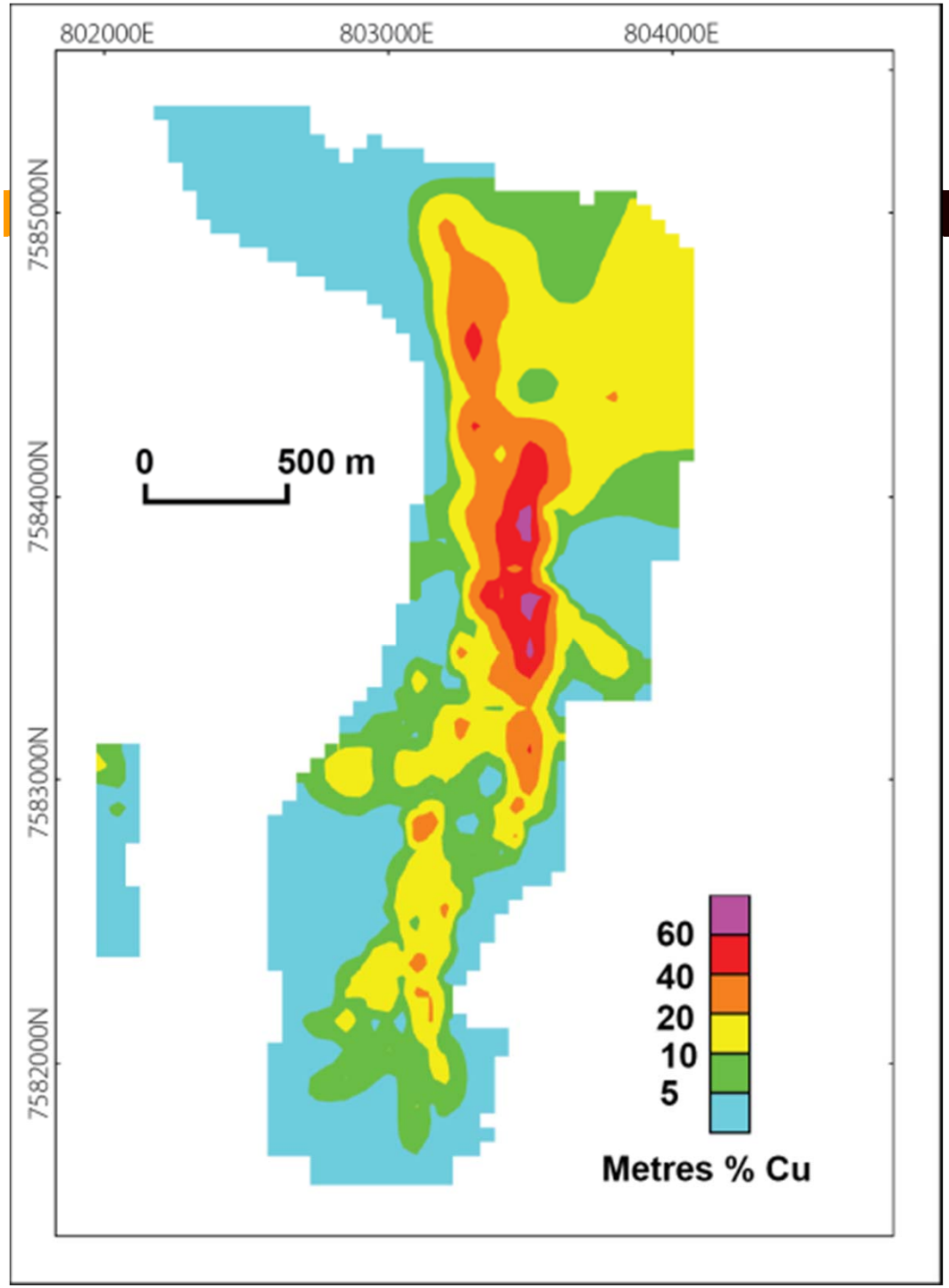


Omitiomire - view from east



Purple	Bruce Lens	Yellow	A Lens
Grey	Kaya Lens	Orange	B Lens
Green	Central Lens	Red	C Lens

Plan view



Grade x thickness

Resource estimate, August 2012

Cut-off grade	Resource	Grade	Metal
(% Cu)	(Mt)	(% Cu)	(tonnes)
0.25	136	0.53	712,000

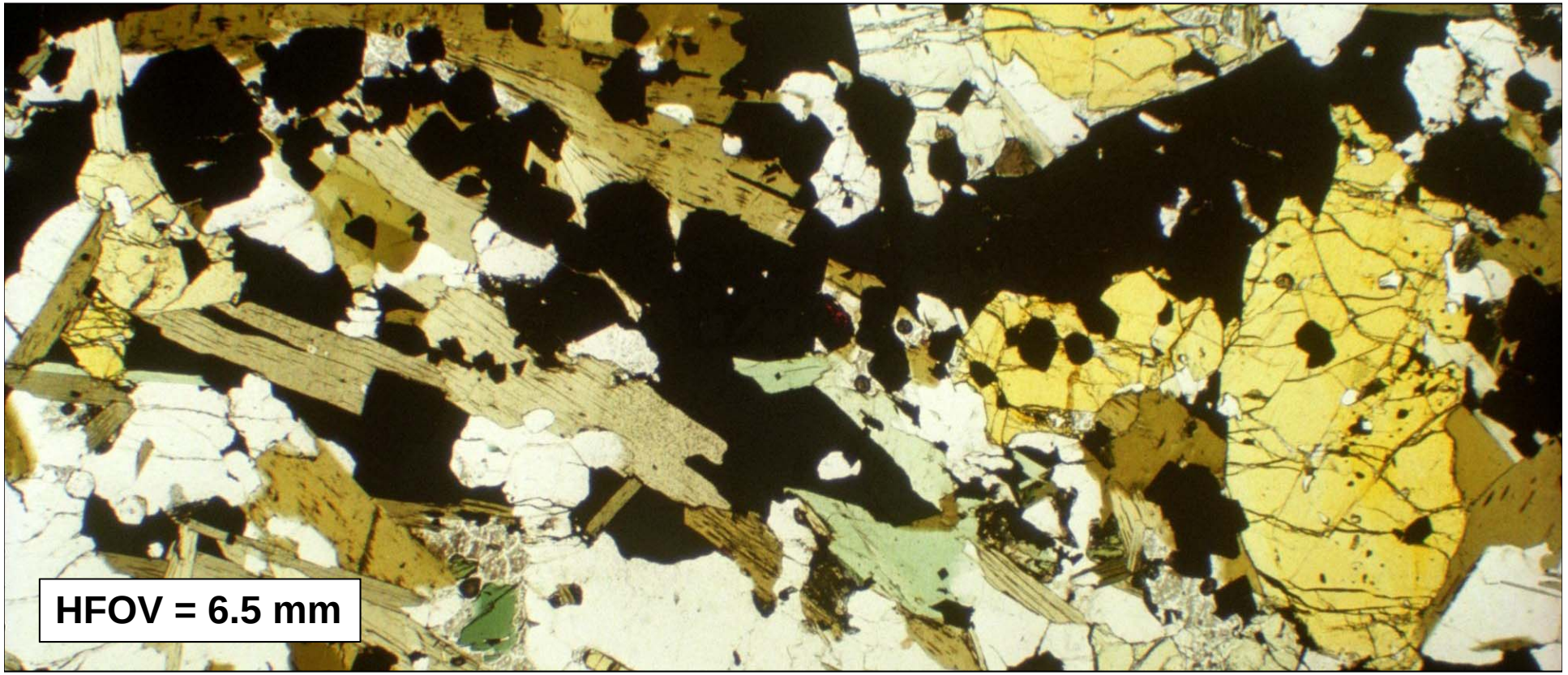
Additional potential in area of sparse drilling:

94 Mt at 0.53% Cu at 0.25% Cu cut-off (516,000 t copper)

High grade copper in shear zones

Narrow zones of biotite-epidote schist with chalcocite, sphene & some fuchsite

Thin section of ore zone



Epidote poikiloblasts (yellow) with magnetite & chalcocite inclusions

→ Chalcocite is a primary mineral

Shear zones

Coarse-grained chalcocite in narrow shear zone


… this drill core is ore-some

High strain zones

Truncation surfaces between high strain zones (biotite-epidote schist) and primary contacts or S2

Shear zones

Narrow shear zones are characterised by -

- **Strong deformation (shearing)**
- **Alteration to biotite-epidote**

  i.e. strong retrograde fluid flow
- **Concentrations of chalcocite Cu_2S**

The brown mineral is chrome-epidote

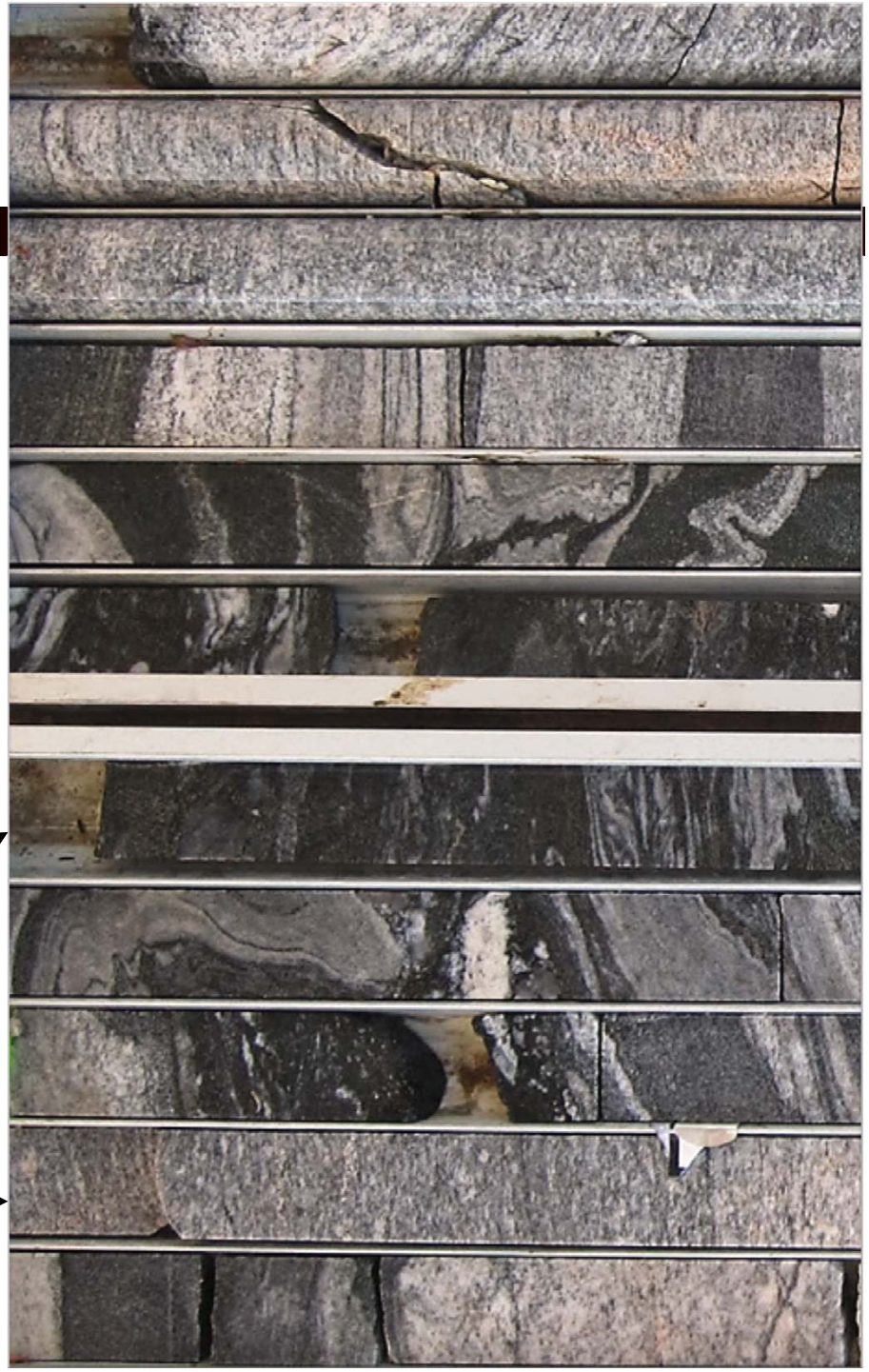
Omitiomire deposit

More broadly, the three ore lenses are contained within a high strain zone 100m thick

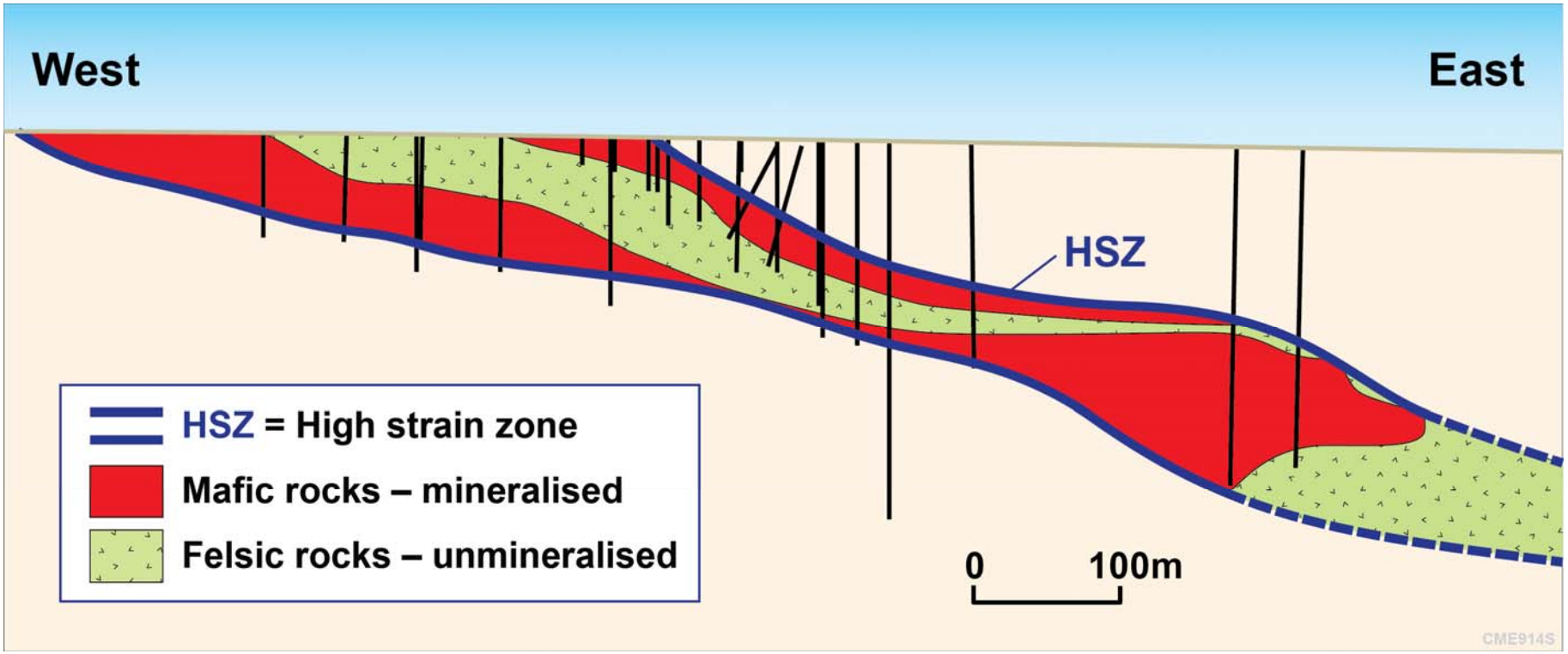
Within this zone, the rocks are variably deformed (sheared)

Mafic rocks strongly deformed & altered

Felsic rocks less deformed



Omitiomire - cross section



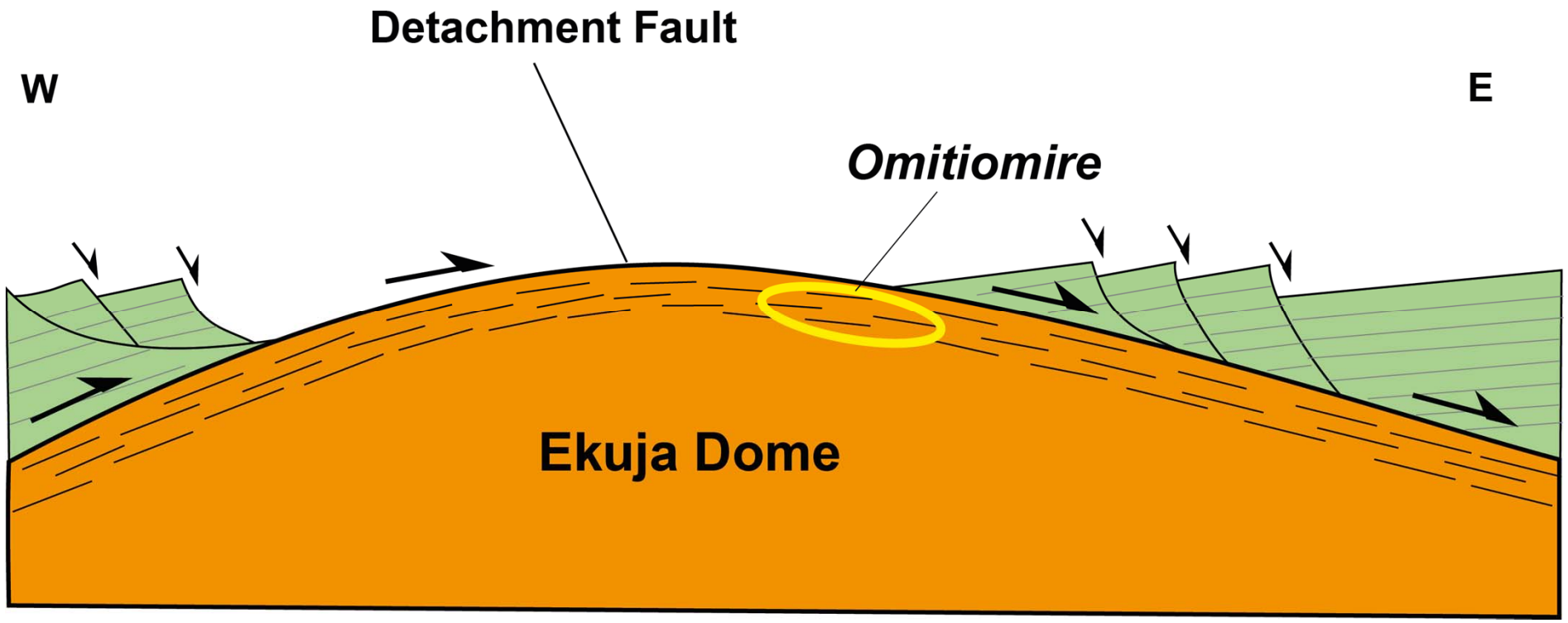
The Omitiomire deposit is within a high strain zone up to 100m thick

Copper is hosted by altered mafic rocks in this high strain zone

Ore genesis

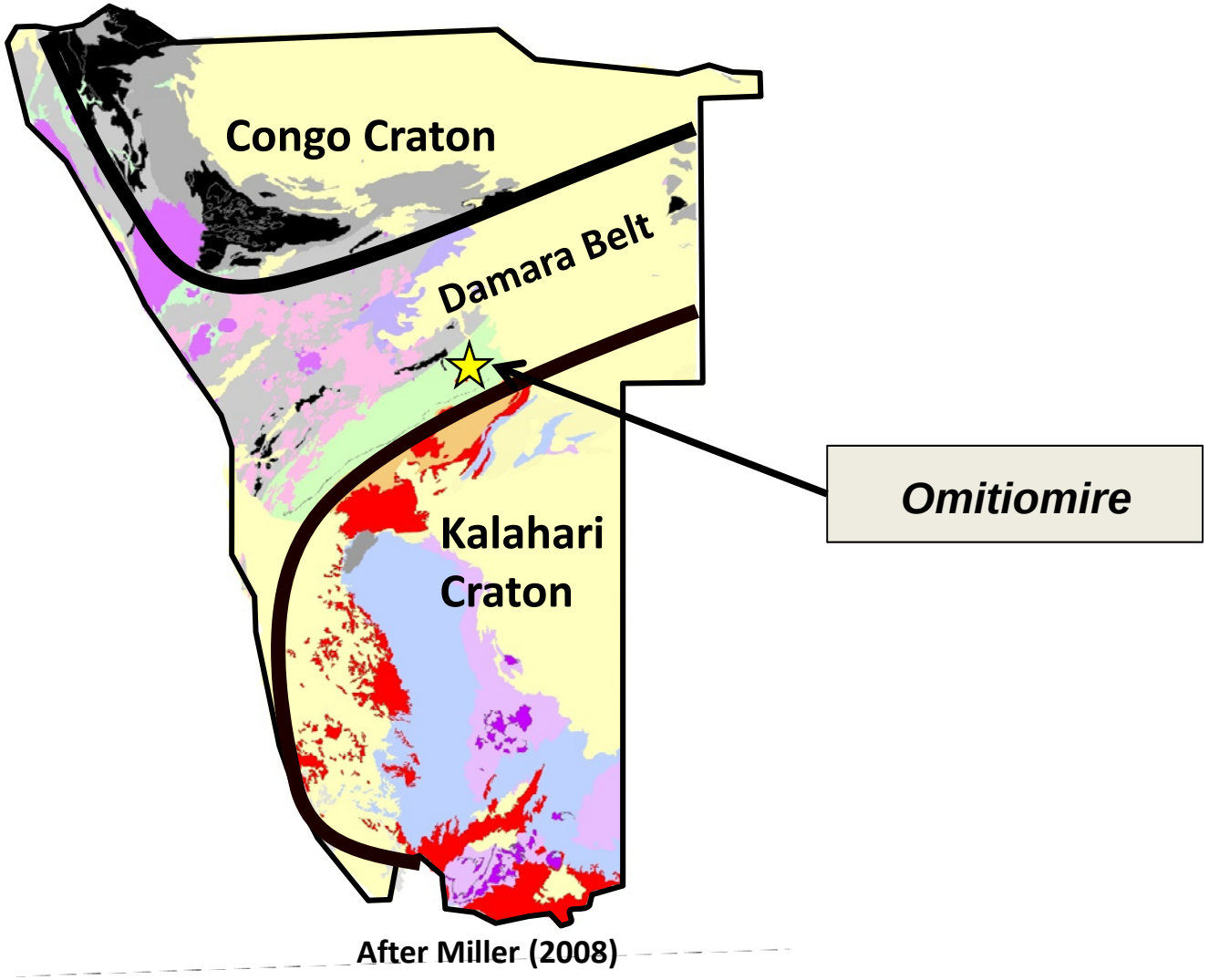
- Retrograde metamorphic fluid
- Channelled into shear zone
- Late in Damaran orogenic event
  - post-peak metamorphism
- Reacted with tectonised amphibolite

Structural interpretation

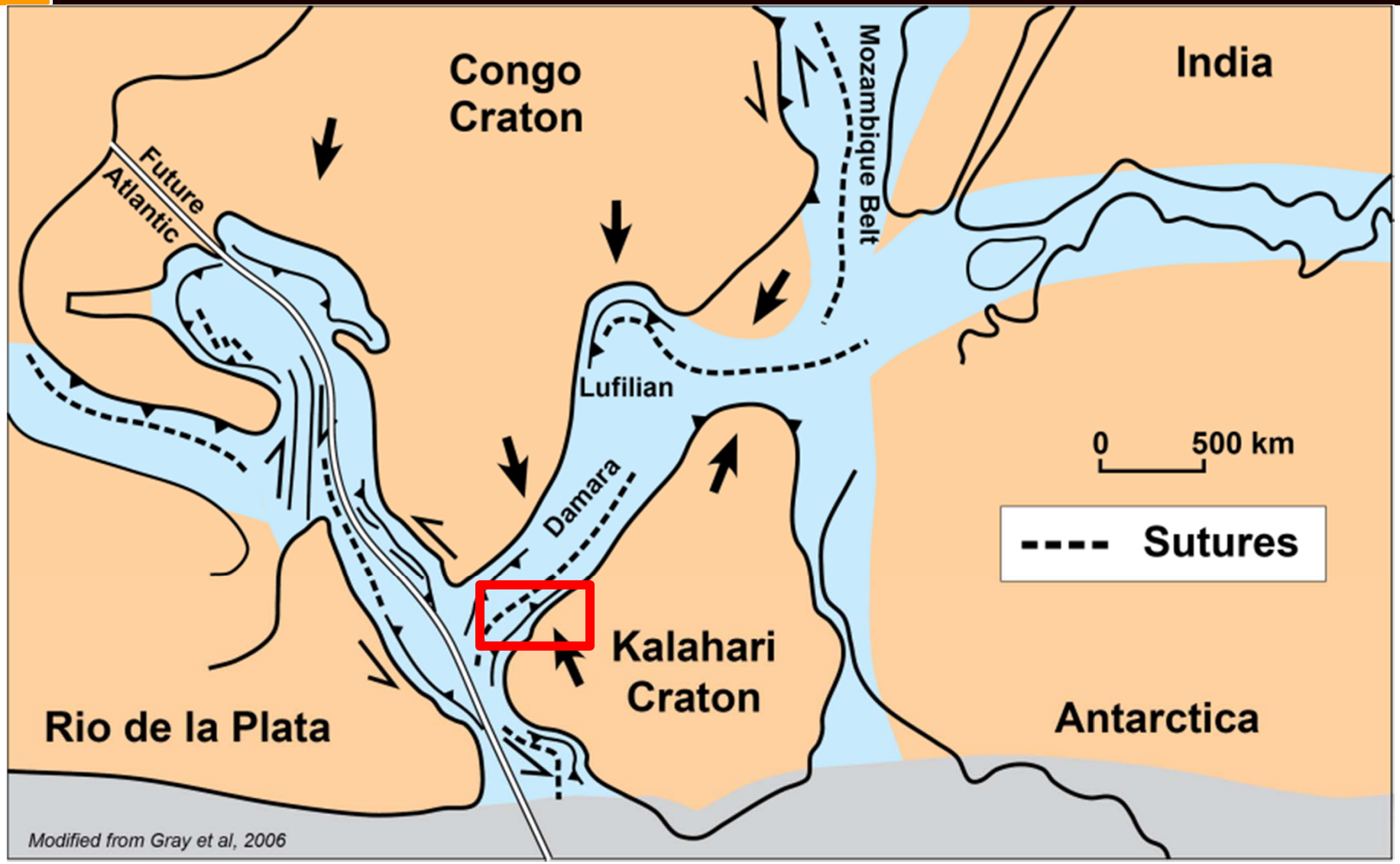


Interpretation: High strain zone related to low-angle detachment faulting during exhumation of the Ekuja Dome

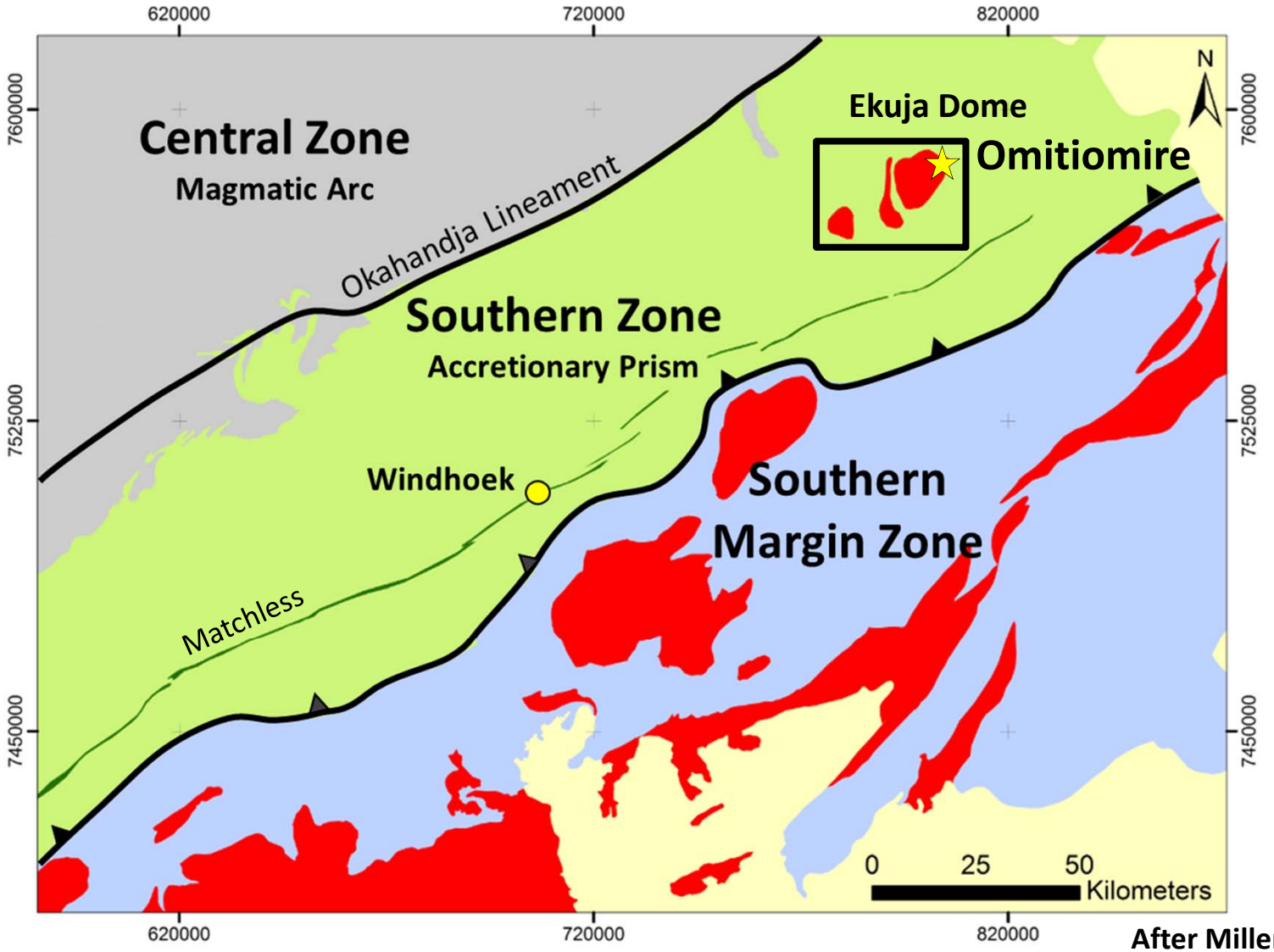
Regional setting



Pan-African orogenic belts 600 – 500 Ma

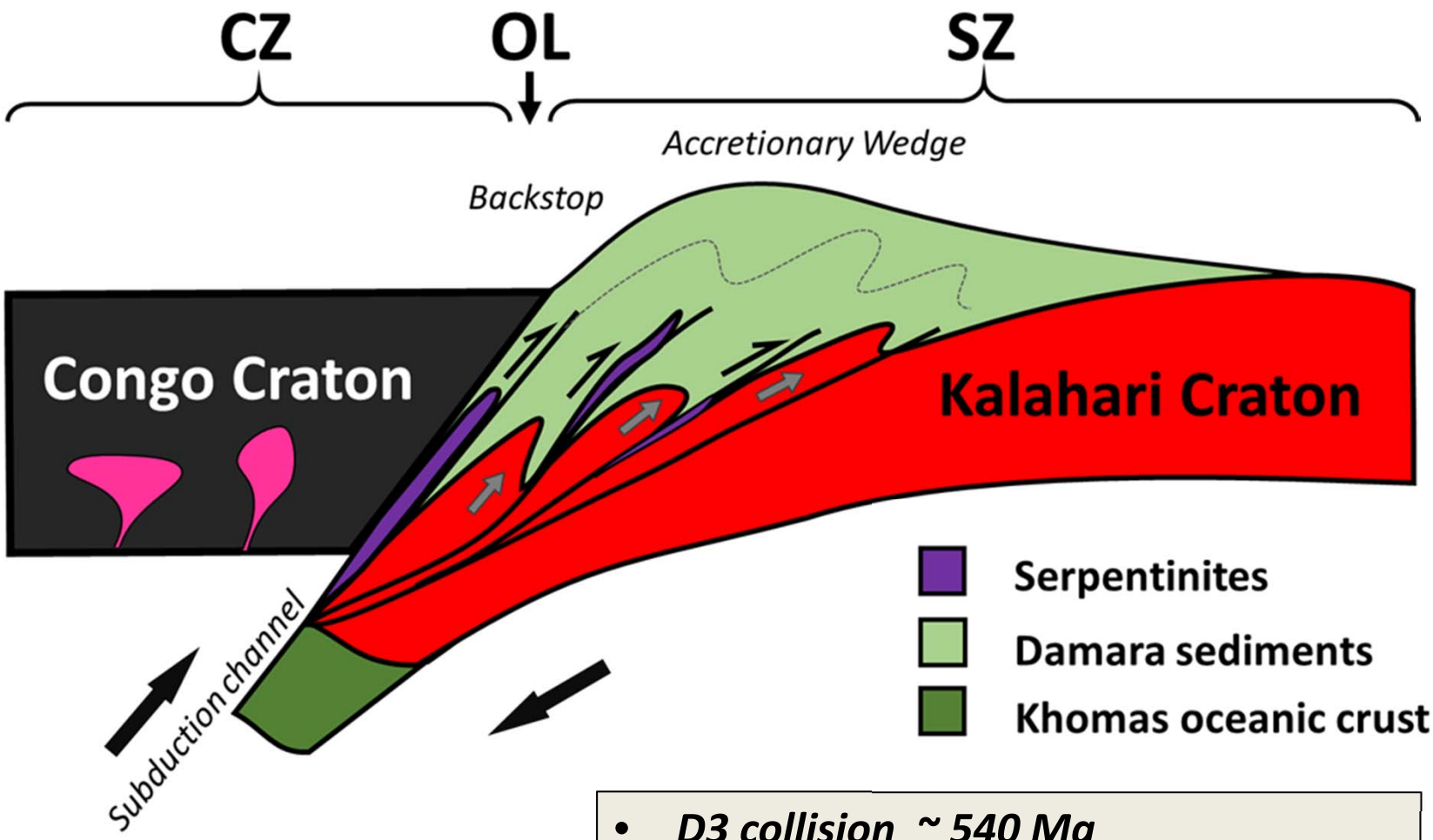


Regional setting



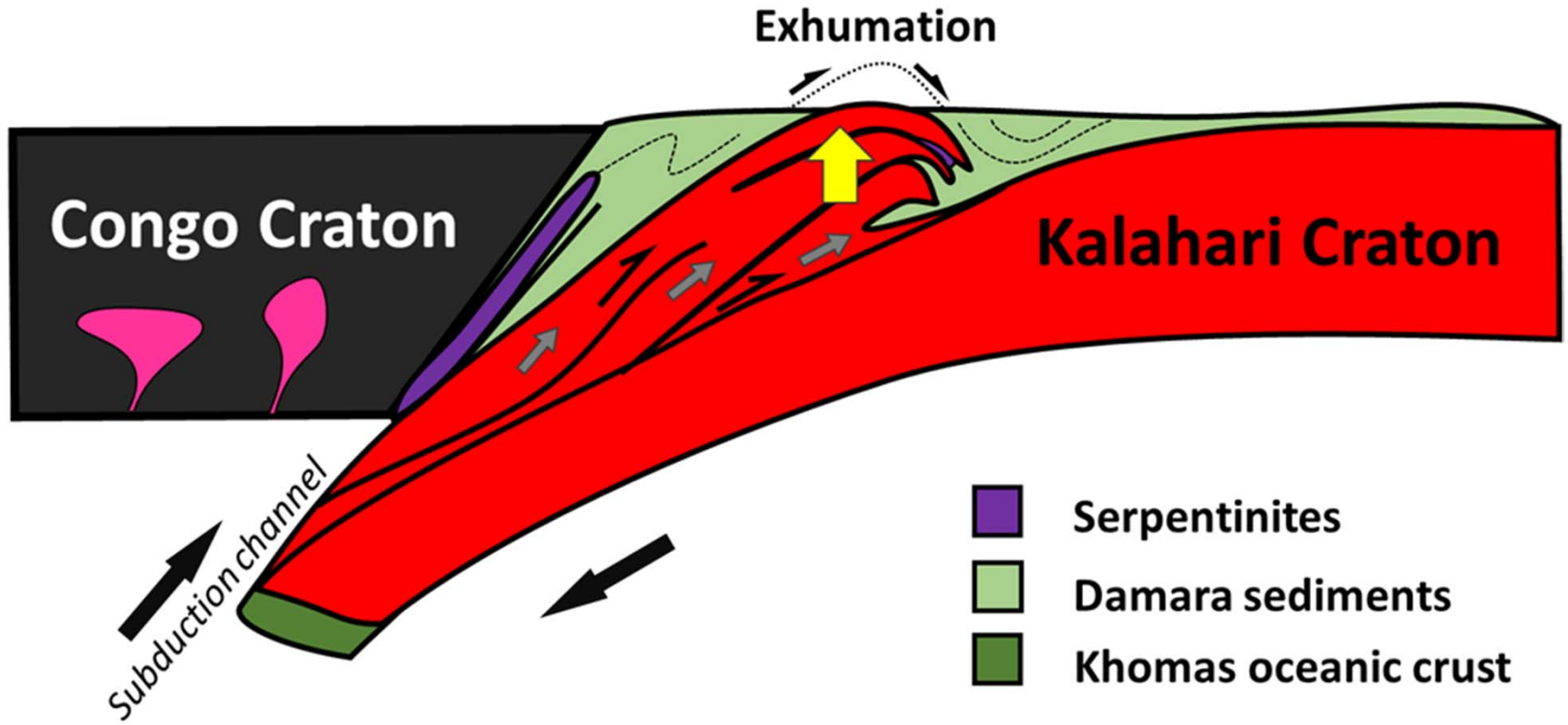
After Miller (2008)

Tectonic evolution - continental collision



- *D3 collision ~ 540 Ma*
- *M2 metamorphic peak 535 – 530 Ma*

Tectonic evolution - dome exhumation

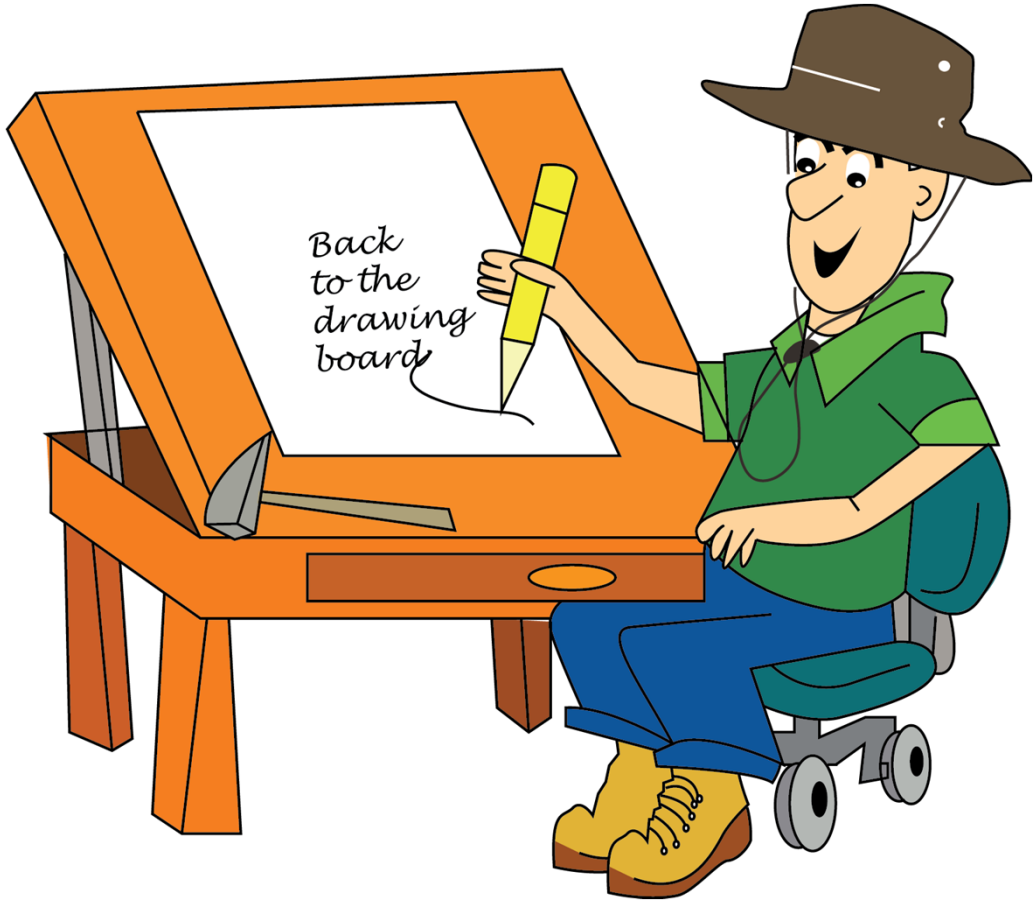


Sphene cores ~ 1100 Ma
Sphene rims 520 – 485 Ma

Retrograde event

Back to the drawing-board:

New money, new strategy



Heilong investment

Luo Zhehong

Liu Rui

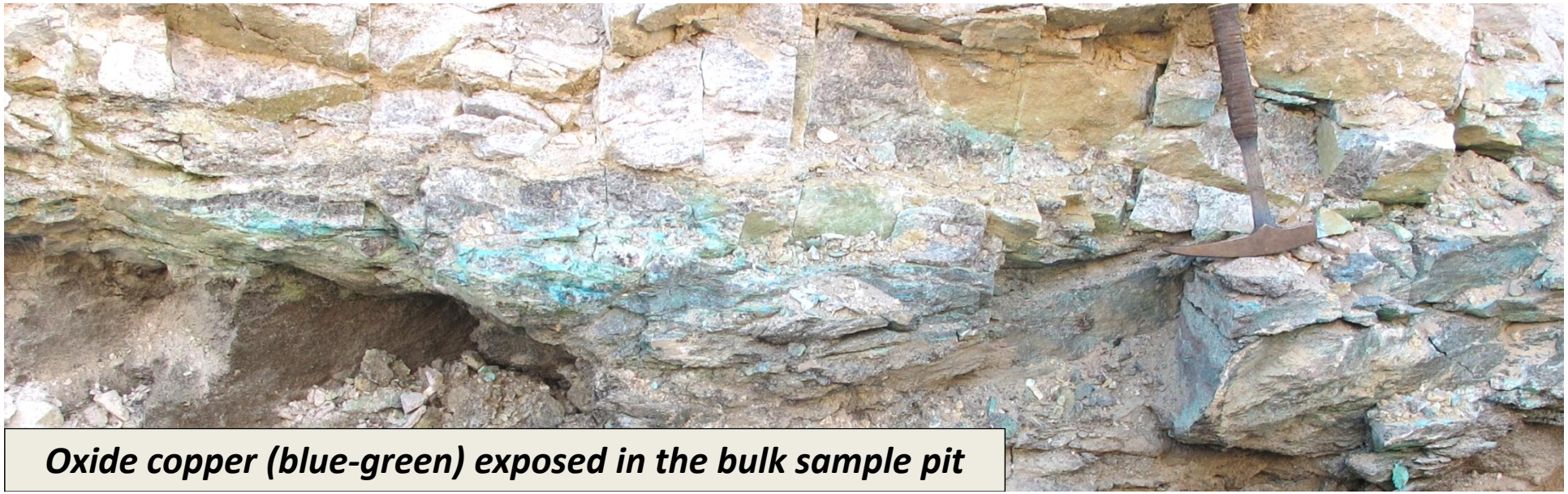
- **Heilong Group established in 1997**
- **Based in Harbin, the capital of Heilongjiang Province, China**
- **Exploration & project development expertise**
- **Initial investment in IBML in 2012**
- **Major shareholder in IBML in 2013**

Finally - a new field vehicle !!

New strategy

A two-stage approach to bring Omitiomire into production:

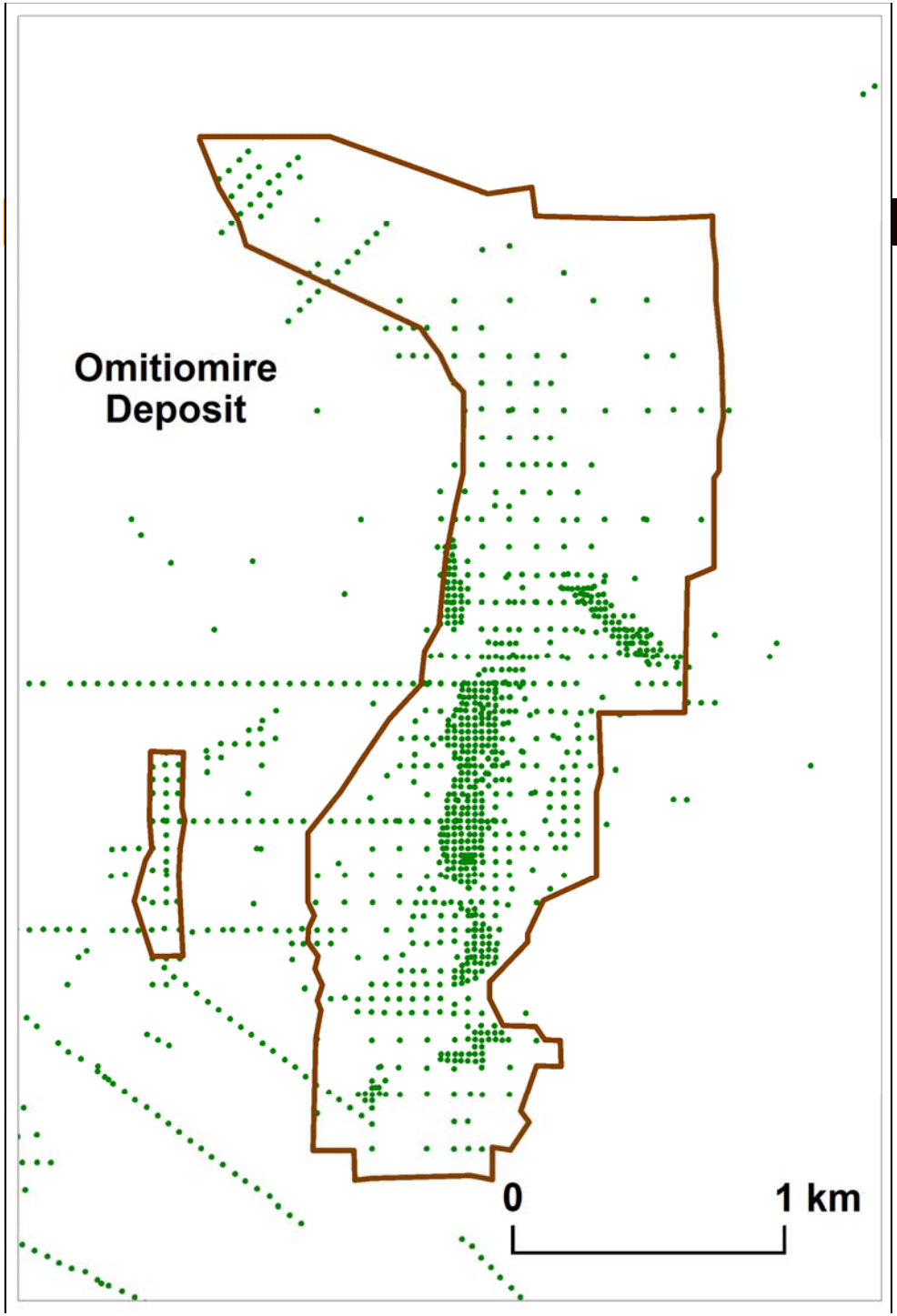
- **Phase 1 - a small project based on oxide copper resource**
- **Phase 2 - a larger project based on sulphide copper resource**



Oxide copper (blue-green) exposed in the bulk sample pit

2012 - Scoping study

2013 - Definitive feasibility study

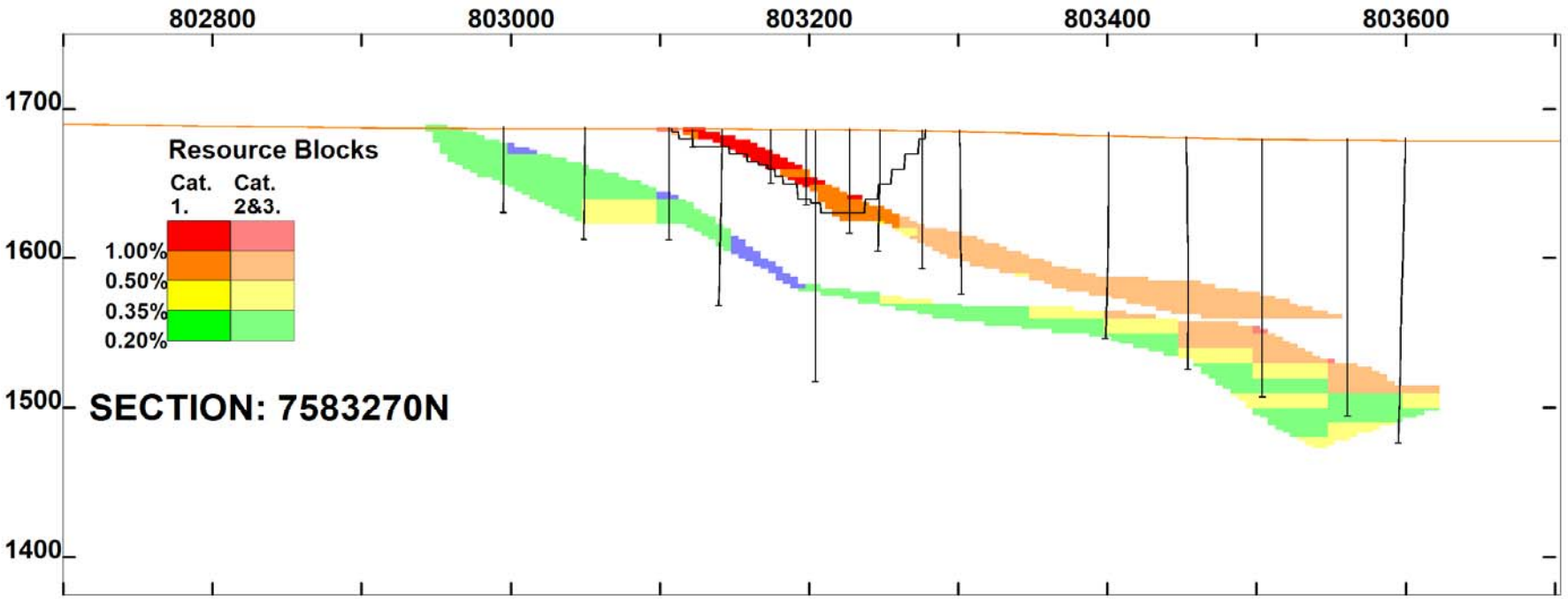


Infill drilling

- **Three shallow high grade zones selected for mining**
- **Planned maximum depth 50m**
- **Reserve: 3.14 Mt at - 0.60% Cu (oxide); plus 0.33% Cu (sulphide)**

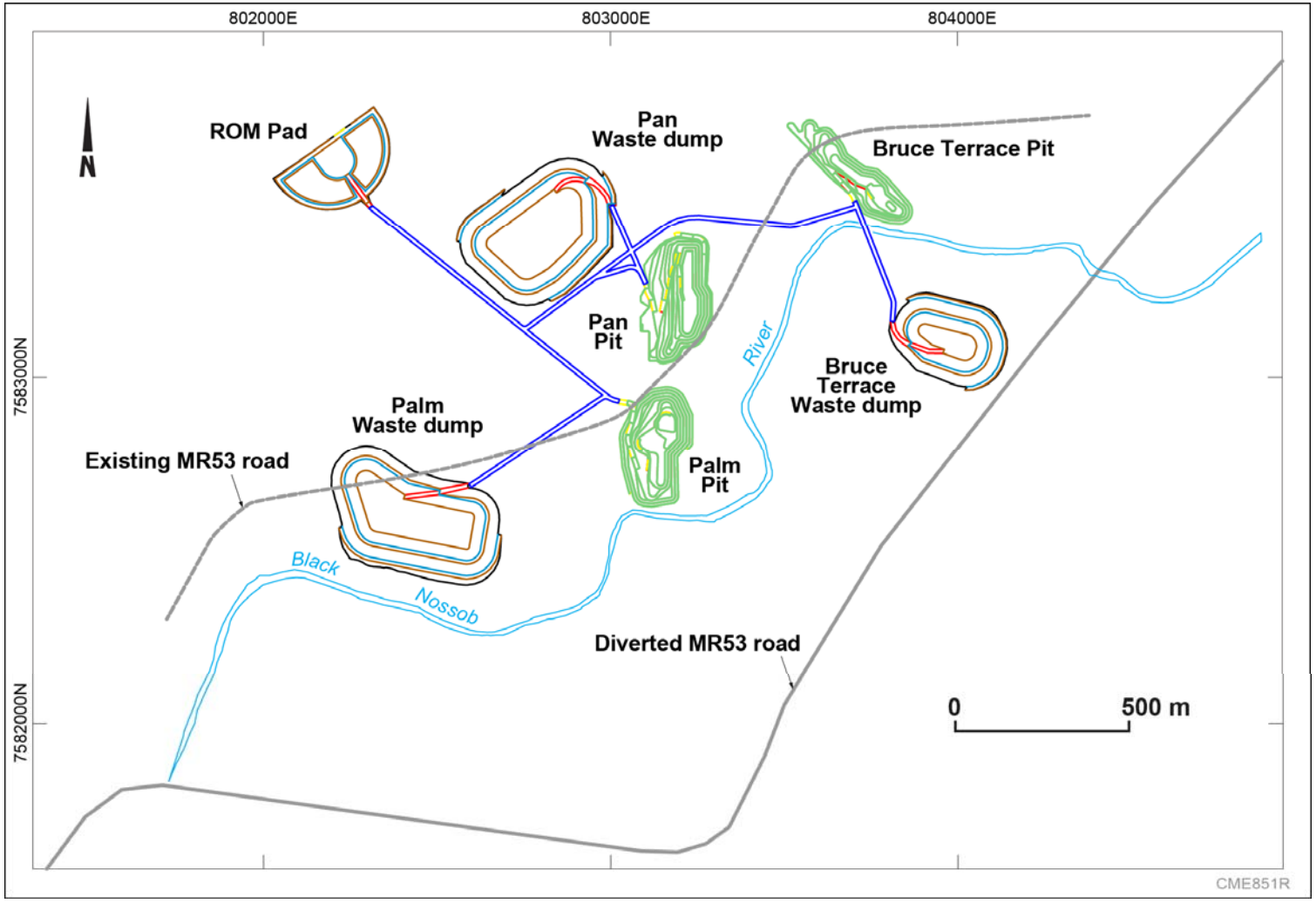
The clusters of closely-spaced holes show oxide copper zones proposed for early mine development

West to east section



Section showing Pan Pit

Phase 1 project: pit layouts



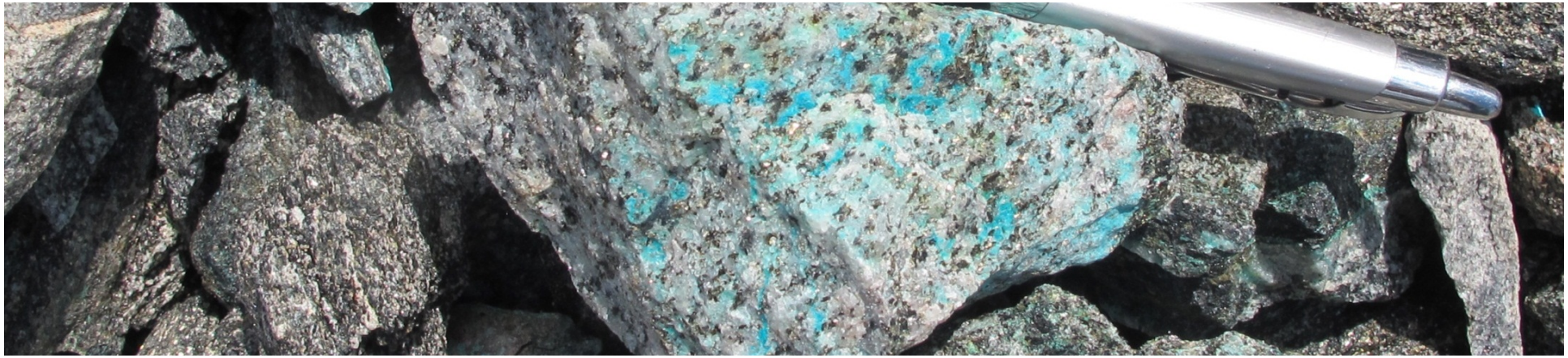
Three small pits located on near-surface high grade oxide copper

Phase 1 project: ore processing

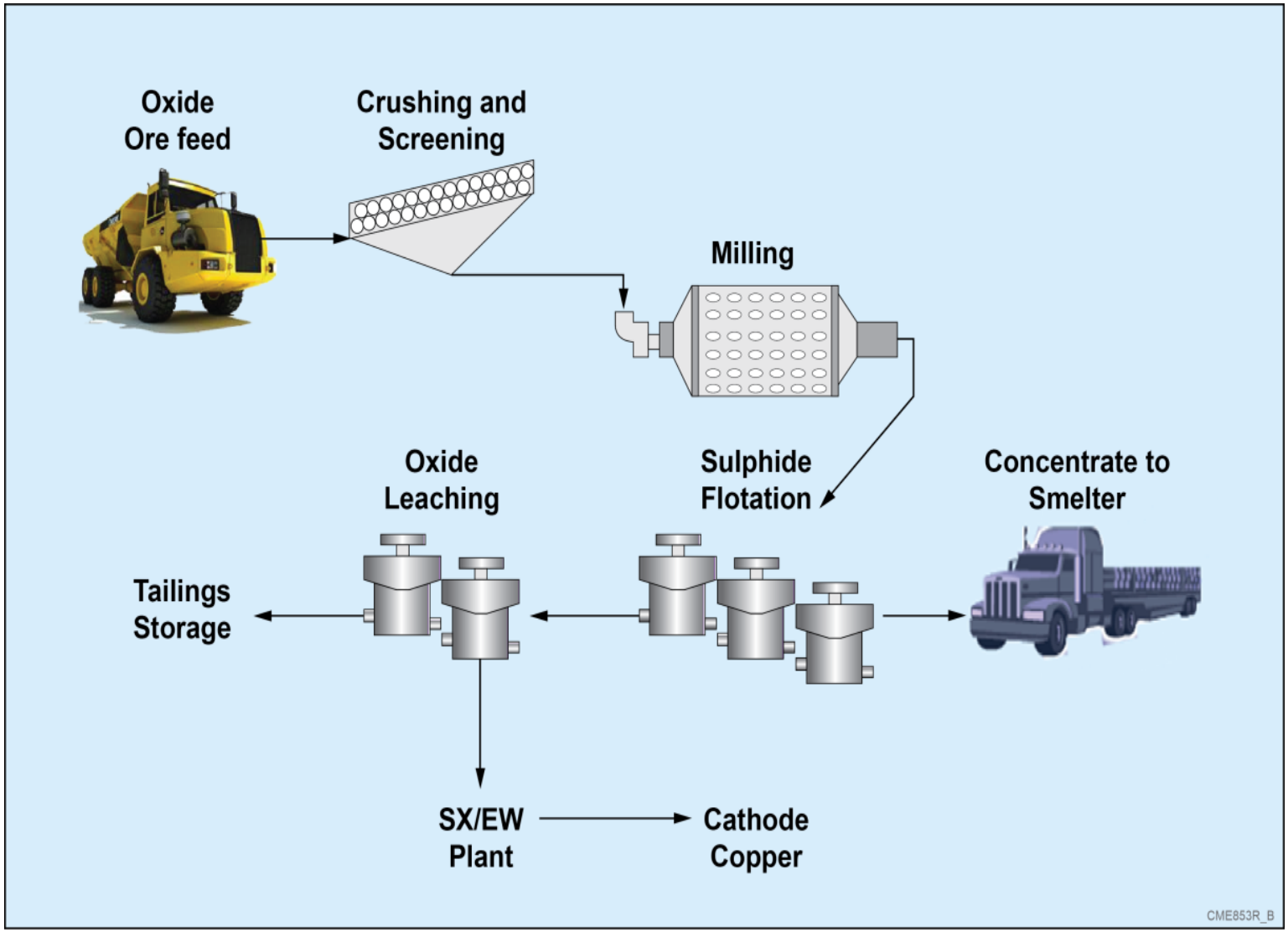
- **Chalcocite: Flotation → copper concentrate**
- **Oxide copper: Acid leach – solvent extraction – electrowinning**

→ cathode copper (at least 99.9% Cu)

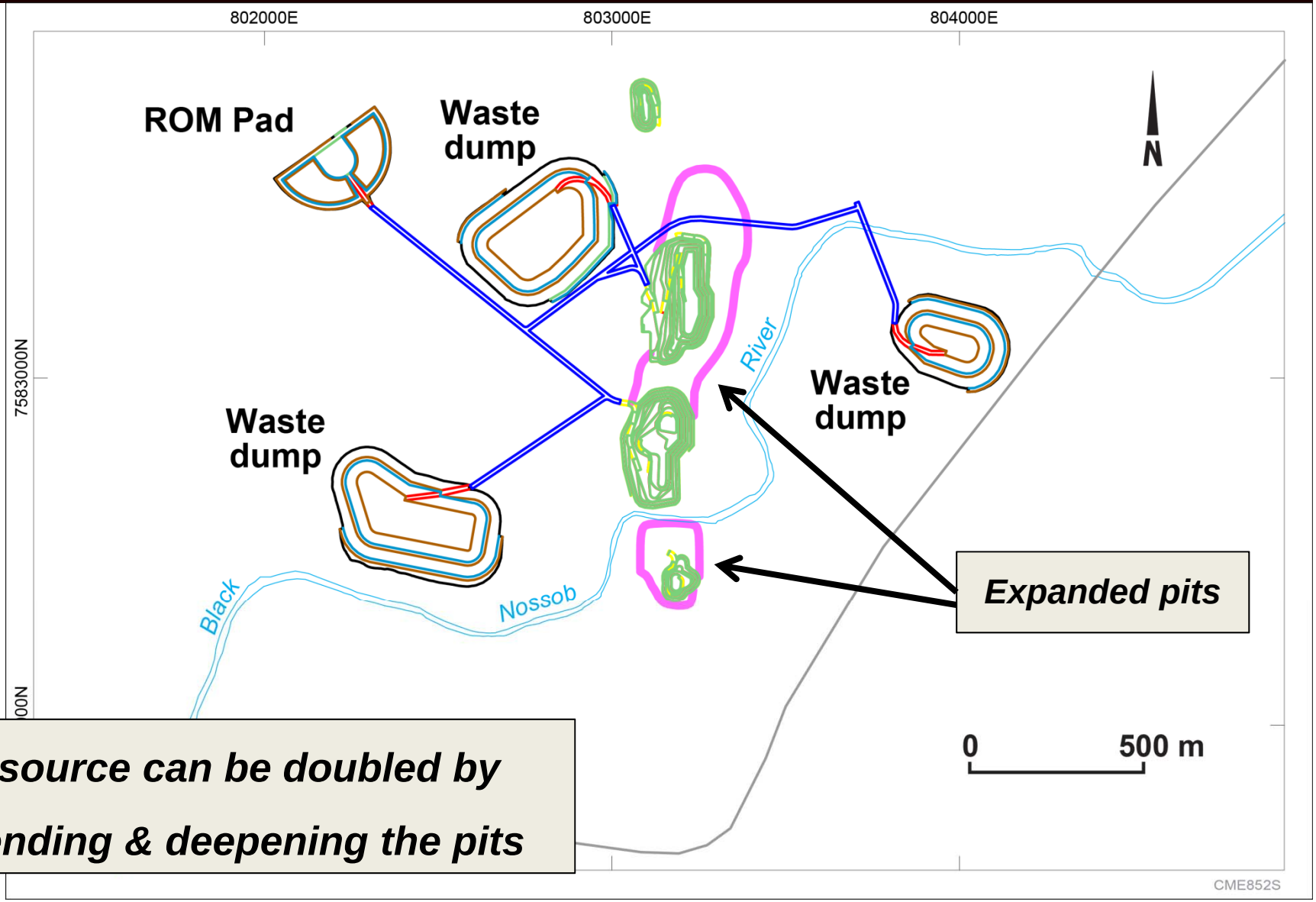
- **Copper produced: 25,570 tonnes**



Phase 1 project: flow sheet

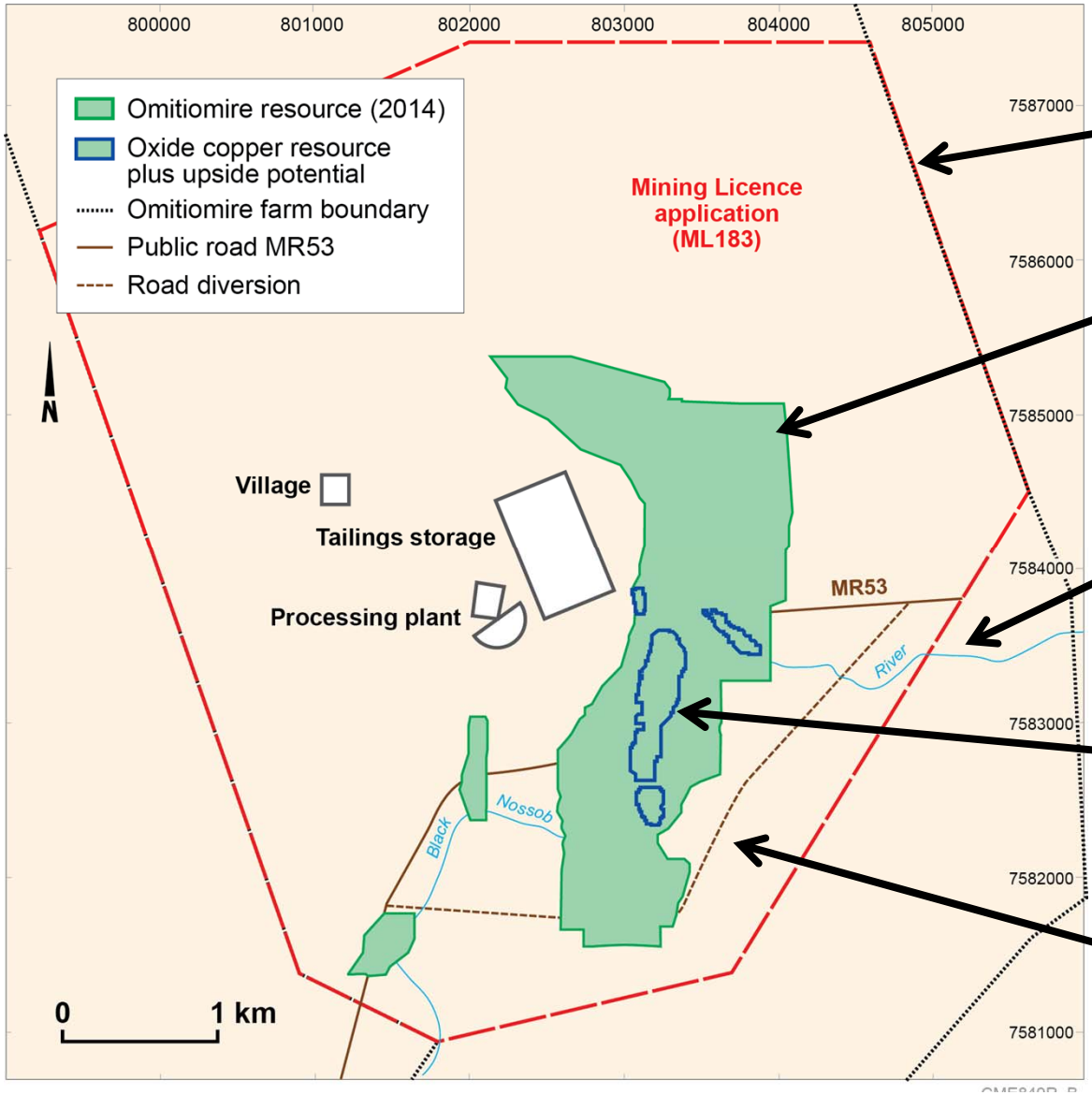


Phase 1 project - upside potential



Resource can be doubled by extending & deepening the pits

Site layout



Farm boundary

Omitiomire resource

Don't move the river

Expanded pits

Road diversion

Definitive feasibility study

- A financially viable project
- Upside potential identified
- Main sensitivities: copper price and exchange rate
- No major environmental issues

Social & environmental impact assessment (SEIA)

Specialist studies -

Surface & groundwater	**Traffic**	**Biodiversity**
Air quality	**Noise**	**Archaeology**
Social / economic	**Visual**	**Soils**

Environmental management plan

- **The EMP is a legal commitment for sound environmental practice**
- **Procedures & policies**

→ **Prevent pollution & limit damage**

- **Induction, training & awareness**
- **Stakeholder engagement**

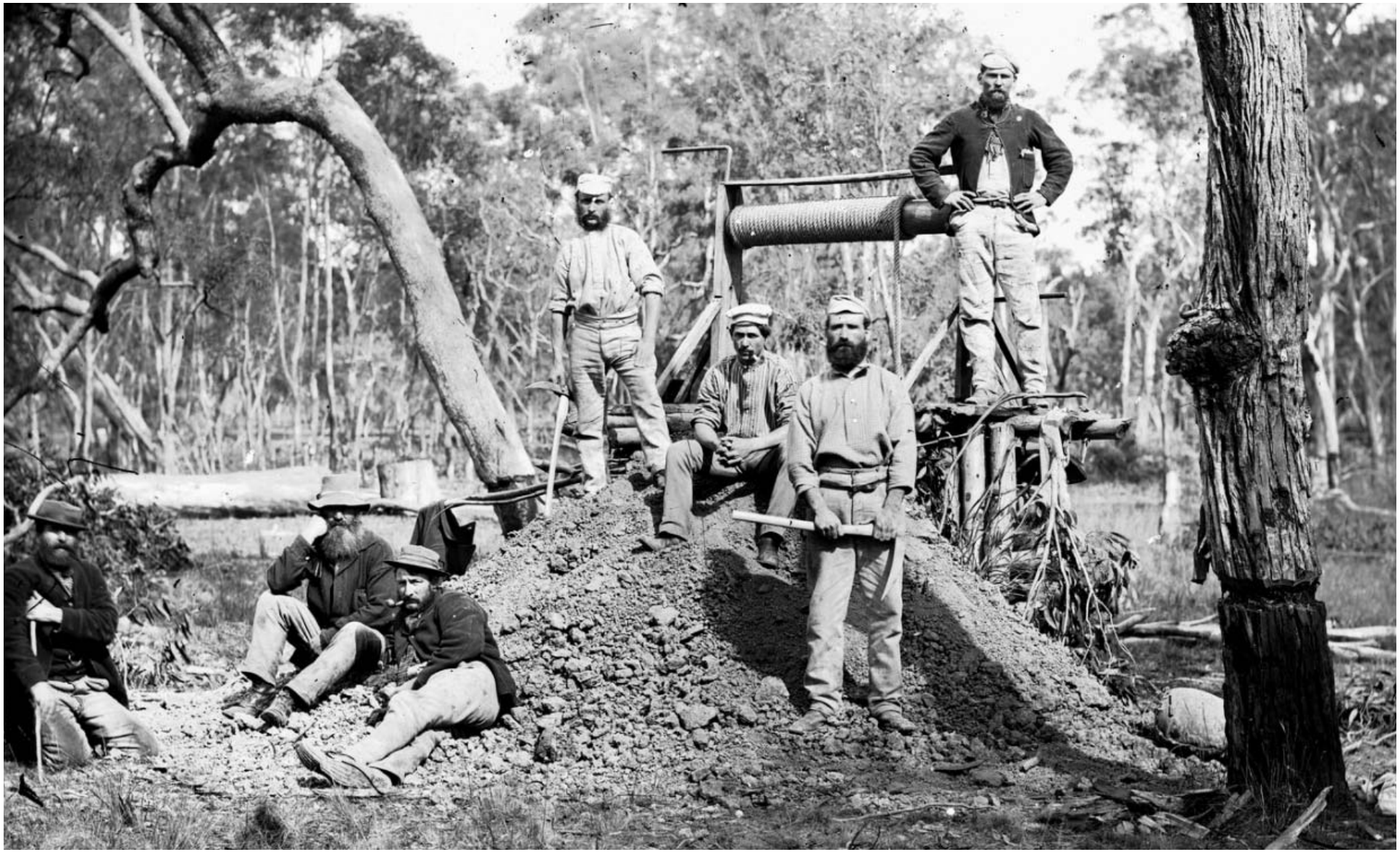
Clean up your mess

Public participation meetings

Phase 1 project

- **Steering Committee recommended proceeding to development**
- **Craton Board recommended proceeding**
- **IBML Board accepted Craton Board recommendation**

Moving towards project development



Mining licence application 13 Dec 2013

Current status

- **Mining Licence application lodged**
- **Environmental Management Plan lodged**
- **Project Manager appointed**
- **Implementation team being appointed**
- **Non-executive directors appointed to Board of subsidiary company**

Elias Shikongo

Principal Partner,

Shikongo Law Chamber

Luo Zhehong

Chairman & MD,

Qinghai West Resources

Craton Board

Non-executive Directors

Otto Shikongo

CEO

Debmarine Namibia

Purvance Heuer

Head of Corporate Finance

Simonis Storm Securities

Strategic planning - Feb 2014

Short-term objectives

- **Obtain a Mining Licence**
- **Obtain environmental clearance**
- **Secure long-term surface access**
- **Resolve other outstanding issues**

Company strategy

- **Construct & operate the Omitiomire oxide copper project**
- **Expand copper resources within trucking distance of Omitiomire**
- **Complete a Definitive Feasibility Study for the larger Phase 2 project**
- **List IBML on an appropriate securities exchange**

A big “thank-you” to our financial backers