

OMITIOMIRE COPPER DEPOSIT, NAMIBIA:

A CASE HISTORY



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Outline

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INTERNATIONAL BASE METALS LIMITED

- **Introduction - Getting Started**
- **Geological Setting**
- **Understanding the Geology**
- **Expanding the Resource**
- **Creating a Viable Project**
- **Discovery Potential**

Why Namibia?

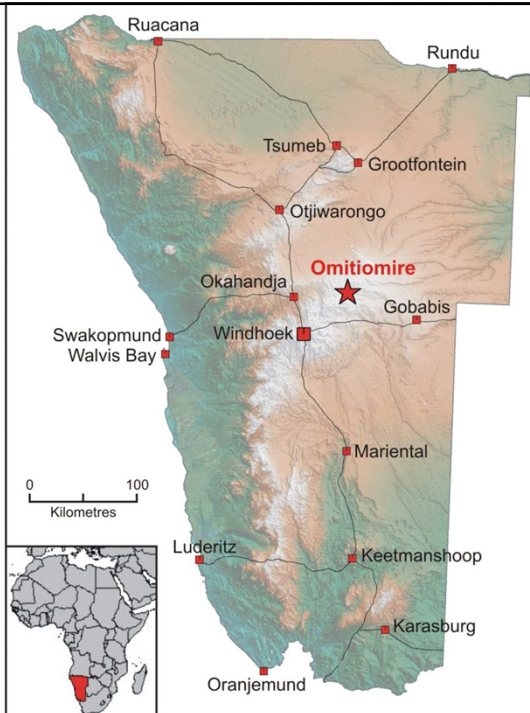
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- Low political risk
- Developed mining industry
- Under-explored base metal trends
- Good infrastructure
- Effective mining & taxation legislation
- Security of tenure
- Full convertibility for foreign investment
- Good exploration & mining support

Getting started

- **Namibian subsidiary -**
Craton Mining and
Exploration (Pty) Ltd
- **Office in Windhoek -**
 - **Exploration manager**
 - **Admin manager**
 - **5 geologists**
 - **Support staff**
 - **Field teams**
- **Craton Foundation -**
 - **Established to provide**
funds for education



Getting started

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- **Feb 2007** **JV agreement with Cheetah Minerals
(subsidiary of Manica Minerals)**
- **Apr 2007** **Tenements granted**
- **May 2007** **Ground magnetic survey**
- **May 2007** **Assessment of pre-Craton drilling**
- **July 2007** **Exploration manager appointed**
- **Aug 2007** **First drill hole**
- **May 2008** **JV converted to equity in IBML**

Geological setting - summary

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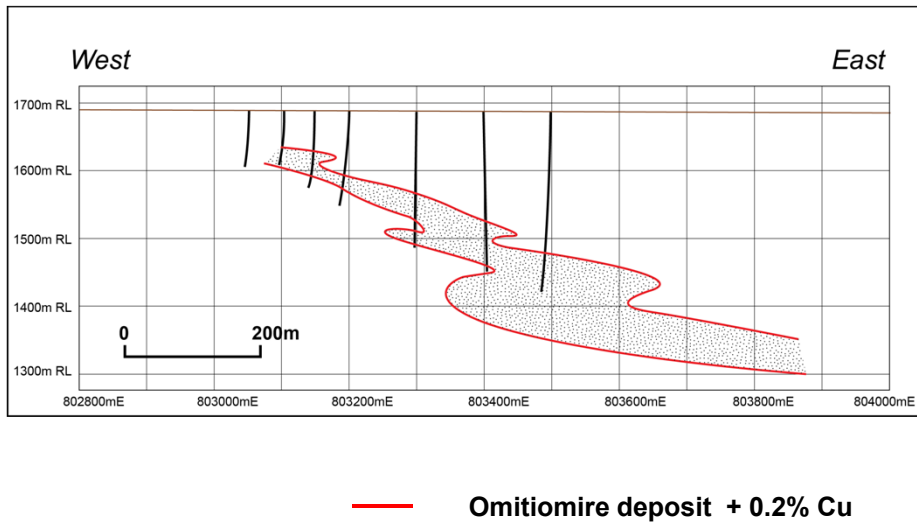
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- **Mesoproterozoic (~ 1100 Ma) basement dome**
- **Basic meta-volcanics (amphibolite & biotite-amphibole schist),
felsic meta-volcanics (felsic gneiss) & intrusive tonalite sheets**
- **Bounded by thrusts related to Pan-African (Cambrian) collision of
Congo & Kalahari Cratons**
- **Flanked by Damara Sequence (Neoproterozoic)**

Geological interpretation - Section 3970N

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Geology - summary

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- Barren hanging wall felsic gneiss
 - Sheared contact with underlying mineralised zone
 - Highest copper immediately below hanging wall contact
 - Recumbent folds repeat mineralised zone at depth
 - Coarse-grained chalcocite cross-cuts foliation
 - Chalcocite associated with post-cleavage biotite & epidote, plus minor sphene & fuchsite
- Remobilisation of copper in late Damaran orogeny
- OR Emplacement of copper in late Damaran orogeny

Mineralogy - summary

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- Sulphide mineralogy dominated by chalcocite - digenite
- Minor bornite, rare chalcopyrite, no pyrite
- Poorly-developed supergene zone with covellite & native copper
- Oxidised to ~ 40m depth -
 - sulphides → malachite & chrysocolla
 - magnetite → iron oxides

Drill planning

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- Soil geochem** - Outlined north-trending deposit
- I.P.** - Farm fences interfere with I.P. survey
- No significant conductivity differences
- Magnetics** - Response similar to unmineralised tonalite
- Grid drilling** - Up to 4 RC rigs & 2 diamond rigs
- 100m x 100m step-out drilling
 - Inferred Resource over 2500m x 700m
 - 50m x 50m infill drilling
 - Indicated Resource in shallow southern area

Resource estimation

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- Consultant's assessment of pre-Craton data in May 2007
- Periodic transfer of data to consultant from Nov 2007
- Consultant's site visit in 2008 - Check on procedures & QC
- Ongoing close collaboration between consultant & Craton staff
- Resource estimations in 2008 & 2010
- Addition of sulphide ratio (S_Ratio) and bandedness (DRUC)
- Two resource estimations -
 - (a) Whole blocks
 - (b) Blocks cut by ore zone outlines

Resource estimation 2010

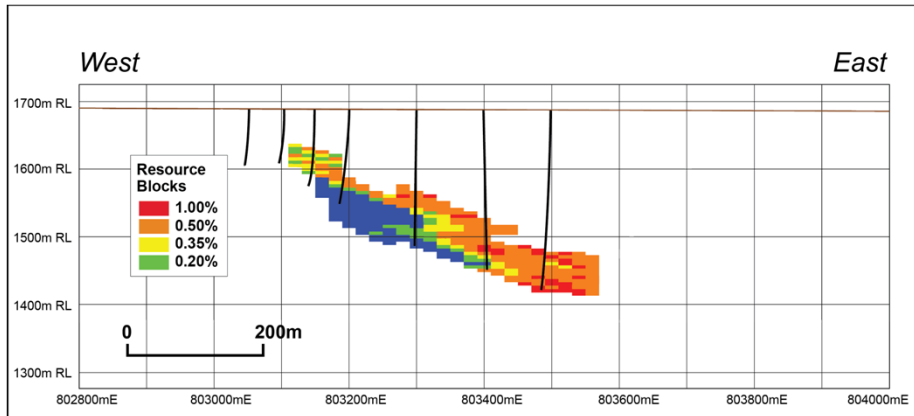
| Cut Off | Ore (Mt) | Cu% | Cu (t) |
|---------|----------|------|---------|
| 0.10 | 240 | 0.31 | 753 000 |
| 0.20 | 143 | 0.45 | 638 000 |
| 0.25 | 117 | 0.50 | 579 000 |
| 0.35 | 74 | 0.61 | 453 000 |
| 0.45 | 50 | 0.71 | 356 000 |

Approx 20% Indicated, 80% Inferred

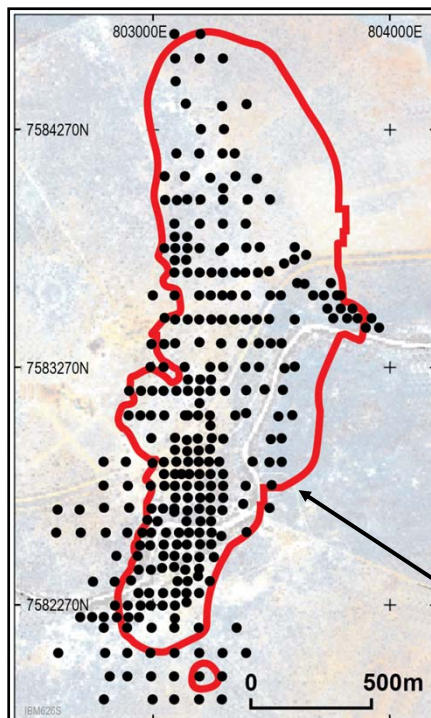
Resource blocks

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Blocks confirmed by close-spaced (25m) drilling in two areas



Drilling Summary

- 305 holes, total > 50,000m
- Deposit covers 2,600m x 700m
- Stratabound body, 10 – 80m thick
- Deposit dips east
- Grade & thickness increase to east
- Depth > 250m at eastern edge
- Remains open at depth to east

Pre-feasibility study pit outline



Sawn drill core

Pre-concentration

- Deposit banded - centimetres to metres in thickness
- Copper in mafic schist bands - soft ($< 150 \text{ MPa}$) & heavy ($> 2.8 \text{ g/cm}^3$)
- Felsic gneiss bands barren - hard ($> 200 \text{ MPa}$) & light ($< 2.8 \text{ g/cm}^3$)

→ Cheap & effective pre-concentration by dense medium separation (DMS)

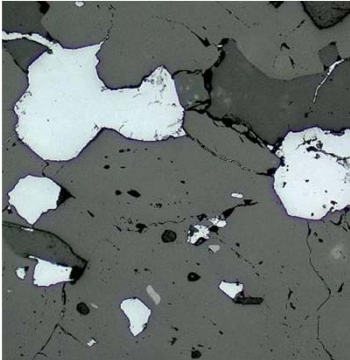
This process doubles the grade of mill feed to ~ 1% Cu

Mineralogy & flotation

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- Mainly coarse chalcocite (Cu_2S) with minor bornite (Cu_5FeS_4)
- Partly oxidised to 40m depth
- 90% sulphide copper recovery
63% oxide copper recovery
- Sulphide flotation
+50% Cu concentrate
no deleterious elements (As Bi etc)



500 μm

Pre-feasibility study at US\$2.50 /lb

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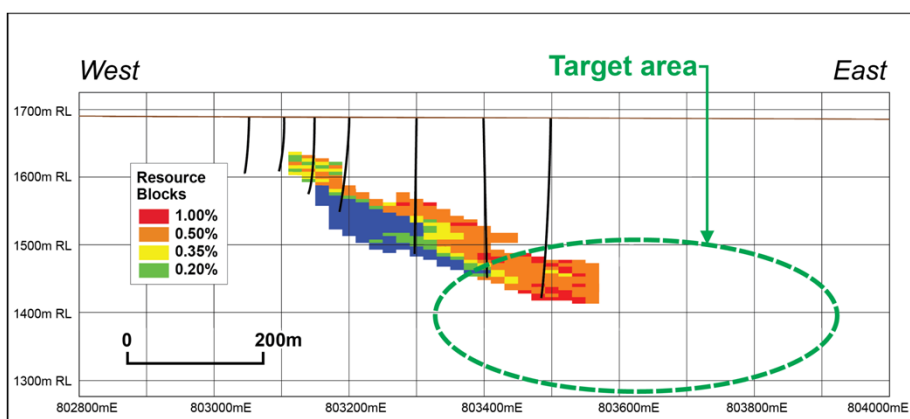
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| Item | Parameter |
|---------------------------------|--|
| Total crusher feed | 69 Mt at 0.55% Cu |
| Waste to ore ratio | 5 - 6:1 |
| Crusher feed | 6 Mtpa |
| Processing | Crush, dense medium separation (DMS), grind, flotation |
| Mill feed | 3.45 Mt at 1% Cu |
| Overall Recovery | Sulphides – 90%, oxides – 63% |
| Concentrate | 30,000 – 36,000 tpa Cu in concentrate at + 50% Cu |
| Capex (incl mining) | US\$297 Million |
| Opex (before royalties & taxes) | US\$1.30 – 1.65/lb |

Down-dip extension

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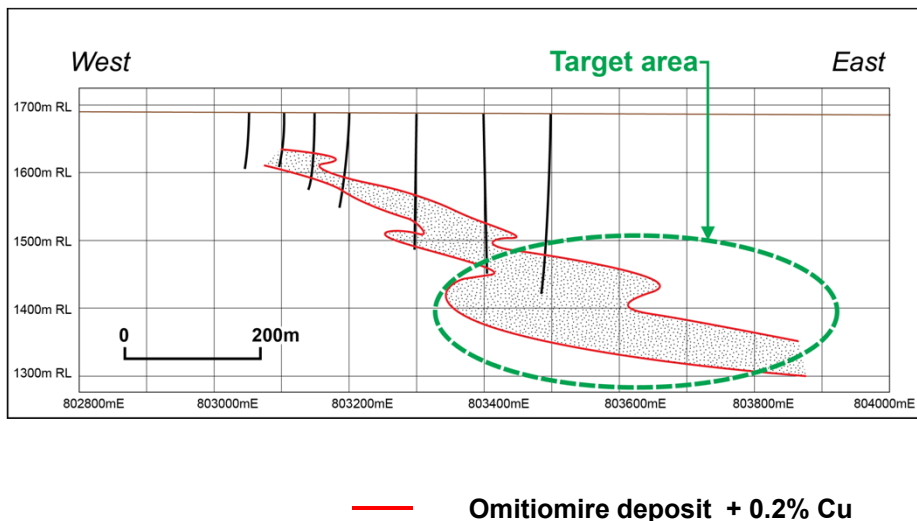


Resource blocks - Section 3970N

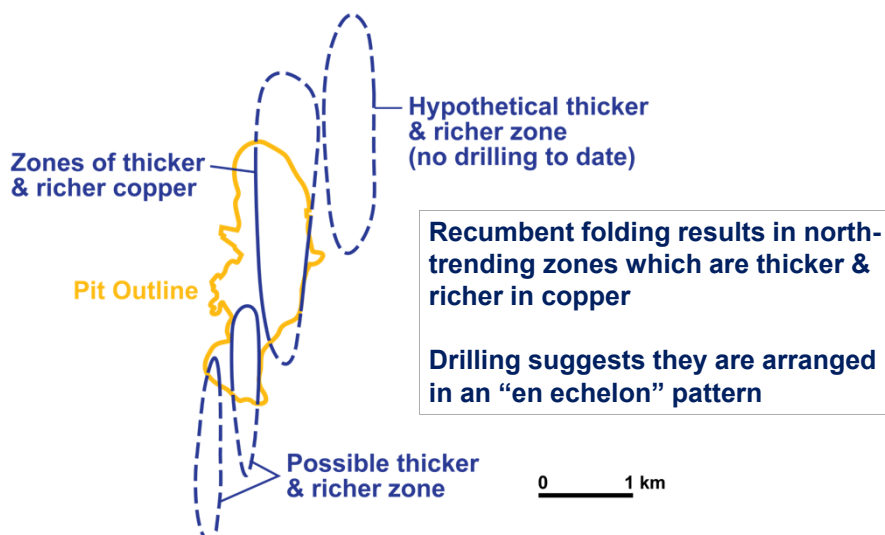
Down-dip extension - Section 3970N

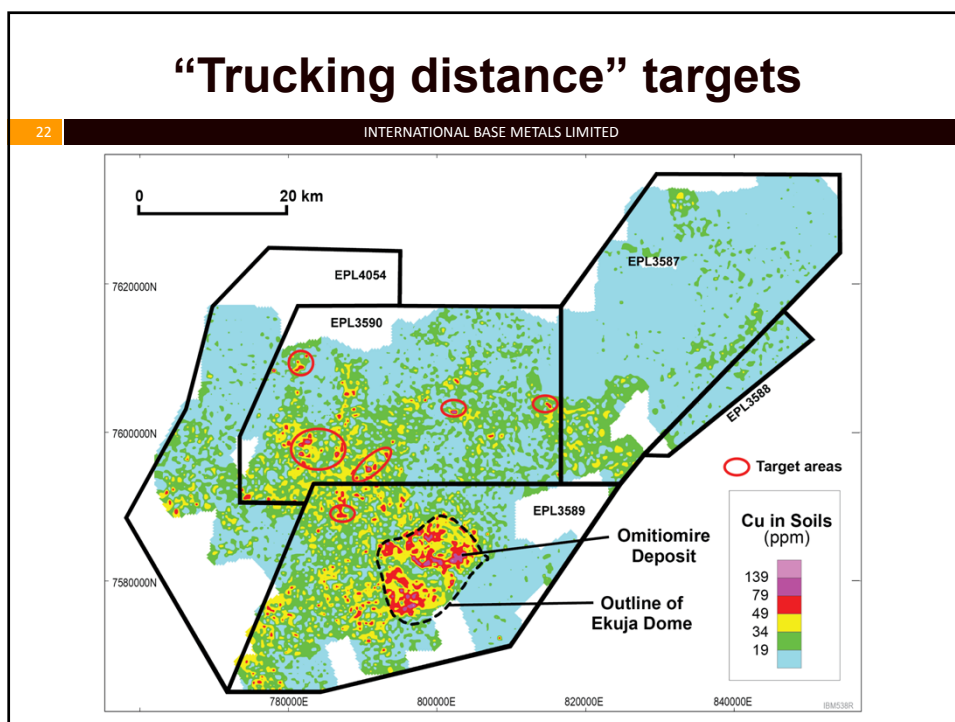
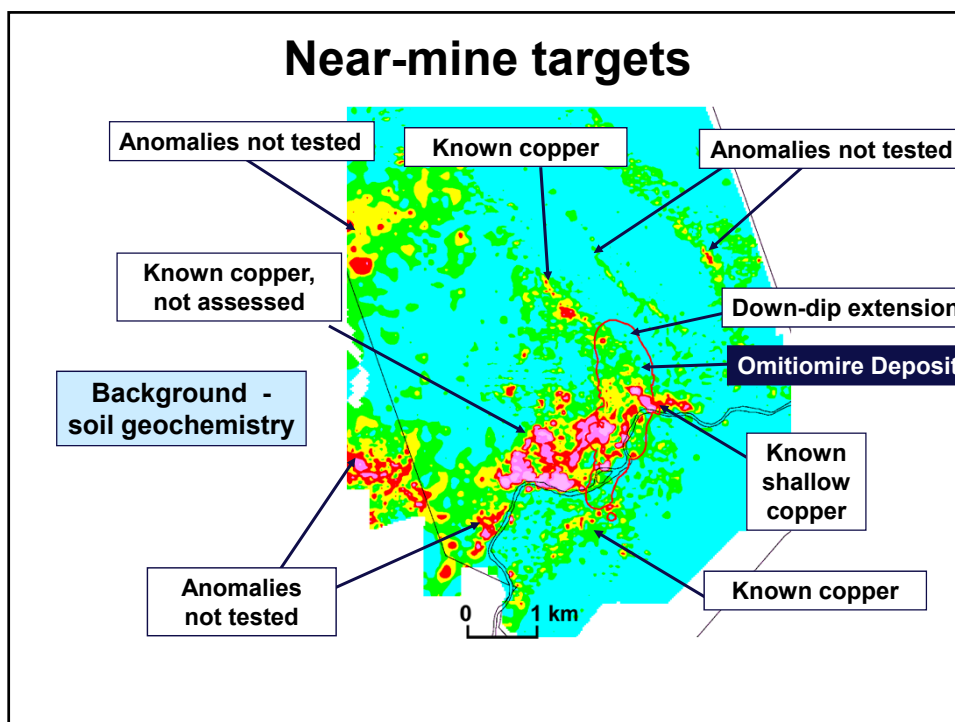
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Omitiomire project - summary

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- **Tabular body, 10 – 80m thick, shallow dip**
- **Allows large-scale open-cut mining**
- **Substantial resource - over 600,000 tonnes contained copper**
- **Excellent potential to expand resource to + 1 million tonnes copper**
- **Process for cheap effective pre-concentration to ~ 1% Cu mill feed**
- **Mainly chalcocite (Cu_2S – 79% Cu) → concentrate grade + 50% Cu**
- **Clean concentrate - no deleterious elements (arsenic, etc)**
- **Accessible to grid power & water**
- **No significant environmental issues**