



ALKANE EXPLORATION LTD

ABN 35 000 689 216

DUBBO ZIRCONIA PROJECT

**New South Wales
Australia**

Hargreave Hale Ltd and LM Associates - European Mining Conference January 2005



ALKANE EXPLORATION LTD

ABN 35 000 689 216

Alkane is listed on the Australian Stock Exchange (ASX) - ALK

A diverse exploration and mining company active in the Central West Region of New South Wales, Australia

Produced 152,000 ounces of gold from its Peak Hill mine

A new discovery of 500,000 ounces of gold nearby

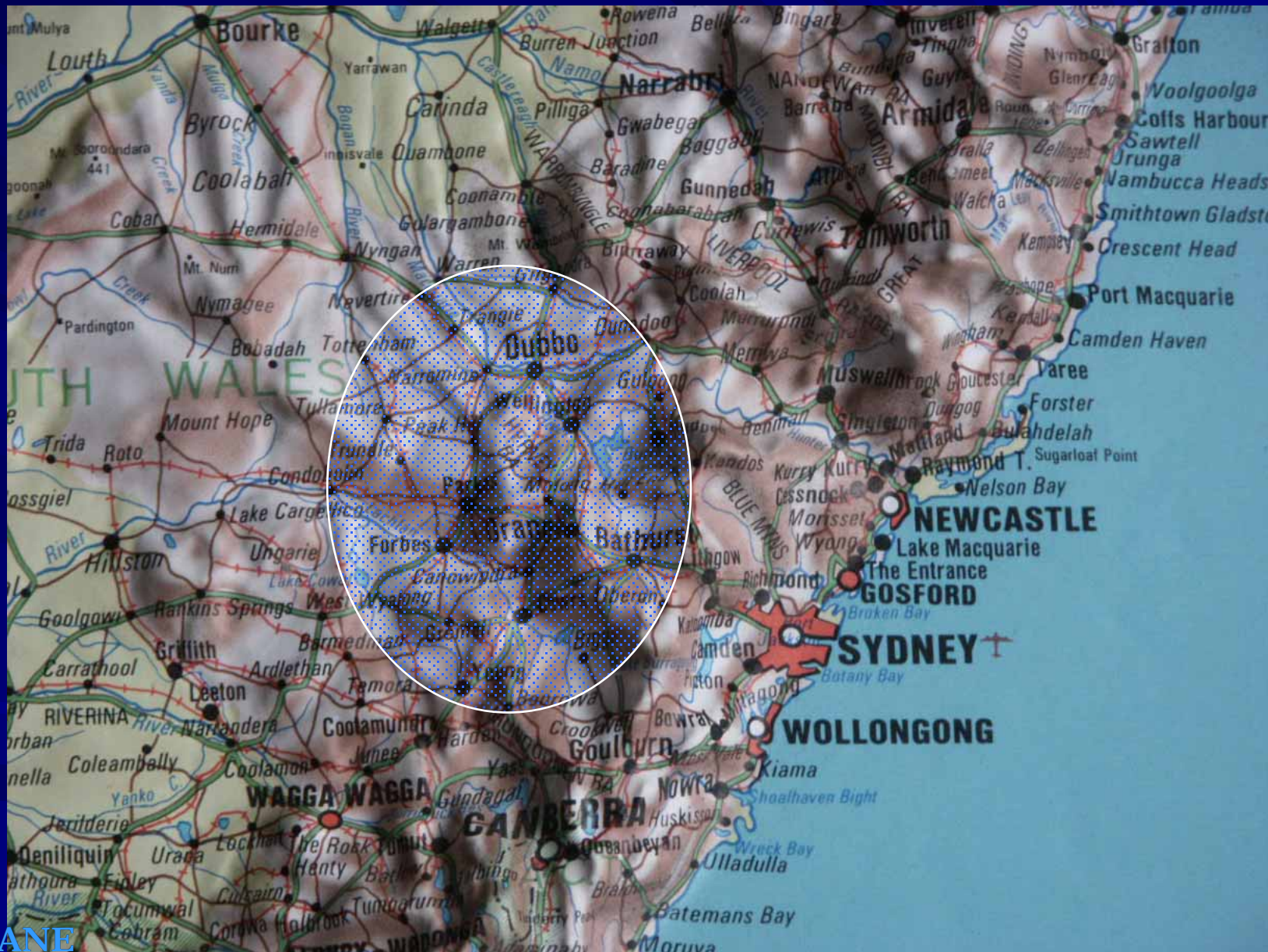
World class zirconium-niobium-tantalum resource at Dubbo



CORPORATE PROFILE

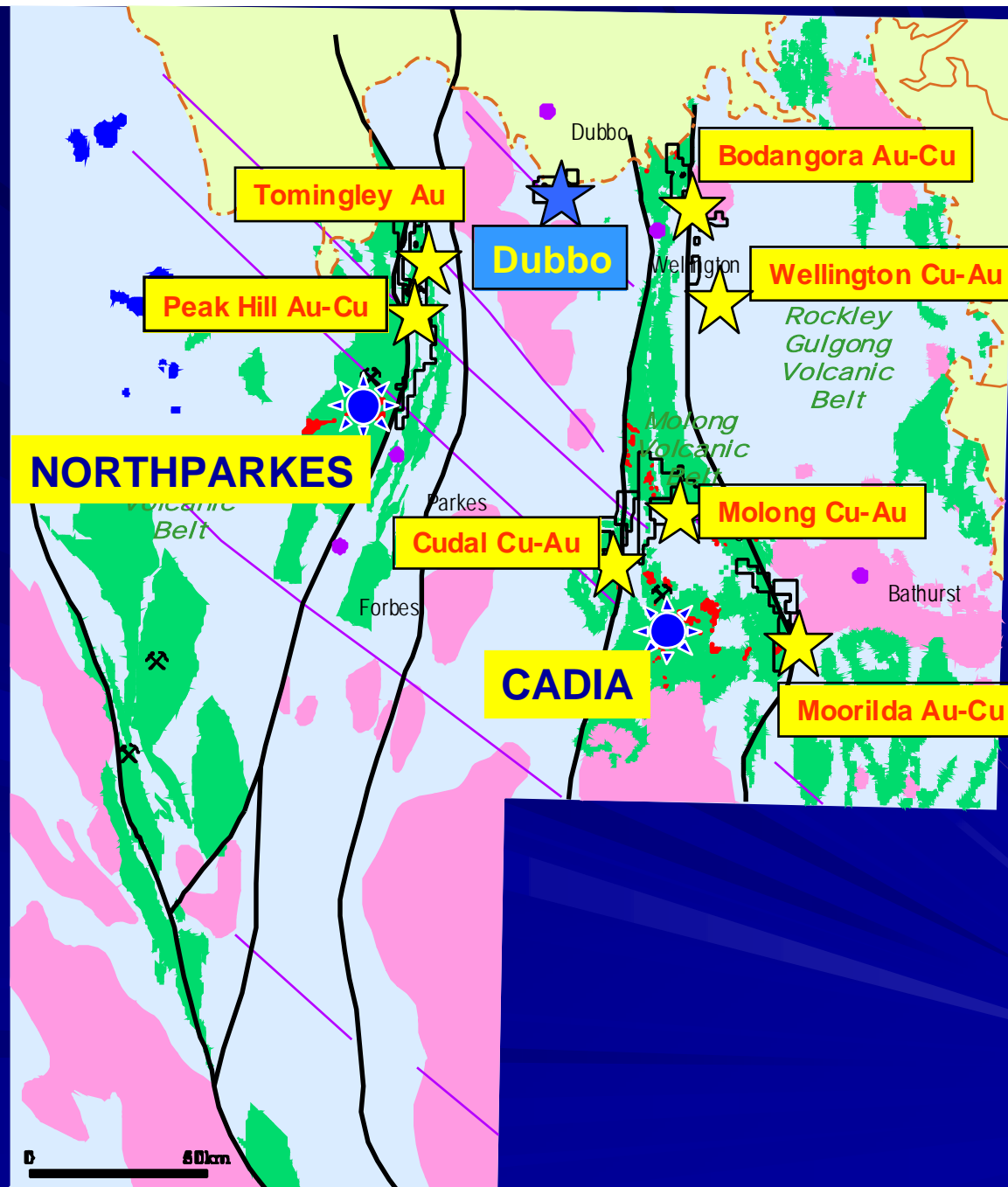
- **ASX Code** ALK (listed since 1969)
- **Issued Capital** 138m shares
9.8m listed opts / 9.2m unlisted
- **Cash** A\$1.0m
- **Trading Range 04** A\$0.17 - \$0.39
- **Current Market Cap** A\$30m
- **No Debt**

Central West - New South Wales



Central West NSW Projects

-  Younger granites
-  Monzonitic intrusions
-  Ordovician arc volcanics
-  Fifield complexes



PEAK HILL GOLD MINE

**Conventional Open Cut Mining
Agglomeration Heap Leach
recovery of gold**

**Production Commenced 1996
at Capital Cost \$5 million**

**1996-2004 Output 152,000 ounces
Cash Operating Surplus \$15 million**

**100,000-500,000 ounces in sulphide
deposit from 100m to 300m
moderately refractory ore
– subject on-going review**



PEAK HILL GOLD MINE



TOMINGLEY GOLD PROJECT

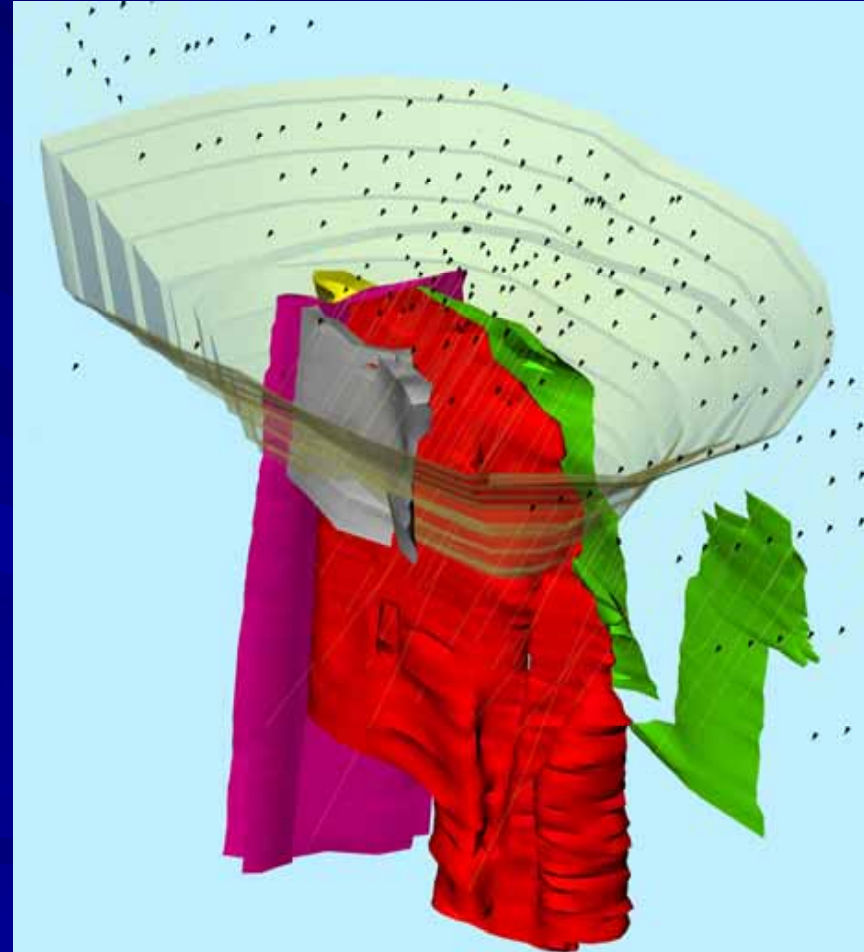
Wyoming One and Three Deposits

14km north of Peak Hill, discovered in 2001, drilled during 2002-2003

Total resources currently stand at 500,000 ounces of gold

Further recent drilling continues to generate very positive results

Feasibility study in progress for open pit/underground mine for development later 2005



DUBBO ZIRCONIA PROJECT

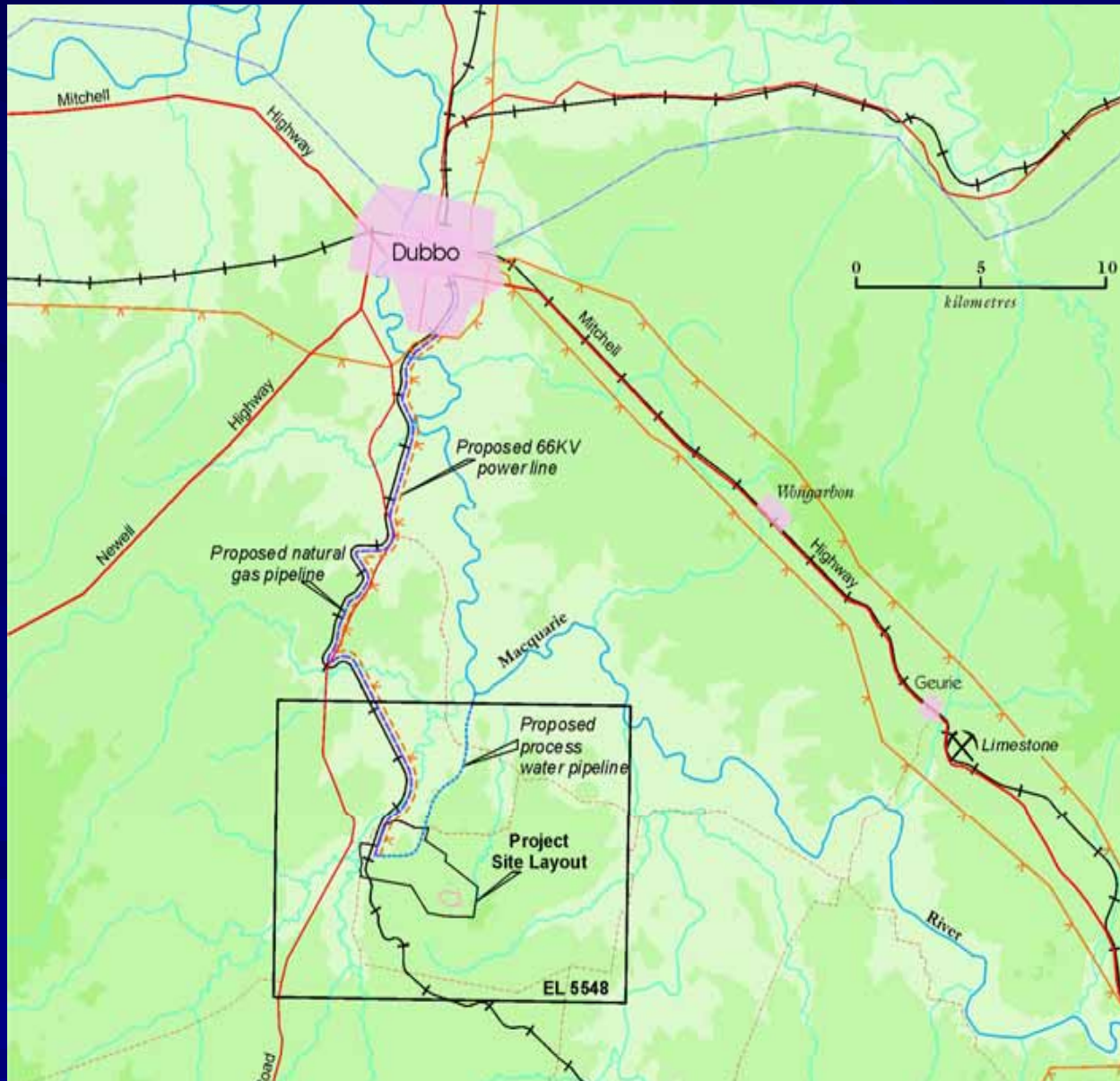
SUMMARY

- One of the worlds largest **zirconium**, **yttrium** and **tantalum** resources (+ 100 million tonnes) - also contains significant **niobium** and **rare earth elements**
- Project based upon large Jurassic aged alkaline volcanic complex with highly metal enriched vertical trachyte intrusive
- Feasibility study to produce high quality zirconia-zirconium chemicals; niobium-tantalum concentrate and a yttrium-rare earth concentrate

• Zirconium metal Zr	zirconia (hafnia)	ZrO ₂ (+HfO ₂)
• Niobium metal Nb	niobium pentoxide	Nb ₂ O ₅
• Tantalum metal Ta	tantalum pentoxide	Ta ₂ O ₅
• Yttrium metal Y	yttria	Y ₂ O ₃
• Rare earth elements - REE	rare earth oxides	REO's

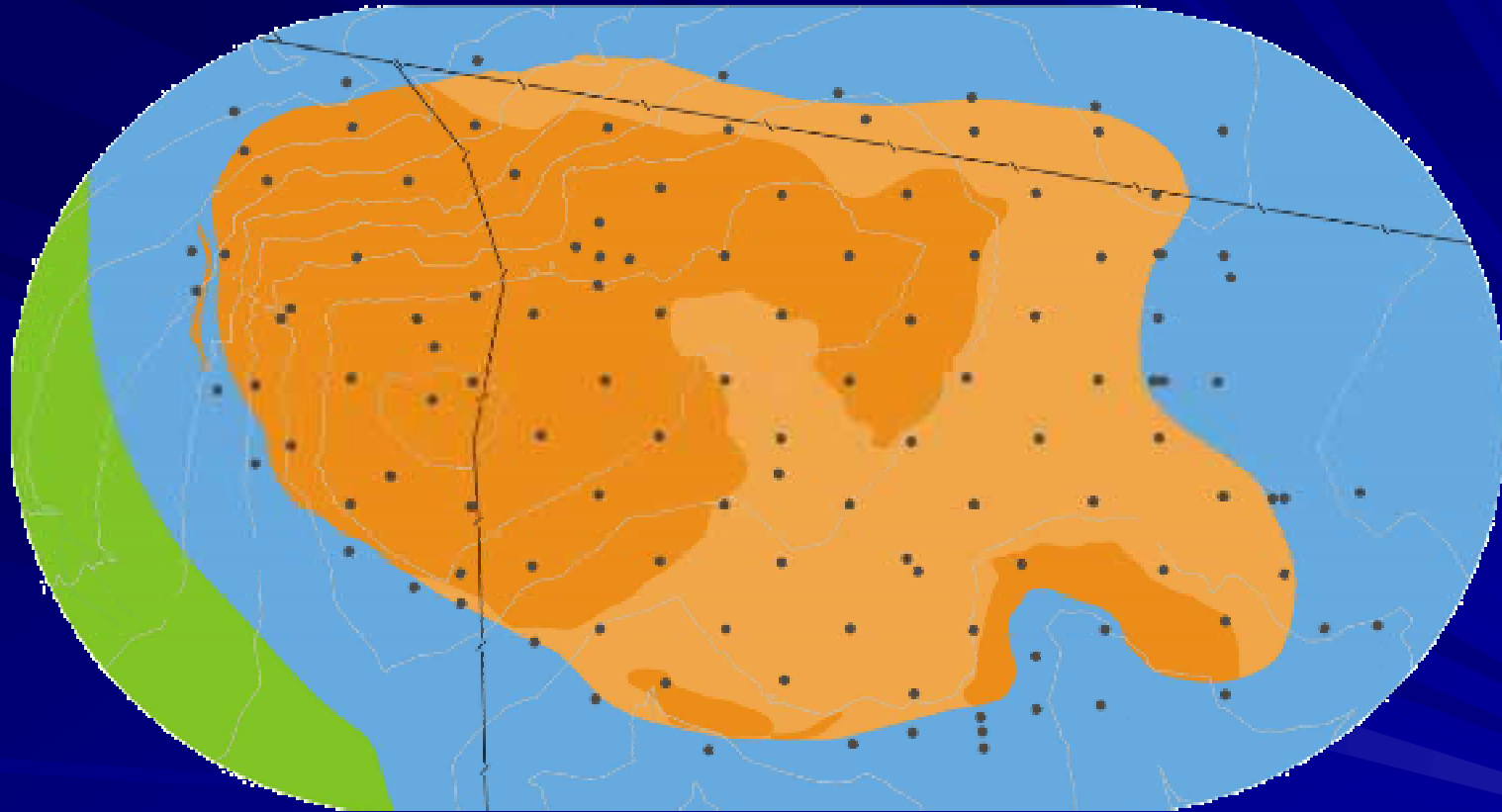
DUBBO ZIRCONIA PROJECT

Project Site and Infrastructure Location



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Geology



0 200
metres

DUBBO ZIRCONIA PROJECT

View over Toongi deposit

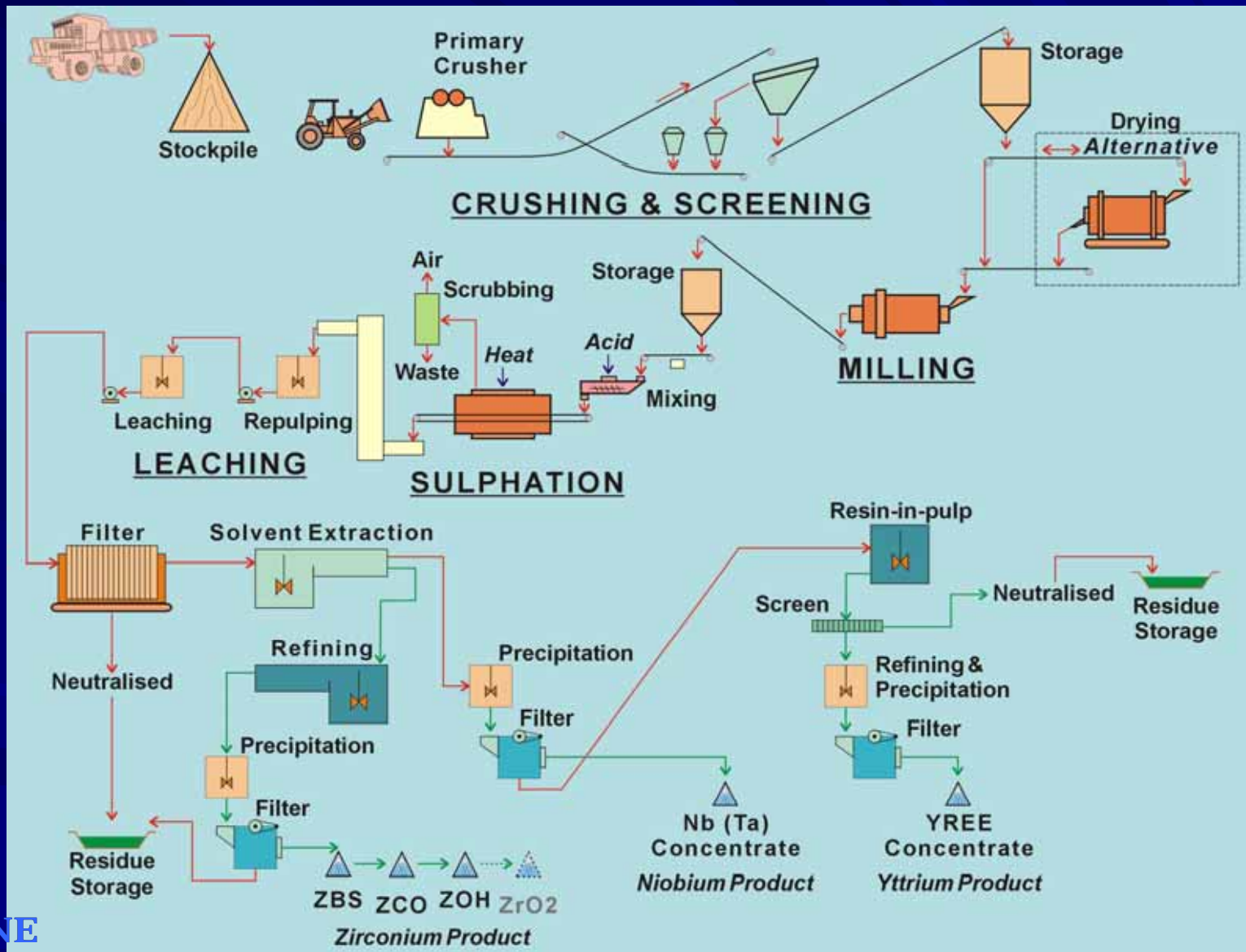


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RESOURCES

Measured Resource 0 - 55 metres	:	35.7 million tonnes grading 1.96% ZrO₂, 0.04% HfO₂, 0.14% Y₂O₃ 0.46% Nb₂O₅, 0.03% Ta₂O₅ and 0.75% REO
Inferred Resource 55 - 100 metres	:	37.5 million tonnes at similar grades
TOTAL	:	73.2 million tonnes

DUBBO ZIRCONIA PROJECT PROCESS FLOW SHEET



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Mini Pilot Plant - Roaster



DUBBO ZIRCONIA PROJECT

Mini Pilot Plant - SX Circuit



DUBBO ZIRCONIA PROJECT

INDICATIVE DEVELOPMENT

Conceptual Project at start up 200,000tpa ore processed

Zirconium products

3000 tpa zirconia ($ZrO_2 + HfO_2$) equivalent

ZBS Zirconium basic sulphate

ZOH Zirconium hydroxide

ZCO Zirconium carbonate

ZrO Zirconia (calcined)

Niobium - tantalum
products

600 tpa niobium (+Ta) concentrate
niobium pentoxide ($Nb_2O_5 + Ta_2O_5$)

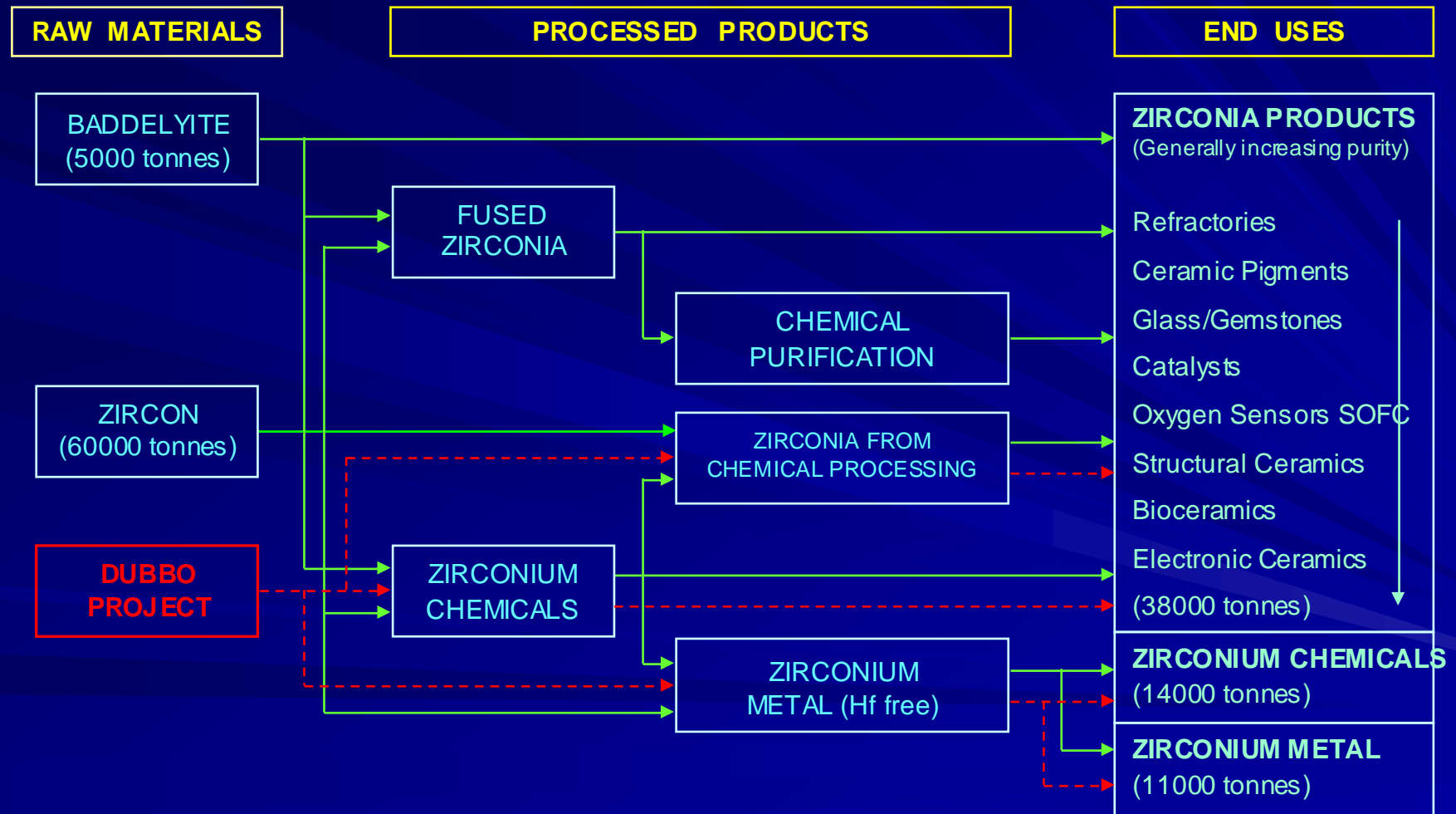
Yttrium - rare earth
products

1200 tpa yttria - rare earth concentrate
yttria and rare earth oxides ($Y_2O_3 + REO$)

**PROJECT LIFE + 250
YEARS**

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Structure of the Zirconia Industry



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Niobium - Tantalum Market

Niobium 1991 - 19,000t 2003 - 32,600t 90% Brazil

Uses: 90% HSLA Steels

Other: Superalloys - aerospace and gas turbines
Optical glass, ceramic capacitors,
superconductors (MRI etc)

Tantalum 1991 - 625t 2003 - 1,500t 30% W.A.

Uses: 60% Electronics -- ceramic capacitors

Other: Superalloys - turbines
hard tools, Ta chemicals

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Yttrium - Rare Earth Market

Y/REE's

1991 - 30,000t 2003 - ~100,000t

China 80%

Catalyst/Chemicals

30%

- auto and petroleum, fertilisers

Metallurgical

35%

- hsla steels, alloys, batteries

Glass/Ceramics

15%

- specialty glasses, stabilized zirconias, pigments

Electronics/Magnets

20%

- phosphors, permanent magnets, lasers

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Possible future advancements

Resource size would enable significant scale up from base case 200,000tpa to 500,000tpa or larger

Annual revenue stream increased from US\$25m to US\$60-80m by scale up

Addition revenue increase by improved (quality) base case products

Production of separated products:

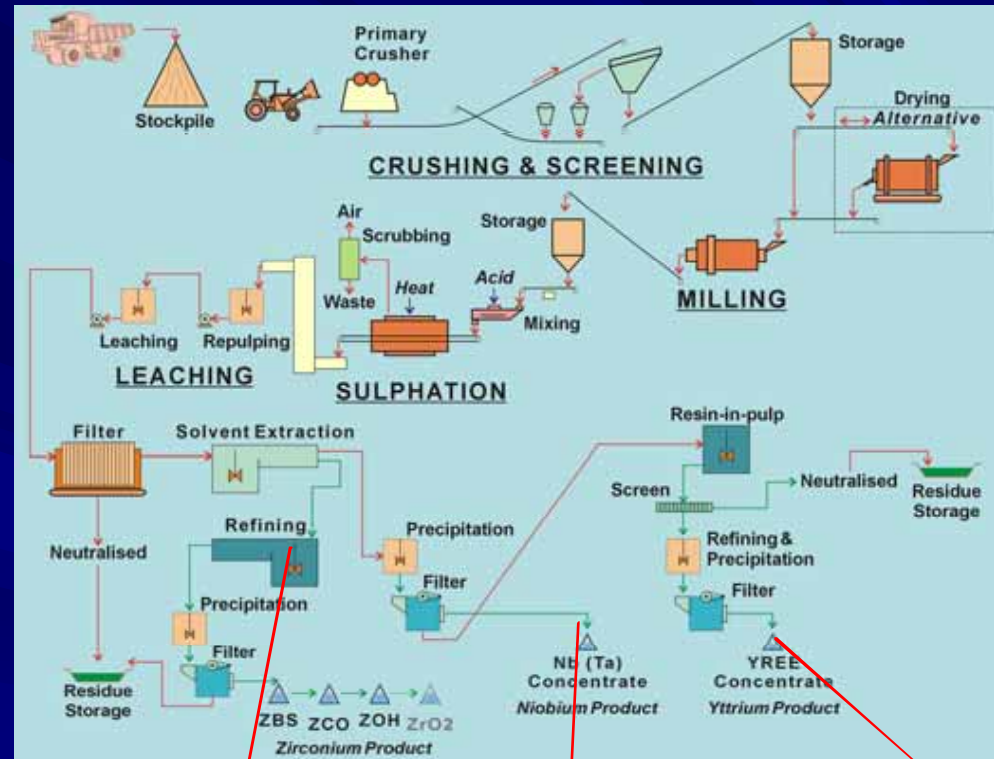
Zirconium and hafnium

Niobium from tantalum

Yttrium from heavy rare earths

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Process Flow Sheet – Possible developments



Zirconium and hafnium metal

Separated niobium and tantalum

Separated yttrium and HREE's

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Possible future developments in zirconium stream

Separation of zirconium and hafnium to prepare various metal products:

ZIRCONIUM: sponge (~US\$20-25/kg)
→ metal (~US\$200-250/kg)

Major uses: cladding in nuclear power plants, corrosion resistant piping, special alloys

HAFNIUM: metal (US\$? kg)

Major uses: control rods in nuclear reactors

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Preliminary Plant Layout



0 100
metres

Dubbo Zirconia Project

Toongi rail siding and process plant site



Dubbo Zirconia Project

View over project site



DUBBO ZIRCONIA PROJECT

Current Summary

Development joint venture signed with Astron Limited October 2003

Astron is ASX listed with major zirconia, zirconium chemicals production in north east China. Currently produces 25% of world output.

Astron will earn 50% by funding all expenditures including construction and operation of demonstration pilot plant (2005).

Will provide product development technology and existing markets

Will assist to secure development funding

Development decision possibly mid 2006

Our Operations in China



- Group headquarters (Shenyang)
 - Administration
 - Sales and logistics
 - Business development
- Research and development (Bayuchuan)
- Zirconium materials (Bayuchuan and Zibo)
 - Zircon Flour 15000 ton
 - Advanced chemicals 22000 ton
 - Fused Zirconia 13000 ton
- Sales and warehouses (11 Locations across China)



We Are A High Technology Company

- High tech processes
 - Mineral sands separation technology and markets
 - Advanced zirconium chemistry and product applications
 - Fused zirconia processing and product applications
 - Titanium chemistry and products
 - Vacuum furnace processing and products
 - Chemical plant design and construction
- Customized products to suit applications
- Nano materials
- Low cost





World Zirconia and Zirconium Chemical Production Capacity (ZrO₂ Units) '000

	World	Astron	%
Fused Zirconia	50	13	24%
Zr chemical/zirconia	72	10	14%
Total	127	23	18%