



Australian Government

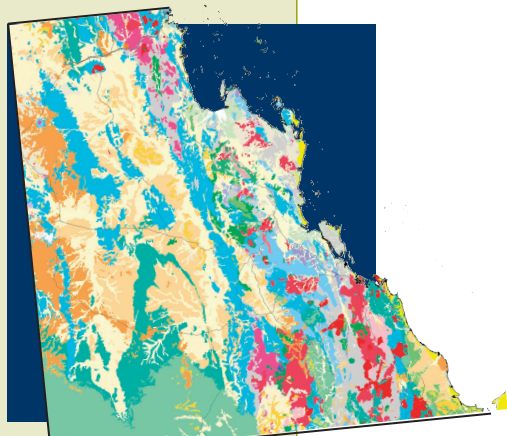
Geoscience Australia

Australian *Mineral* EXPLORATION

FEBRUARY 2006

A REVIEW OF EXPLORATION FOR THE YEAR **2005**

Extended Edition



1:1 million digital geology
of Eastern Australia

OVERVIEW

- Australian mineral exploration spending in 2004-05¹ rose by 31% to \$1028.3 million² of which 39.3% was spent on the search for new deposits³.
- Total global non-ferrous mineral exploration budgets rose 38% to an estimated US\$5.1 billion in 2005.
- Western Australia received 59% of Australian mineral exploration spending in 2004-05 as spending rose in all States except Victoria.
- Gold remained the main target but its share of spending was eroded by increased spending on nickel, copper, iron ore, coal and uranium.
- Exploration resulted in significant increases in resources at known deposits and a substantial number of drill intersections of economic interest.

Exploration REVIEW

Australian mineral exploration expenditure rose by 31% to \$1028.3 million in 2004-05 (year ending 30 June 2005) according to the Australian Bureau of Statistics (ABS). This was the highest annual current dollar expenditure since 1997-98. Building on the 7.4% growth reported in 2003-04, the constant 2004-05 dollar spending rose by 28% (Figure 1) to reach 73% of the 1996-97 peak.

ABS survey data on spending on exploration for new deposits³ showed that, nationally, 39.3% of exploration spending was in that category. Western Australia, at 46.8%, had the highest proportion of exploration for new deposits while Victoria had the lowest at 19.0%. This share of exploration for new deposits is slightly higher than the Metals Economics Group (MEG) world survey of non-ferrous minerals exploration budgets for 2005 which found that 37.0% of exploration budgets in Australia were for grassroots exploration.

Spending increased in all jurisdictions except Victoria where it fell slightly. Western Australia led by attracting \$606 million, an increase of 30% on 2003-04. It was followed by Queensland where spending rose by 32.9% to \$166.4 million and New South Wales where it rose by 45.7% to \$73.6 million. South Australian spending rose by 60.4% to \$66.9 million and the increase in the Northern Territory was 30.8% to \$55.6 million. Spending in Tasmania rose by 10.7% to \$8.5 million but Victorian exploration fell by 3.7% to \$51.5 million.

In 2004-05 ABS reported that exploration drilling totalled 6.78 million metres, an increase of 1.1 million metres (19%) from 2003-04. Of the total, 2.78 million metres (41% of all exploration drilling) was on the search for new deposits a substantially smaller share than the 47% recorded in 2003-04.

¹Australian financial year from 1 July 2004 to 30 June 2005.

²All monetary references in this paper are to Australian dollars unless otherwise stated.

³Exploration spending on the search for new deposits covers exploration for previously unknown mineralisation or exploration on known mineralisation which is not yet classified as a resource.

The MEG survey of world non-ferrous mineral exploration budgets for 2005 reported an increase of 34% to an estimated total budget of US\$5.1 billion based on survey respondent's budgets totalling US\$4.89 billion. Of the respondent's budgets, US\$614.7 million was directed to exploration in Australia the highest since 1998. However, Australia's share of global non-ferrous mineral exploration budgets fell to 12.7%, the lowest yet recorded.

According to the MEG survey, 58.6% of the 2005 exploration budgets for Australian-based companies was for exploration in Australia. The survey included 308 companies with non-ferrous exploration budgets of more than US\$100 000 that were exploring in Australia, an increase of 21 over 2004. Of the total, 37 were overseas based companies, one more than in 2004. Budgets for Australian non-ferrous mineral exploration were directed to gold (US\$331.4 million), base metals (US\$214.1 million) and diamonds (US\$22.5 million).

Some \$177 million was raised for mineral exploration in Australia from 48 initial public offerings on the Australian Stock Exchange in 2005.

GOVERNMENT PROGRAMS

The Australian, State and Northern Territory governments continued active geoscience programs to support mineral exploration with new initiatives and the release of new geoscience data and other products in 2005. Highlights for 2005 included:

Geoscience Australia

- Geoscience Australia released the 1st edition seamless digital 1:1 million geology datasets for New South Wales and Queensland, and 2nd edition digital 1:1 million geology datasets for Tasmania and Victoria. Compilation of data for the Northern Territory and South Australia is in progress.
- Geoscience Australia, in partnership with the Geological Survey of Western Australia, the Northern Territory Geological Survey, Newmont Exploration and Tanami Gold NL, acquired 700 km of deep crustal seismic reflection data in the Tanami gold province to better define the crustal structure and upper crustal geometries of the region. Processing will be completed by early 2006 and interpreted sections by mid-2006.

New South Wales

- The \$30 million, seven year, Exploration NSW Initiative, has covered 80% of New South Wales with high resolution geophysics at 400 m line spacing or better. A major focus of Exploration NSW is now on the 'frontier terranes': the Thomson Fold Belt in the northwest and extensions of the gold-rich Bendigo and Stawell Zones into the State's south.
- Three dimensional modelling of the highly prospective Lachlan Fold Belt is currently being undertaken in collaboration with the Cooperative Research Centre for Predictive Mineral Discovery.

Northern Territory

- Release of 3700 new gravity stations over the northern Tanami Region, acquired on 2 km centres.
- Release of major reports on the gold mineral systems of the Tanami Region, and tin-tantalum pegmatite mineralisation of the Northern Territory.

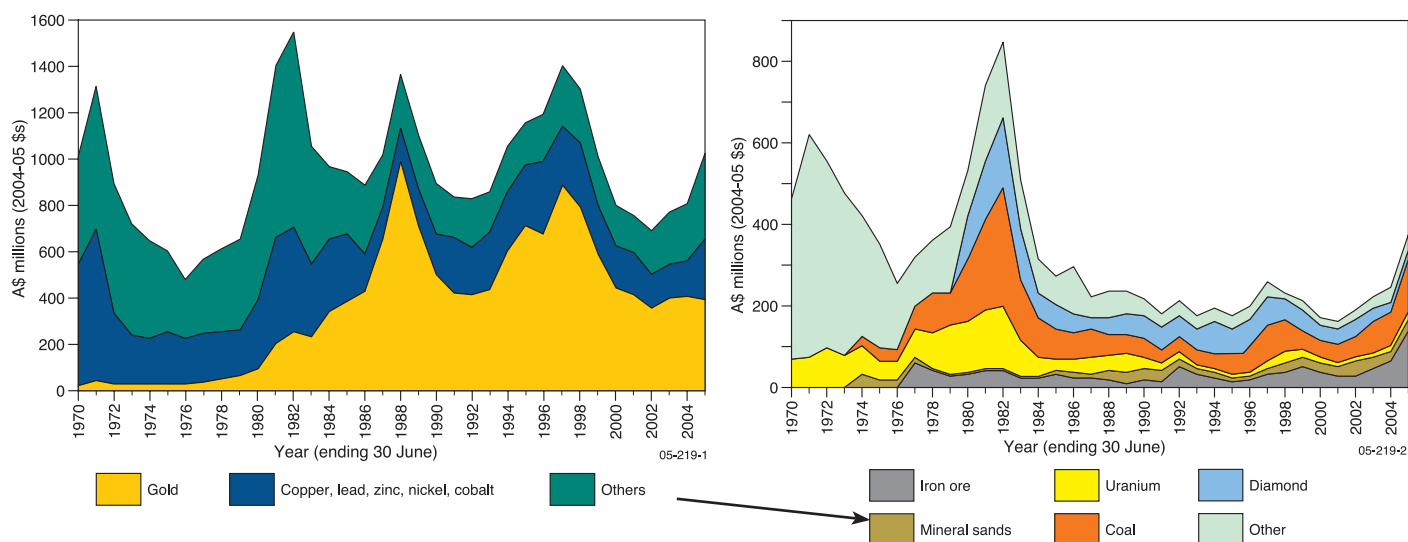
Queensland

- Smart Exploration is a new geoscience initiative to stimulate exploration with an additional \$20 million over 4 years to accelerate geoscience data acquisition in the priority areas of Mount Isa (base-metals, copper-gold, diamonds and geothermal energy), Drummond Basin and Mount Rawdon regions (gold and copper), and the Bowen and Surat Basins (coal, coal seam gas).
- Smart Exploration programs include airborne geophysics, gravity, deep seismic reflection, hyperspectral, and magneto-telluric surveys, structural studies, geological mapping and 3D modelling, as well as data capture from historical exploration reports and conversion into digital formats.



Figure 1: Australian mineral exploration expenditure in constant 2004-05 dollars.

Based on Australian Bureau of Statistics data deflated by Consumer Price Index.



South Australia

- To date, under the Plan for Accelerating Exploration (PACE) collaborative drilling program 106 successful proposals have been awarded government grants totalling more than \$6.1 million for exploration in the State. The copper-gold discovery at Carrapateena and other positive drilling results were achieved.
- Acquisition of ground gravity data over the central Gawler Craton and the northern Curnamona region has increased exploration licence coverage by approximately 22%.
- The release of new geoscientific mapping data through SARIG has generated significant additional exploration activity and applications for tenements in the Gawler Craton and Curnamona Province.

Tasmania

- Building on work conducted under the Western Tasmanian Regional Minerals Program and the development of the 3D geological model and prospectivity analysis of Tasmania, the digital geology of 94 1:25 000 sheets covering the main mineral belt, the Mount Read Volcanics, was updated and released in 2005.
- Geoscience Australia and Mineral Resources Tasmania jointly completed a project on the mineralisation potential of the Palaeozoic granites of Tasmania including a comprehensive rock geochemical database.

Victoria

- 17th VIMP data release in June included the "Victoria - Geoscientific Data Package", Open File mineral exploration licence reports and a range of products to assist explorers.
- A number of new data layers were added to the GeoVic online web mapping application including geological structure measurements, 3D seismic surveys and mineral graticules.

Western Australia

- Using Western Australian Government initiative funding of \$3 million per annum, airborne and/or ground geophysical programs were conducted in cooperation with Geoscience Australia in the southern Yilgarn, Albany-Fraser Orogen, Paterson area north of the Telfer mine, Gascoyne, and in the Tanami area.
- About 7000 statutory mineral exploration reports were digitally scanned in 2005 using Western Australian government initiative funding of \$1.2 million over three years. These and the other 14 000 reports to be scanned during this program will be released to open file under recent amendments to the WA Mining Act that permit release of reports that have been held by the WA Department of Industry and Resources for more than five years.

EXPLORATION

Exploration resulted in significant increases in resources at known deposits and a substantial number of drill intersections of economic interest. Gold and base metals remained the major targets but a surge of activity was recorded in iron ore and uranium exploration. Among the more notable discoveries were copper-gold mineralisation at Carrapateena in the Gawler Craton and mineral sands deposits in the Eucla Basin, both in South Australia.

Gold

ABS reported gold exploration spending for 2004-05 was \$391.7 million, a reduction of \$5.4 million over 2003-04. Increases in New South Wales, Queensland and the Northern Territory were insufficient to offset reductions in other jurisdictions. Western Australia was the focus of gold exploration with \$259.6 million (66% of total spending). It should be noted that this ABS data will not include exploration for copper-gold mineralisation where the explorer nominates copper as the principal commodity sought. Such expenditure will be reported as exploration for copper. This is likely to have occurred in South Australia and New South Wales where exploration for Olympic Dam and Cadia style mineralisation was prominent. Both States recorded substantial increases in copper exploration spending in 2005.

Results of particular interest were the intersections reported at Carrapateena in South Australia, and those at Trident, Pithara and Karlawinda Bore, Western Australia. Continuing encouraging results were reported from the Woolgar prospect in Queensland and from the historic mining areas of Bendigo and Ballarat in Victoria (Figure 2).

New South Wales

- Newcrest Mining Limited announced an initial reserve estimate for the **Cadia East** project. The Probable Reserve of underground minable ore totalled 165 Mt @ 1.1g/t Au and 0.38% Cu for contained metal of 6.0 Mozs Au and 0.63 Mt Cu. Resources at Cadia East, which include the reserve total 830 Mt containing 18.2 Mozs Au and 2.9 Mt Cu in the Indicated and Inferred Resource categories.
- Alkane Exploration Limited reported an encouraging intersection from drilling into the Hangingwall Zone at the **Wyoming One** deposit. A zone of 12 m @ 3.45g/t Au (from 329 m depth) included 4 m @ 5.37g/t Au. In drilling to test structures in the Porphyry and Northern Zones adjacent to the Hangingwall Zone, significant mineralisation was encountered in east-west structures in the Porphyry Zone. Intersections included 5 m @ 7.65g/t Au, 14 m @ 15.48g/t Au and 66 m @ 13.8g/t Au which included 11 m @ 54.69g/t Au. Recent drilling returned 66 m @ 19.49g/t Au from 268 m.
- Moly Mines Limited reported encouraging drill results from on-going diamond drilling at the **Dargues Reef** gold project near Braidwood. Drilling has increased the extent of the mineralisation with significant intersections in new holes including 74.0 m @ 2.6g/t Au and 50.0 m @ 2.8g/t Au and within these are high-grade zones of 25 m @ 6.1g/t Au, 11 m @ 8.9g/t Au and 5.5 m @ 7.9g/t Au. A parallel lode north of the main system returned 7m @ 7.6g/t Au. The company announced an Inferred Resource of 3.72 Mt @ 3.0g/t Au (0.36 Mozs) for the project.
- At the **Phoenix** prospect, part of Malachite Resources NL's Tooloom project, 65 km west of Casino, results included 63 m @ 1.28g/t Au and 0.6% Sb from 7 m and 57 m @ 1.32g/t Au and 0.16% Sb from 5 m.

Northern Territory

- At the **Cosmo Deeps** deposit, 150 km south of Darwin, Northern Gold NL (now GBS Gold Australia Pty Ltd) has explored beneath the east and west flanks of the old Cosmo open pit. Drilling results included 4.1 m @ 10.1g/t Au from 622 m downhole and 4.7 m @ 7.1g/t Au from 358 m



Queensland

- At the Cracow project, near Cracow, Sedimentary Holdings Limited announced the discovery of the new **Kilkenny** zone 400 m west of the Crown Shoot. An intersection of 23.9 m @ 7.4g/t Au including 5.9 m @ 21g/t Au was reported. Subsequent drilling yielded 21 m @ 9.6g/t Au, 1 m @ 103g/t Au including visible gold and 9.8 m @ 3.1g/t Au.
- Ongoing drilling at the **Woolgar** epithermal gold project, 100 km north of Richmond, by Strategic Minerals Corporation NL yielded high-grade intersections from an anomaly linking the Grand Central and Camp Vein structures. Drilling returned 1 m @ 263g/t Au from 29 m, 6 m @ 10.24g/t Au from 41 m and 6 m @ 16.75g/t Au from 74 m. Subsequent drilling at Camp Vein returned 1 m @ 21.0g/t Au, 3 m @ 30.04g/t Au and 7 m @ 21.29g/t Au. At Soapstar, intersections of 6 m @ 16.75g/t Au and 19 m @ 6.74g/t Au were reported. Later drilling at

Soapspar gave 1 m @ 34.7g/t Au, 1 m @ 14.3g/t Au and 5 m @ 5.43g/t Au.

- Straits Resources Limited discovered a large mineralised system beneath the old **Yandan** epithermal gold mine. An initial intersection of 176 m @ 2.4g/t Au, including a high grade zone of 27.5 m @ 8.1g/t Au, was followed up by another intersection of 194 m @ 2.1g/t Au including 30.5 m at 8.6g/t Au. Another hole stopped in mineralisation with 2.5 m @ 248g/t Au.
- The first hole drilled by Echelon Resources Limited at the **Cockatoo**/Parsons prospect 700 m south of the old Mount Leyshon open pit 30 km south Charters Towers returned 5 m @ 37g/t Au, 56g/t Ag, 0.1% Cu, 0.4% Pb and 3.1% Zn from 975 m downhole. Included in this intercept was 0.7 m @ 260g/t Au.
- Republic Gold Limited reported that drilling at its **Hodgkinson Basin** project in north Queensland has resulted in a doubling of resources. The deposits involved are Northcote, Sleeping Giant, Atric, Reedy and Hurricane. Reported aggregate resources are: Indicated 3.25 Mt @ 2.3g/t Au and Inferred 3.65 Mt @ 1.7g/t Au.

- Deep diamond drilling was undertaken by Resolute Mining Limited at the **Mount Wright** project, 15 km north of Ravenswood, to assist in the technical aspects of the project feasibility study. The aim was to increase confidence in deeper parts of the resource model and the results included 37 m @ 4.34g/t Au from 559 m, 26 m @ 3.97g/t Au from 559 m and 62 m @ 5.43g/t Au from 602 m. A decision to develop the deposit was taken after the end of the year.
- Citigold Corporation Limited released a comprehensive report on gold resources at **Charters Towers**. The project has a Probable Reserve of 0.8 Mt @ 13g/t Au for 0.33 Mozs Au. The reserve is part of an Indicated Resource estimated by the company to be 0.74 Mt @ 15g/t Au. These estimates are within an overall project Inferred Resource of 23 Mt @ 14g/t Au (>10 Mozs).

South Australia

- Oxiana Limited announced the addition of 1 Mozs to the gold resources at the **Prominent Hill** deposit, 650 km northwest of Adelaide. Aggregate Indicated and Inferred Resources in the Copper-Gold Breccia stand at 101 Mt @ 1.5% Cu and 0.55g/t Au and the Eastern Gold Zone has 21 Mt @ 1.2g/t Au. The metal content of these

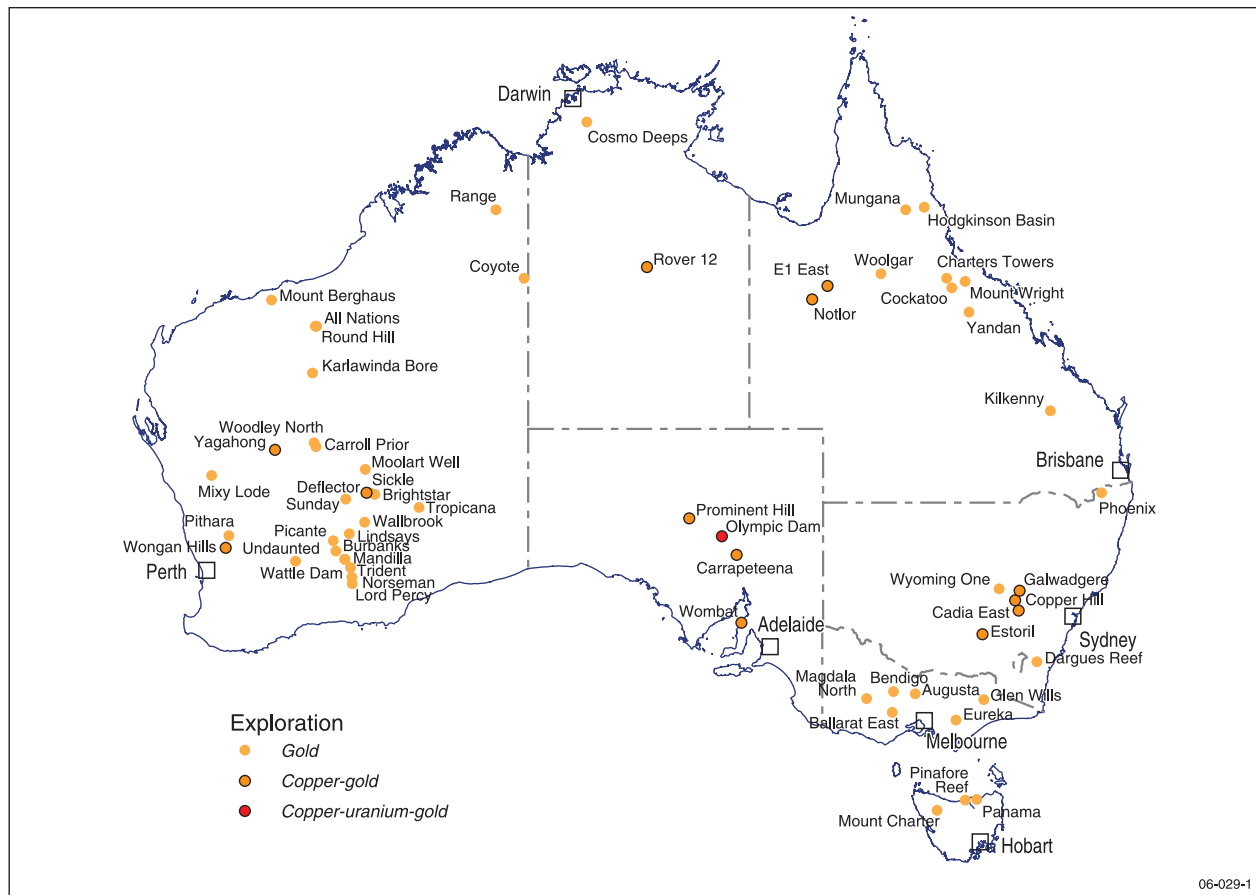


Figure 2: Selected gold and copper-gold mineral exploration projects, 2005

resources now stands at 1.5 Mt Cu and 2.6 Mozs Au. The Copper-Gold Breccia mineralisation remains open.

Tasmania

- Drilling of the **Pinafore Reef** in the Lefroy Goldfield, 40 km north of Launceston, by Lefroy Resources Limited returned high-grade intersections below old workings and some 200 m along strike from previously reported high-grade intersections. The new results included 1 m @ 23.88g/t Au from 54 m, 10 m @ 2.41g/t Au from 60 m including 1 m @ 13.62g/t Au. Lefroy subsequently announced an Inferred Resource of 304 000 t @ 22.9g/t Au (0.225 Mozs).
- At the **Mount Charter** gold prospect in northwest Tasmania, Bass Metals Limited reported an intersection of 58 m @ 1.84g/t Au and 35g/t Ag from surface from an initial diamond drill hole. Later drilling returned 80 m @ 1.6g/t Au and 61g/t Ag.
- In northeast Tasmania, TasGold Limited reported an encouraging intersection from its **Panama** prospect. The intersections in a single hole included 0.5 m @ 9.16g/t Au and 35.8g/t Ag from 61 m downhole and 0.5 m @ 2.19g/t Au and 16.5g/t Ag from 97.25 m downhole. The mineralisation occurs in what the company reports as previously unknown, stacked, near-surface, narrow gold-bearing quartz veins. This hole targeted a downdip extension of mineralisation intersected in 2004.

Victoria

- Bendigo Mining Limited announced the discovery of a new gold reef on the Sheepshead Line at **Bendigo**. The Alexandria Reef is at least 900 m long, 3-10 m wide and about 50 m high. Bendigo reported that while further drilling is required to assess the grade of the reef, the level of quartz, arsenopyrite and free gold observed in core suggests that it is probable that the reef will host economic grades. The company also announced that drilling had extended the Greater Garrad Reef, which contains 40% of Bendigo's gold reserves, by a further 250 m and infill drilling returned grades (eg 11 m @ 20g/t Au) consistent with bulk sample grades from the reef.
- Ballarat Goldfields NL reported further significant gold intersections from drilling at its **Ballarat East** prospect at Ballarat. An intersection of 30 m (true width) @ 24g/t Au from 562 m is interpreted as a continuation of an ore shoot previously intersected 100 m to the north which yielded 5.1 m @ 11.3g/t Au, 6.0 m @ 9.0g/t Au and 1.55 m @ 42g/t Au. Other results reported

include 2.0 m @ 28.8g/t Au, 3.0 m @ 11.0g/t Au and 4.5 m @ 7.1g/t Au. Production has commenced.

- Goldstar Resources NL reported visible gold in intersections from the first three holes drilled at its **Eureka** prospect at Walhalla. Current exploration is beneath old workings and is the first modern exploration of the target. Intersections reported include 1.85 m @ 16.48g/t Au, 2.00 m @ 64.61g/t Au and 1.9 m @ 4.37g/t Au.
- A diamond drill intersection of 7.9 m @ 10.0g/t Au, including 3.5 m @ 21.6g/t Au, at approximately 1270 m RL, was reported by Leviathan Resources Limited from the **Magdala North** mineralisation at Stawell. The Magdala orebody had previously been thought to narrow at depth but this intersection suggests that the mineralisation thickens and extends to the north.
- At the **Glen Wills** project near Omeo, Synergy Metals Limited reported intersecting 1.7 m @ 11.3g/t Au in a hole designed to test the down plunge extension of known mineralisation. This new intersection is about 30 m below previous intersections. A later hole yielded 3.5 m @ 5.81g/t Au in a quartz sulphide breccia with minor visible gold. Synergy also reported high-grade intersections from the Sunnyside project 3 km from Glen Wills. High-grade intersections reported were 1.8 m @ 18.87g/t Au, 0.8 m @ 208.9g/t Au and visible gold was reported from two other holes but assay results were not available.
- An intersection of 2.65 m @ 57.77g/t Au and 6.71% Sb was reported by A.G.D. Mining Limited from its **Augusta** project 50 km east of Bendigo. The company is re-furbishing flotation and gravity equipment for use at the project.

Western Australia

- A discovery of concealed gold mineralisation was reported by WMC Resources Limited at its **Karlawinda Bore** prospect 65 km southeast of Newman. Intersections in two holes were 1 m @ 14.2g/t Au, 7 m @ 4.6g/t Au including 1 m @ 21.8g/t Au and 6 m @ 4.5g/t Au including 1 m @ 18.3g/t Au.
- Avoca Resources Limited reported further high-grade intersections from its **Trident** deposit at Higginsville including 7 m @ 72g/t Au in a new lode. Infill drilling elsewhere in the deposit yielded 60 m @ 7.6g/t Au and 1 m @ 162g/t Au. Avoca announced an initial resource for Trident of Indicated Resources at 2.72 Mt @ 5.1g/t Au for 0.45 Mozs and Inferred Resources at 0.26 Mt @ 4.3g/t Au for 36 000 ozs. Later drilling returned 27 m @ 88g/t Au, at

the projected junction of the Western Zone and Athena Lode, which included 10 m @ 229g/t Au. Also reported was 25 m @ 3.4g/t Au in a new mineralised zone between the Eastern and Western zones.

- At the **Coyote** deposit, in the Western Australian side of the Tanami, Tanami Gold NL reported that diamond drilling had significantly increased confidence in the geological model, grade distribution and continuity of mineralisation. The new high-grade Scooby Lode returned 'bonanza' grade intersections including 0.2 m @ 847g/t Au from 178.1 m and 0.3 m @ 143g/t Au from 173 m. Coyote has a total resource of 2.7 Mt @ 5.2g/t Au which, due to the high-grade, nuggetty nature of the deposit, is considered by the Company to be conservative. Mining leases required for Stage 1 development at Coyote were granted in October and the Environmental Protection Agency determined that the project is unlikely to cause any significant environmental impact. Production from the deposit is targeted for mid-2006.
- A1 Minerals Limited advanced exploration of the **Brightstar** prospect 30 km southeast of Laverton. Drilling to assist with the establishment of resources at the Brightstar Alpha prospect (previously called the Brightstar Discovery Zone) returned 7 m @ 16.95g/t Au, 19 m @ 3.3g/t Au and 11 m @ 2.93g/t Au. A1 acquired the Mikado gold mine located 15 km southwest of Brightstar Alpha and has renamed it Brightstar Beta. In-pit drilling at Brightstar Beta returned high-grade intersections within 20 m of the surface. These included 14 m @ 18.5g/t Au, 3 m @ 58.1g/t Au and 2 m @ 38.1g/t Au. A1 announced a Measured, Indicated and Inferred Resource for Brightstar Alpha of 1.122 Mt @ 3.72g/t Au for 134 030 ozs and for Brightstar Beta it was 1.762 Mt @ 4.52g/t Au for 266 260 ozs Au.
- Anglo Australia Resources NL reported spectacular intersections from palaeochannel mineralisation at its **Mandilla** project 70 km south of Kalgoorlie. The new zone (Endymion) had intersections including 3 m @ 226.22g/t Au, 3 m @ 71.82g/t Au and 1 m @ 128.78g/t Au, all at depths of 16 to 19 m below surface. Anglo Australian announced an upgraded resource estimate for Mandilla where a Probable Reserve of 70 000 t @ 7.52g/t Au is contained within an Indicated Resource of 53 000 t @ 10.22g/t Au. The reserve covers pits designed at the West Mandilla and Endymion mineralisation.



- Ongoing exploration at the **Sickle** deposit, 10 km southeast of Laverton, by Crescent Gold Limited returned high-grade mineralisation north of the deposit's main zone. Intersections included 2 m @ 14.2g/t Au from 77 m, 12 m @ 4.4g/t Au from 58 m and 8 m @ 3.3g/t Au from 51 m. Crescent reported Indicated plus Inferred oxide resources of 3.11 Mt @ 2.1g/t Au and Indicated and Inferred primary ore resources of 6.59 Mt @ 1.5g/t Au for the Sickle deposit.
- Agincourt Resources Limited reported that ongoing diamond drilling intersected wide gold mineralisation at its new **Woodley North** Lode near Wiluna. Intersections included 42.6 m @ 6.0g/t Au and 27.7 m @ 9.9g/t Au and are reportedly some of the thickest intersections recorded since the discovery of the 1 Moz Bulletin lode in 1992. In another discovery, Agincourt reported that drilling at the **Carroll Prior** prospect 2.5 km south of the current Williamson Pit at its Wiluna project, had intersected significant gold mineralisation. The mineralisation is hosted in sheared, quartz veined and altered felsic rocks and intersections included 22 m @ 3.3g/t Au, 14.7 m @ 2.2g/t Au and 11.6 m @ 3.0g/t Au.
- Independence Group NL reported that drilling at **Tropicana**, east of Laverton, by AngloGold Ashanti Limited had returned intersections including 38 m @ 3.0g/t Au, 26 m @ 2.29g/t Au and 26 m @ 2.2g/t Au. The company suggests that this is in a potential new gold province on the southeast margin of the Yilgarn Craton.
- Shallow, high-grade intersections were reported by Independence Group NL from the **Pithara** prospect at its Dalwallinu project 250 km northeast of Perth. This discovery was made under shallow cover and intersections included 7 m @ 21.8g/t Au from 20 m, 9 m @ 6.3g/t Au from 19 m and 6 m @ 4.9g/t Au from 12 m. The company noted that although mineralisation known to October had a short strike length it appears to be thickening with depth.
- At the **Mt Berghaus** project in the Pilbara region, De Grey Mining Limited continued to report encouraging intersections including 3 m @ 25.74g/t Au, 7 m @ 6.92g/t Au and 5 m @ 10.34g/t Au. Strike length of the mineralisation exceeds 5.5 km.
- Northern Star Resources Limited reported shallow high-grade intersections from the first drilling program at its **Range** prospect 130 km north of Halls Creek. Preliminary results reported by the company include 5 m @ 15.08g/t Au and 34.94g/t Ag from 23 m, 2 m @ 1.02g/t Au and 26.5g/t Ag from 18 m and 1 m @ 1.08g/t Au and 33.5g/t Ag from 38 m.
- In the Pilbara region, Northwest Resources Limited announced encouraging high-grade intersections from drilling at its Nullagine project about 18 km east of Nullagine. At **Round Hill** results included 6 m @ 40.12g/t Au from 30 m, 14 m @ 8.92g/t Au from 10 m and 4 m @ 6.22g/t Au from 37 m. Subsequent drilling returned 14 m @ 11.69g/t Au from 10 m downhole, 5 m @ 11.28g/t Au from 18 m downhole and 4 m @ 6.47g/t Au from 8 m downhole. At Little Wonder West the company reported 24 m @ 1.81g/t Au from 7 m downhole, 16 m @ 2.36g/t Au from 18 m and 11 m @ 3.10g/t Au from 29 m.
- Wedgetail Exploration NL reported high-grade intersections in drilling at its **All Nations** prospect 15 km east of Nullagine in the Pilbara region. Intersections included 16 m @ 8.45g/t Au from 11 m, 11 m @ 4.48g/t Au from surface and 7 m @ 6.01g/t Au from 28 m.
- High-grade near surface intersections were reported by Ramelius Resources Limited from infill drilling and resource extension drilling at its **Wattle Dam** project near Spargoville. Intersections included 10 m @ 66.5g/t Au from 9 m, 14 m @ 20.1g/t Au from surface and 6 m @ 10.5g/t Au from 22 m. In November, Ramelius announced that it had committed to mining the Wattle Dam deposit.
- Drilling by Giralia Resources NL at its **Mixy** prospect in the Snake Well project, 450 km north of Perth, returned high-grade intersections of 11 m @ 14.99g/t Au including 3 m @ 42g/t Au and 10 m @ 5.85g/t Au including 1 m @ 52g/t Au. Later results reported included 11.4 m @ 13.69g/t Au, 4.6 m @ 9.81g/t Au and 3 m @ 8.88g/t Au.
- Regis Resources NL announced a scoping study for the **Moolart Well** project, 100 km north of Laverton. The deposit hosts 0.458 Mozs Au in laterite to a depth of 100 m. The scoping study will evaluate technical and economic options for development of a mine. In addition, a further 25 000 m of drilling will be done. Drill results reported include 46 m @ 12.04g/t Au from 24 m, 12 m @ 22.53g/t Au from 36 m and 36 m @ 3.93g/t Au from 24 m.
- Barra Resources Limited reported high-grade intersections from the Tailor Shoot beneath the old Lady Robinson open pit at its **Burbanks** project 8 km southwest of Coolgardie. The drilling extended the shoot and provided increased confidence in its geometry and grade. Intersections reported include 12 m @ 21.9g/t Au, 25 m @ 17.0g/t Au and 36 m @ 7.4g/t Au.
- Hannans Reward Limited reported an intersection of 4 m @ 20.87g/t Au from 64 m at its **Sunday** prospect at Leonora. This is about 250 m from an earlier intersection of 1 m @ 21.66g/t Au. A later intersection returned 21 m @ 1.48g/t Au including 8 m @ 3.52g/t Au from a downhole depth of 40 m.
- At the **Lord Percy** prospect, 22 km south of Norseman, Mawson West Limited announced significant new intersections including 3 m @ 19.76g/t Au from 50 m and 7 m @ 6.3g/t Au from 80 m.
- At the Kunanalling project near Kalgoorlie, Cazaly Resources Limited has identified gold mineralisation at the **Picante** prospect. Drilling on the shoot yielded 7 m @ 13.6g/t Au from 5 m downhole, 24 m @ 4.1g/t Au and 16 m @ 5.2g/t Au. A resource of 39 500 ozs was subsequently reported.
- St Barbara Mines Limited reported that testing for extensions of the **Undaunted** Lode at Marvel Loch yielded high-grade intersections including 12 m @ 25.8g/t Au from 364 m and 3 m @ 42.5g/t Au from 345 m below surface. Underground production at Marvel Loch is being sourced from the Undaunted Lode.
- In the first half of 2005, Jackson Gold Limited more than doubled resources at its **Wallbrook** project, 120 km northeast of Kalgoorlie, to 0.423 Mozs. These are composed of Indicated Resources of 4.546 Mt @ 2.05g/t Au and Inferred Resources of 1.702 Mt @ 2.27g/t Au. The resources are in the Crusader, Eleven Bells, Redbrook and Red Flag deposits.
- Croesus Mining NL estimated that at the end of June the reserves at its **Norseman** project were 2.2 Mt @ 7.8g/t Au (0.545 Mozs). This is the highest level of reserves in the 70 year history of continuous operation of the Norseman project. The reserves are included in a total resource of 2.2 Mozs of gold in 16.6 Mt of ore @ 4.2g/t Au.
- Carrick Gold Limited announced a 50% increase in resources at its **Lindsays** Tenements 50 km north northeast of Kalgoorlie. The aggregate resource is 23.2 Mt @ 2.2g/t Au for 1.67 Mozs Au. Of the total, 19.7 Mt @ 2.2g/t Au is in the Inferred Resource category. Subsequent drilling at the project returned high-grade intersections at the Parrot Feathers prospect including 1 m @ 102.45g/t Au, 4 m @ 4.65g/t Au and 1 m @ 16.51g/t Au.

Copper-gold

New South Wales

- Drilling by Golden Cross Resources Limited at the **Copper Hill** project near Molong returned encouraging intersections including 164 m (from surface) @ 0.90g/t Au and 0.62% Cu. Included in the intersection was 124 m @ 1.11g/t Au and 0.68% Cu. Other results included 48 m @ 0.33g/t Au and 0.69% Cu, 10 m @ 0.11g/t Au and 0.47% Cu and 6 m @ 0.64g/t Au and 0.36% Cu. Further drilling returned 129.8 m @ 1.8g/t Au and 0.79% Cu from 48 m and ended in mineralisation. This intersection includes 22 m @ 2.26g/t Au and 1.19% Cu and this deeper, high grade zone is only 100 m below surface.
- Alkane Exploration Limited reported an Indicated Resource for the **Galwagere** deposit near Wellington of 2.09 Mt @ 0.99% Cu and 0.3g/t Au at a 0.5% Cu cut-off grade.
- Goldminco Corporation announced results of drilling at the recently discovered, **Estoril** porphyry copper-gold prospect in the Temora Project area of the Lachlan Fold Belt. Intersections reported include 112 m @ 0.3g/t Au and 0.24% Cu, 66 m @ 0.45g/t Au and 0.23% Cu and 38 m @ 0.47g/t Au and 0.26% Cu.

Northern Territory

- Recent drilling at Adelaide Resources Limited's **Rover** copper-gold project in the Tennant Creek region confirmed the potential of the system. Rover 12 returned an intersection of 55 m @ 0.31% Cu and 0.02g/t Au including 15.1 m @ 0.57% Cu and 0.03g/t Au from 465.3 m.

Queensland

- At its Cloncurry project, 8 km east of the Ernest Henry mine northeast of Cloncurry, Exco Resources NL reported new mineralisation at the **E1 East** prospect. Drill intersections included 72 m @ 1.25% Cu and 0.4g/t Au, 42 m @ 1.75% Cu and 0.59g/t Au and 108 m @ 0.68% Cu and 0.2g/t Au. Exco announced the first resource estimate for its E1 South deposit at the Cloncurry project - an Inferred Resource of 10.336 Mt @ 0.67% Cu and 0.17g/t Au of which just over 10% is oxide ore. Contained copper is 69 100 t and gold is 55 800 ozs. This new resource brings the total contained metal in the Cloncurry project deposits to 239 100 t of copper and 192 600 ozs of gold.

- Exco Resources NL reported copper-cobalt-gold mineralisation at the **Notlor** prospect in its Cloncurry project at Cloncurry. Intersections included 46 m @ 2.42% Cu, 0.97g/t Au and 0.25% Co and 24 m @ 3.48% Cu, 1.38g/t Au and 0.27% Co.
- Universal Resources Limited discovered a new satellite copper gold system at its Roseby Project near Mount Isa to be called the **Ivy Ann** Prospect. Initial intercepts include 61m at 0.89% Cu and 0.15g/t Au, and 66 m at 0.75% Cu and 0.08g/t Au.

South Australia

- RMG Services reported intersecting Olympic Dam/Prominent Hill-style iron oxide copper-gold mineralisation in a hole drilled at its Carrapateena Prospect, 100 km southeast of Olympic Dam. Hole CAR002 intersected a sequence of hematite alteration of variable intensity, sulphide development and brecciation over 185 m between 469 m and 654.2m. The interval from 476 m to 654.2 m (178.2m) yielded 1.83% Cu and 0.64g/t Au. RMG's drilling was 50% funded through the South Australian Government's PACE plan to encourage mineral exploration in the State. Teck Cominco Limited has become a partner in the project.
- Red Metal Limited reported previously unrecognised gossanous ironstone at the **Wombat** prospect near Wallaroo. Aircore drilling returned low-grade copper and copper-gold mineralisation including 30 m @ 0.52% Cu, 29 m @ 0.44% Cu and 0.1g/t Au and 5 m @ 0.43% Cu and 0.05g/t Au. A three-hole diamond drilling program later confirmed wide intervals of low grade copper+/-gold mineralisation. One hole returned a significant intersection of 36 m @ 1.14% Cu and 0.29g/t Au which included 10 m 2.45% Cu and 0.7g/t Au. The tenement is held by Adelaide Resources Limited and the Phelps Dodge Australia Inc/Red Metal Limited Alliance is earning a 70% joint venture interest.

Western Australia

- Dominion Mining Limited reported new mineralisation from the **Wongan Hills** prospect 130 km northeast of Perth. Results included 3 m @ 0.7% Cu and 1.35g/t Au, 36 m @ 0.57% Cu, including 6 m @ 1.9% Cu and 2.4g/t Au, 9 m @ 0.69% Cu, including 2 m @ 2.08% Cu and 1.6g/t Au.
- At the **Yagahong** prospect in Reward Minerals Limited's Gabanintha project, 45 km southeast of Meekatharra, the company reported

high-grade copper-gold intersections north of the former Yagahong gold open pit. Included in the intersections were 7 m @ 11.3g/t Au and 1.32% Cu, 12 m @ 6.53g/t Au and 1.5% Cu and 4 m @ 9.66g/t Au and 2.30% Cu. Later drilling also yielded strong results including 2 m @ 12.39g/t Au and 2.46% Cu from 94 m and 4 m @ 6.80g/t Au and 1.38% Cu from 84 m. Reward announced an Indicated Resource of 511 470 t @ 4.35g/t Au for 71 559 ozs.

- Deep drilling by Batavia Mining Limited at its **Deflector** deposit 200 km east of Geraldton, resulted in encouraging intersections of copper-gold mineralisation. Results reported include 4.9 m @ 19.2g/t Au and 0.94% Cu from 309.6 m, 2.2 m @ 30.2g/t Au and 5.96% Cu from 225.8 m and 1.5 m @ 11.9g/t Au from 232.4 m. These were followed by 9.00 m @ 65.2g/t Au and 3.95% Cu, 2.88 m @ 11.8g/t Au and 0.38% Cu and 2.00 m @ 7.30g/t Au and 0.54% Cu.

Copper, lead, zinc, silver

ABS reported copper exploration spending for 2004-05 was \$71.3 million, an increase of \$33.5 million (89%) over 2003-04. An increase in spending in South Australia of 139% saw it become the principal target for copper exploration as spending reached \$32.7 million. In Queensland, an increase of 65% to \$24.8 million was recorded resulting in South Australia and Queensland accounting for 81% of all copper exploration spending. As referred to under gold it should be noted that this ABS data will include exploration for copper-gold mineralisation where the explorer nominated copper as the principal commodity. All such expenditure will be reported as exploration for copper.

In contrast to the strong growth reported in nickel and copper, zinc, lead, silver exploration rose by only \$1.5 million to \$31.2 million. Queensland is the major target for zinc, lead, silver exploration but ABS, for reasons of confidentiality, does not release the amount. Those States for which expenditure is reported are: New South Wales (\$5.5 million), Western Australia (\$4.8 million), Tasmania (\$3.7 million) and the Northern Territory (\$1.1 million). Locations of selected exploration projects from which interesting intersections were reported are shown in Figure 3.



New South Wales

- Perilya Limited reported high-grade zinc mineralisation from five prospects 10 km west of its Broken Hill operations. They suggest that these results, including the following **Henry George** intersections, indicate potential for additional ore for the Broken Hill operation. Henry George intersections were 2 m @ 17.8% Zn, 1.3% Pb and 65g/t Ag and 5 m @ 6.4% Zn, 0.1% Pb and 13g/t Ag.
- Triako Resources Limited reported that drilling at the **Hera** prospect near Nymagee, identified additional gold-base metal mineralisation, the Far West Lens. A 5.7 m intersection returned 3.0g/t Au, 3.9% Pb+Zn and 13g/t Ag from 546 m including 2.22 m @ 6.0g/t Au, 0.1% Cu, 7.8% Zn and 25g/t Ag. A new estimate for resources in the Hera deposit was released by Triako. Total resources, mainly in the inferred category, are 1.94 Mt @ 6.7g/t Au, 0.2% Cu, 2.8% Zn, 2.5% Pb and 14g/t Ag. Contained gold in the resource is 0.416 Mozs.

Northern Territory

- Reward Minerals Limited reported significant results from drilling at its **Jervois** project including 6 m @ 5.2% Cu from 65.0 m at the Bellbird

prospect and 14 m @ 9.9% Pb, 2.8% Zn and 89g/t Ag from 32m at Green Parrot. Reward subsequently announced that Teck Cominco Australia Pty Ltd had farmed into the venture.

- Intersections of 20 m @ 2.07% Cu, 0.30% Co and 0.37% Ni and 12 m @ 2.17% Cu, 0.03% Co and 0.09% Ni were reported by Compass Resources NL, from its **Browns East** Oxide prospect 80 km south of Darwin. They commented that it is likely that the oxidised copper-cobalt-nickel mineralisation is in the weathered near surface expression of the Browns East deposit (resource of 30.5 Mt @ 1.29% Cu, 1.28% Pb, 0.13% Co and 0.13% Ni).
- Drilling at the **Mt Fitch** copper deposit, 55 km south southeast of Darwin, by Compass Resources NL has extended the main mineralised trend a further 400 m beyond the established oxide resource. Intersections reported include 18 m @ 2.06% Cu, 0.12% Co and 0.15% Ni, 22 m @ 1.08% Cu, 0.01% Co and 0.07% Ni and 15 m @ 1.24% Cu, 0.01% Co and 0.07% Ni. Mt Fitch has an established oxide resource of 1.3 Mt @ 0.6% Cu, 0.21% Co and 0.20% Ni.

Queensland

- Drilling by Kagara Zinc Limited at its **Mungana** base metal deposit near Chillagoe extended the envelope of gold mineralisation surrounding the base metal resource. One intersection returned 50.70 m @ 2.72g/t Au, 0.6% Zn, 0.2% Pb, 0.2% Cu and 17g/t Ag. Another was 50.25 m @ 2.88g/t Au, 0.5% Zn, 0.1% Pb, 0.5% Cu and 11g/t Ag. Other drilling gave high-grade zinc intersections including 3.02 m @ 18.1% Zn, 1.6% Cu, 86g/t Ag and 0.98g/t Au and 13.94 m at 16.8% Zn, 3.4% Cu, 205g/t Ag and 1.10g/t Au. The company reported that drilling appears to be defining a substantial body of high-grade zinc-copper mineralisation. Later results included 13.94 m @ 3.38% Cu, 16.83% Zn, 0.06% Pb, 1.10g/t Au and 119g/t Ag, 0.85 m @ 4.65% Cu, 28.8% Zn, 0.01% Pb, 0.67g/t Au and 58g/t Ag and 1.25 m @ 3.40% Cu, 13.40% Zn, 20.60% Pb, 2.08g/t Au and 280g/t Ag.
- At the **Muldiva** prospect 30 km southeast of Chillagoe, Kagara Zinc Limited reported a range of encouraging intersections. These included 6 m @ 16.2% Zn, 4.0% Pb, 802g/t Ag and 1.6g/t Au, 3 m @ 8.9% Zn, 2.4% Pb and 222g/t Ag and 3 m @ 18.3% Zn, 1.1% Pb and 146g/t Ag.

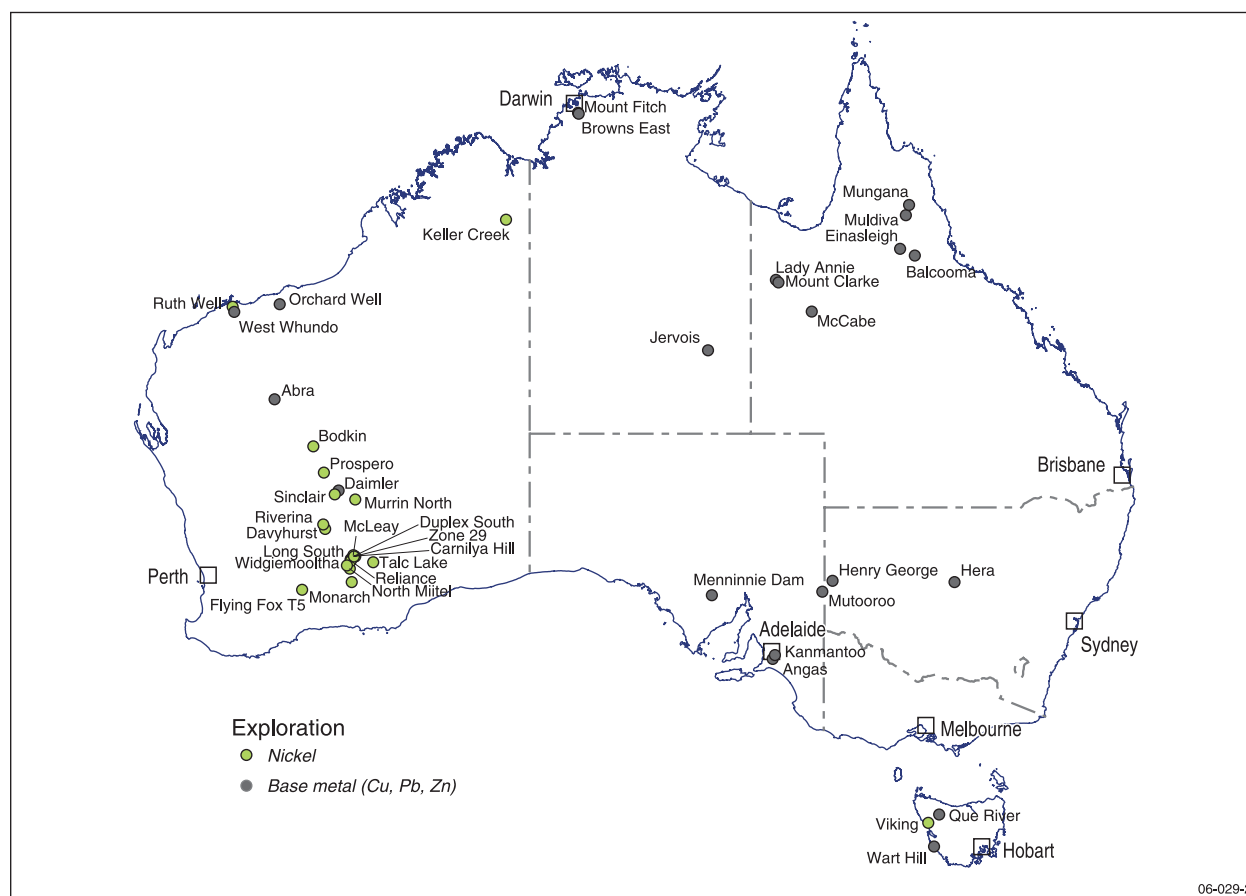


Figure 3: Selected nickel and base metal exploration projects, 2005.

- Kagara Zinc Limited reported significant intersections of copper mineralisation at its **Balcooma** project some 60 km east of Kidston. Intersections included 52 m @ 4.5% Cu, 21g/t Ag and 0.37g/t Au, 44 m @ 4.5% Cu, 20g/t Ag and 0.49g/t Au and 61 m @ 3.1% Cu, 12g/t Ag and 0.32g/t Au. The mineralisation is still open and Kagara believe that this drilling will add substantial tonnages to the primary copper orebody at Balcooma which has 1.978 Mt @ 3.3% Cu. Later intersections reported are likely to add to these resources. Results included 8 m @ 5.9% Cu, 10 m @ 6.0% Cu and 37 m @ 4.5% Cu. Kagara reported a total resource (indicated+inferred) of 3.271 Mt @ 3.9% Cu, 0.1% Pb, 0.3% Zn, 18g/t Ag and 0.43g/t Au.
- Copper Strike Limited announced copper intersections from drilling at its **Einasleigh** Copper Mine prospect 300 km northwest of Townsville. Intersections included 15 m @ 11.76% Cu from 244 m, 11 m @ 3.10% Cu from 269 m and 2 m @ 9.83% Cu from 235 m. Later results released included 3 m @ 6.93% Cu from 232 m, 13 m @ 6.71% Cu from 241 m and 30 m @ 9.2% Cu. An initial Inferred Resource estimate was released by the company which, at a 0.5% Cu cut-off grade, was 0.94 Mt @ 3.3% Cu, 0.18g/t Au and 15g/t Ag.
- Drilling by CopperCo Limited at the **Lady Annie** project, 137 km north of Mount Isa, yielded an intersection of 22 m @ 6.7% Cu from 173 m downhole in transitional chalcocite ore below the Lady Annie oxide resource. Other intersections included 23 m @ 0.45% Cu from 103 m and 10 m @ 0.82% Cu from 144 m. In May, the company released a resource estimate (all categories) of 10.5 Mt @ 1.0% Cu (109 500 t Cu) for Lady Annie oxide resources. A combined oxide and transitional ore resource, at a 0.3% Cu cut-off grade, totalling 4.276 Mt @ 0.7% Cu was reported from **Mount Clarke**. Contained copper in the Measured, Indicated and Inferred Resource categories is 30 500 t. In addition, a small resource of 1 Mt @ 1.00% Cu (10 500 t Cu) was reported at the adjacent Flying Horse deposit.
- Matrix Metals Limited reported 28 m @ 2.93% Cu from 235 m in the first hole at its McCabe deposit, 40 km south of Cloncurry. This drilling was to test extensions to the existing mineralisation at **McCabe**. Other intersections from the hole included 3.0 m @ 0.66% Cu from 211.0 m, 6 m @ 0.7% Cu from 218 m and 1.3 m @ 0.92% Cu from 224.7 m.

South Australia

- BHP Billiton Limited released updated reserve and resource estimates for the **Olympic Dam** deposit. Proven and Probable Reserves total 756 Mt @ 1.5% Cu, 0.5 kg/t U₃O₈, 0.5g/t Au and 3.1g/t Ag within a total Measured, Indicated and Inferred Resource of 3970 Mt @ 1.1% Cu, 0.4 kg/t U₃O₈, 0.4g/t Au and 2.3g/t Ag.
- Exploration at the **Angas** project, 65 km southeast of Adelaide, reported by Terramin Australia Limited returned high-grade zinc and lead intersections from the Garwood, Hangingwall and Rankine Shoots. In the Garwood Shoot an intersection of 3.96 m @ 0.77% Cu, 7.49% Pb, 27.68% Zn, 102g/t Ag and 1.11g/t Au was reported. In the Hangingwall Shoot one intersection was 10.2 m @ 0.25% Cu, 2.05% Pb, 14.41% Zn, 28g/t Ag and 0.29g/t Au and in the Rankine Shoot 6.84 m @ 0.3% Cu, 12.01% Pb, 28.15% Zn, 140g/t Ag and 0.61g/t Au was reported. At the time these results were reported Terramin reported an Inferred Resource of 1.8 Mt @ 11% Zn, 4% Pb and 47g/t Ag for the Rankine Shoot.
- Terramin Australia Limited reported the discovery of new mineralised zones at the **Menninnie Dam** project west of Port Augusta. Intersections reported included 3.5 m @ 4.2% Zn, 21.5g/t Ag, 4 m @ 3.9% Pb, 2.1% Zn, 14 g/t Ag and 1 m @ 2.4% Cu, 3.5% Pb, 0.7% Zn and 165g/t Ag.
- At the **Kanmantoo** project, 55 km southeast of Adelaide, Hillgrove Resources Limited encountered encouraging intersections including 47 m @ 1.13% Cu, 25 m @ 1.24% Cu and 0.28g/t Au and 15.6 m @ 1.25% Cu. These results reportedly have potential to increase the existing resource at Kanmantoo which is 18.37 Mt @ 1.1% Cu and 0.2g/t Au.
- Drilling at Havilah Resources NL's **Mutooroo** prospect, 60 km west of Broken Hill, reportedly indicates a well mineralised shallow system. Results returned include 26 m @ 1.55% Cu and 0.18% Co from 101 m, 31 m @ 1.71% Cu and 0.18% Co from 78 m and 3 m @ 1.78% Cu and 0.13% Co from 29 m.

Tasmania

- Tasgold Limited reported further encouraging intersections from drilling at the **Wart Hill** prospect, 125 km south of Rosebery. Diamond drilling returned 2.4 m @ 162g/t Ag, 9.81% Zn, 5.11% Pb, 0.12% Cu and 0.4g/t Au from 22.6 m downhole and, from a second

hole, 7 m @ 55.6g/t Ag, 6.16% Zn, 3.33% Pb, 0.22% Cu and 1.81g/t Au from 197 m downhole.

- Drilling by Bass Metals Limited at **Que River** aimed at extending the resources in the S-Lens returned an encouraging intersection of 8.4 m @ 1.3% Cu, 35g/t Ag and 2.0% Zn which included 2.8 m @ 3.9% Cu, 3.0% Zn, 93.1g/t Ag and 0.35g/t Au.

Western Australia

- Continuing exploration by Fox Resources Limited at the **West Whundo** project near the Radio Hill nickel mine in the Pilbara region, built on high-grade intersections reported in 2004. Results included 14 m @ 5.65% Cu, 0.05% Zn and 3.0g/t Ag, 14 m @ 2.45% Cu, 0.03% Zn and 2.5g/t Ag and 3 m @ 4.76% Cu, 0.03% Zn and 1.5g/t Ag. Subsequent exploration at West Whundo confirmed the presence of a supergene copper zone composed primarily of chalcocite. Results include 8 m @ 19.94% Cu from 24 m below surface, 10 m @ 10.85% Cu from 18 m below surface and 12 m @ 9.50% Cu from 24 m below surface. Fox announced a Measured plus Indicated Resource for West Whundo of 0.894 Mt @ 2.0% Cu, 1.4% Zn and 3.3g/t Ag and an Indicated Resource of 32 000 t @ 5.3% Cu, 8.0% Zn and 45g/t Ag.
- Abra Mining Ltd reported long, high-grade intersections from drilling at the **Abra** deposit which is part of its Mulgul project 200 km north of Meekatharra. Intersections included 188 m @ 5.82% Pb, 0.24% Cu and 0.60% Zn from 352 m including 74 m @ 1.41% Zn, 5.52% Pb and 0.07% Cu. Other intersections included 6 m @ 11.22% Pb, 0.59% Cu and 0.76g/t Au from 562 m and 44 m @ 0.81g/t Au from 602 m which included 12 m @ 2.21g/t Au, 4.51% Pb and 0.43% Cu.
- At the **Orchard Well** prospect, 60 km south of Port Hedland, De Grey Mining Limited reported base metal and gold mineralisation in disseminated and massive sulphides beneath gossanous material. Results of drilling included 13 m @ 3.11% Zn, 1.36% Pb, 0.19% Cu, 1.19g/t Au and 58g/t Ag and 38 m @ 1.82% Zn, 4.52% Pb, 0.11% Cu, 504 ppb Au and 346g/t Ag.
- Jabiru Metals Limited announced the discovery of the **Daimler** deposit at its Teutonic Bore project, WA. A drill intersection of 30 m yielded 2.0% Cu, 0.3% Zn and 14.5g/t Ag from 90 m. Later results included 57 m @ 0.72% Cu, 0.33% Zn and 11.2g/t Ag from 42 m and



42 m @ 0.32% Cu, 3.09% Zn and 8.9g/t Ag from 159 m.

Nickel

Exploration for nickel in 2004-05 rose by 88% to \$158.6 million with all but \$9.9 million spent in Western Australia. In the Northern Territory, \$5.0 million was spent and in Tasmania annual spending was \$1.6 million. Most activity in Western Australia focussed on the search for sulphide mineralisation in the Yilgarn Craton but programs were also in progress in the Pilbara and Kimberley regions (Figure 3). While progress was made on the development of the Avebury deposit in Tasmania significant intersections from the Avebury area continued to highlight the prospectivity of the region.

Tasmania

- At the **Avebury** deposit, Allegiance Mining NL reported further encouraging drill intersections from the Viking deposit. Intersections included 31 m @ 1.5% Ni (downhole width), 5 m @ 1.8% Ni and 42 m @ 0.8% Ni. At West Viking, downhole intersections of 6.5 m @ 2.3% Ni and 2.0 m @ 1.3% Ni confirmed the area's potential indicated by earlier intercepts of 14 m @ 2.5% Ni and 12 m @ 1.6% Ni. A subsequent intersection at West Viking returned 30 m @ 1.7% Ni. In the Central Avebury deposit 25 m @ 1.5% Ni was recorded. Later drilling to test the lower boundary of the deposit returned 4.9 m @ 1.0% Ni and 5.0 m @ 2.2% Ni. At North Avebury an intersection of 48 m @ 1.7% Ni was reported. The company announced on 9 November a total resource of 11.59 Mt @ 1.02% Ni containing 118,000 t Ni. The total resources within a feasibility study area amounted to 10.19 Mt @ 0.98% Ni with a cobalt grade of 246 ppm Co.

Western Australia

- At the **Flying Fox T5** deposit, Western Areas NL reported 16.1 m @ 9.7% Ni. T5 has a Probable Reserve of 606 000 t @ 5.3% Ni and an Inferred Resource of 115 800 t @ 6.5% Ni. At T5 South the company reported an Indicated Resource of 141 600 t @ 9.0% Ni. Including these, the Indicated Resource at Flying Fox is 64 000 t Ni and the Inferred Resource is 9 200 t Ni. Western Areas reported zones of 10.45 m and 12.35 m of massive sulphides at T5 (assays are awaited).
- Drilling by Jubilee Mines NL at its **Prospero** deposit, 4.5 km south of the Cosmos nickel mine, reported subsequent to the release of a resource estimate, has yielded further

high-grade intersections including 19.6 m @ 10.3% Ni, 15.7 m @ 8.7% Ni and 7.10 m @ 5.2% Ni. The drilling program gave results that showed the mineralisation is thicker and of higher grade than predicted by the resource model. Jubilee reported that the Inferred Resources at Prospero are 1.06 Mt @ 5.72% Ni for contained nickel of 60 600 t. High-grade massive sulphides were reported by Jubilee from the Anomaly 4 prospect located 3.5 km south of the Cosmos nickel mine and immediately north of the Prospero deposit. Intersections included 2.4 m @ 6.1% Ni, 4.0 m @ 4.5% Ni and 3.0 m @ 1.1% Ni. Subsequent drilling returned 1.13 m @ 17.8% Ni and 2.83 m @ 15.5% Ni. This mineralisation is close to the proposed location of the decline for the Prospero deposit.

- Jubilee Mines NL also reported the discovery of nickel sulphides at its **Sinclair** prospect in the Bannockburn Nickel Project near Leonora. Diamond drilling intersected basal, contact related massive and disseminated nickel sulphides over a strike length of some 100 m. Intersections returned included 2.5 m @ 2.58% Ni, 1.45 m @ 2.25% Ni and 2.23 m @ 0.61% Ni. Jubilee suggests that this may be a new grassroots nickel discovery in an area where previous exploration has mainly been limited to shallow gold exploration with little focus on nickel.
- At the **Bodkin** prospect near Wiluna, previous drilling returned 6 m @ 0.5% Ni, 5.1 m @ 0.49% Ni and 2 m @ 2.15% Ni. Subsequent diamond drilling by Agincourt Resources Limited intersected 0.3 m @ 6.6% Ni in massive nickel sulphide on the ultramafic-basalt contact, just below a Kambalda-style basalt embayment structure. This is the first time massive nickel sulphides have been reported from the northern segment of the Perseverance-Wiluna greenstone belt. Additional drilling to the southeast intersected low-grade disseminated Ni mineralisation, including 1 m @ 0.87% Ni. The occurrence of a thick MgO-rich channel sequence, an embayment structure, sulphidic footwall rocks and the massive sulphide itself, indicate that this is an environment conducive to economic concentration of nickel sulphide.
- Consolidated Minerals Limited announced a successful drilling campaign at its **Reliance** project near Kambalda. Drilling returned intersections including 4.3 m @ 16.31% Ni and 1.5 m @ 10.77%

Ni. Consolidated announced resources for deposits in the area totalled 2.1 Mt @ 3.6% Ni made up of: East Alpha 0.565 Mt @ 4.65% Ni, Foster 0.743 Mt @ 2.63% Ni, East Cooe 0.245 Mt @ 2.2% Ni and Beta Hunt 0.508 Mt @ 4.46% Ni.

- Independence Group NL reported the discovery of the **McLeay** deposit at the Long Complex at Kambalda and announced resources of 13 000 t Ni. Ongoing exploration at McLeay returned intersections of 17 m @ 10.7% Ni, 6 m @ 8.3% Ni and 6 m @ 6.1% Ni. The McLeay mineralisation is open to the north, south and east.
- Drilling at the **Duplex South** prospect, 35 km southeast of Kalgoorlie, by Australian Mines Limited returned strongly mineralised, shallow intersections. They included 10 m @ 7.08% Ni, 2 m @ 7.29% Ni and 6 m @ 3.48% Ni. All mineralised intersections are within 66 m of the surface. Duplex South is 7 km from the Company's Blair underground mine.
- Fox Resources Limited announced that drilling encountered further high-grade intersections at the **Ruth Well** prospect, 30 km south of Karratha in the Pilbara region. Intersections included 11 m @ 4.3% Ni, 1.5% Cu and 0.13% Co from 55 m which included 3 m @ 13.1% Ni, 1.0% Cu and 0.35% Co from 59 m. Fox also reported 1.8 m of massive nickel sulphides below 5.5 m of disseminated nickel sulphides at the Sholl 2 deposit between the Radio Hill mine and Ruth Well.
- Barra Resources Limited reported 1 m @ 2.93% Ni and 0.19% Cu in primary massive nickel sulphides – the first indication of economic grade primary mineralisation – at the **Riverina** project, about 150 km north northwest of Kalgoorlie. Subsequent intersections reported include 0.37 m @ 10.88% Ni, 31.0 m @ 1.17% Ni and 1.14 m @ 2.28% Ni. The project is a joint venture between Barra (30%) and Riverina Resources Pty Ltd (70%).
- Thundellara Exploration Limited reported that LionOre Australia Limited had intersected massive nickel sulphides during drilling at the **Keller Creek** prospect in the East Kimberley region. This intersection of 6.77 m @ 1.98% Ni, 0.53% Cu and 0.16% Co was close to a previous intersection reported by LionOre of 5 m @ 0.69% Ni and 0.45% Cu. Surface expression of the mineralisation is a 70 m long gossanous outcrop.

- Exploration drilling at the **North Miitel** deposit, 70 km south of Kambalda, reported by Mincor Resources NL extended the mineralisation some 350 m north of the current ore reserve. Downhole intersections reported were 0.9 m @ 8.11% Ni and 1.15 m @ 6.22% Ni. Mincor also reported that it had demonstrated that mineralisation at South Miitel had a strike length of over 400 m with drilling intersecting massive, matrix and disseminated nickel sulphides. Intersections reported include 0.55 m @ 8.6% Ni, 5.57 m (downhole) @ 3.21% Ni, 1.90 m (downhole) @ 3.13% Ni and 11.5 m @ 2.53% Ni including 5.6 m @ 3.14% Ni.
- At the **Talc Lake** Prospect which is part of Oroya Mining Limited's Roe Hills project, 85 km east of Kambalda, nickel intersections included 1.9 m @ 1.64% Ni and 0.28% Cu and 0.3 m @ 1.46% Ni and 0.25% Cu.
- Independence Group NL reported 4.8 m @ 2.2% Ni including 1.4 m @ 4.3% Ni, in drilling from the Long South Exploration Decline at its **Long Mine** at Kambalda. The intersection is 30 m east of the decline and, along with other results, highlights the potential for additional nickel resources that can be accessed from the decline. The Company reports the mineralisation occurs in a basalt-ultramafic contact with a thin deformed basal massive sulphide layer overlain by disseminated and vein sulphides.
- Drilling at the **Zone 29** deposit in the Kambalda region by View Resources Limited yielded economic grade intersections that have potential to increase reserves at the deposit. Results included 3 m @ 2.28% Ni, 3 m @ 2.51% Ni, 2 m @ 3.26% Ni and 3 m @ 3.75% Ni including 1 m @ 8.06% Ni. Later drilling continued to yield good results with 2 m @ 4.40% Ni, 2 m @ 3.65% Ni and 1 m @ 4.13% Ni.
- Aircore drilling by Nickel Australia Limited at its **Davyhurst** project, 130 km north of Kalgoorlie, identified a zone with anomalous Ni, Cu and Pt+Pd levels. Results included 16 m @ 0.19% Ni, 1045 ppm Cu and 126 ppb Pt+Pd and 36 m @ 0.65% Ni, 229 ppm Cu and 24 ppb Pt+Pd. The project area has several ultramafic units including an extension of a unit hosting newly discovered high-grade nickel sulphide in an adjoining lease area.
- View Resources Limited reported that drilling at its **Carnilya Hill** operation, 25 km northeast of Kambalda, had discovered a

repetition of the Carnilya Hill orebody. Drilling encountered mineralisation within 30 m of the planned Carnilya Hill decline extension. Intersections reported include 8.69 m @ 2.84% Ni, 2.15 m @ 3.43% Ni and 2.09 m @ 3.26% Ni.

- GME Resources Limited reported drilling at the **Murrin North** project, 4 km northwest of the Murrin Murrin nickel plant, to test for extensions of high-grade laterite mineralisation of 2 m @ 4.6% Ni intersected further high-grade mineralisation. A high-grade zone of 2 m @ 4.20% Ni was recorded in a broader zone of 19 m @ 1.60% Ni. In November, the Company announced a new estimate for the laterite resource at the Mt Kilkenny, Eucalyptus, Murrin North and Waite Kauri deposits. Aggregate Measured plus Indicated Resources were estimated at 16.47 Mt @ 1.43% Ni and 0.11% Co and aggregate Inferred Resources totalled 6.65 Mt @ 1.34% Ni and 0.08% Co.
- At the **Monarch** prospect, 10 km northwest of Norseman, Nickel Australia Limited identified anomalous Ni-Cu-PGM results over a 1 km long zone from an aircore drilling program. Two diamond drill holes were drilled to test for primary mineralisation beneath the geochemical anomaly and both intersected nickel and copper sulphides. The aircore samples included 8 m @ 0.59% Ni, 298 ppm Cu and 104 ppb Pt+Pd, 60 m @ 0.41% Ni, 195 ppm Cu and 115 ppb Pt+Pd and 45 m @ 0.32% Ni, 465 ppm Cu and 128 ppb Pt+Pd. Subsequent drilling yielded 25 m @ 1.63g/t Pd and 0.43g/t Pt including 1 m @ 3.51g/t Pd and 1.10g/t Pt and 16 m @ 1.29g/t Pd and 0.37g/t Pt including 1 m @ 8.34g/t Pd and 2.4g/t Pt.
- Titan Resources Limited released updated resource estimates for its **Widgiemooltha** project, 25 km south of Kambalda. Deposits in the project include Cooke, Widgie Townsite, Armstrong McEwen and Zabel. The total resource of 8.225 Mt @ 1.49% Ni has 7.695 Mt @ 1.47% Ni in the Inferred Resource category. Exploration is continuing. The company later reported new drilling results from Armstrong which included intersections of 20.85 m @ 4.79% Ni, 3.42 m @ 2.59% Ni and 7.9 m @ 2.00% Ni. Drill intersections at Widgie Townsite included 13.65 m @ 2.84% Ni, 12.64 m @ 2.94% Ni and 1.66 m @ 6.42% Ni.

Iron ore

Spending on exploration for iron ore reported by ABS more than doubled in 2004-05 to \$138 million of which \$136.9 million was spent in Western Australia and \$0.9 million in the Northern Territory. The remaining \$0.2 million was spent in South Australia and Queensland but ABS did not report individual amounts. Strong demand from Asia and in particular China, saw interest in iron ore remain very strong throughout 2005. Junior companies showed renewed interest in the commodity with many revisiting deposits discovered during earlier exploration periods but which were not commercially viable at the time. Locations of selected projects from which interesting intersections were reported are shown in Figure 4.

- An upgrade of the resource estimates for the **Christmas Creek** iron ore resources in the Pilbara region was reported by Fortescue Metals Group Limited. Total resources at Christmas Creek are reported to be 1.412 Gt @ 58.14% Fe, 4.51% SiO₂, 2.54% Al₂O₃, 0.056% P and 7.77% LOI in the Indicated and Inferred categories. This includes Indicated plus Inferred high-grade resources of 465 Mt @ 60.29% Fe, 3.31% SiO₂, 1.96% Al₂O₃, 0.054% P and 7.33% LOI. A small channel iron deposit with an Inferred Resource of 14 Mt @ 58.02% Fe, 3.25% SiO₂, 2.37% Al₂O₃, 0.045% P and 9.98% LOI is also present. Fortescue subsequently released Probable Reserve estimates for the Cloud Break and Christmas Creek deposits. At Cloud Break they reported a high-grade reserve of 182 Mt @ 60.4% Fe, 3.0% SiO₂, 1.9% Al₂O₃, 0.051% P and 7.9% LOI and a low-grade reserve of 265 Mt @ 57.5% Fe, 5.1% SiO₂, 2.8% Al₂O₃, 0.058% P and 8.5% LOI. At Christmas Creek the Probable Reserve estimate reported was: high-grade 177 Mt @ 60.5% Fe, 3.4% SiO₂, 2.0% Al₂O₃, 0.051% P and 6.9% LOI and low-grade of 442 Mt @ 57.7% Fe, 5.2% SiO₂, 2.7% Al₂O₃, 0.049% P and 7.6% LOI. In December, the Company announced that the Iron Ore (FMG Chichester Pty Ltd) Agreement with the Western Australian Government had been signed. The Agreement establishes the legislative framework to allow implementation of the Company's mining operation.
- Atlas Gold Limited reported encouraging iron ore intersections from its **Pardoo** project, 75 km east of Port Hedland, WA. Intersections included 52 m @ 60.6% Fe and 0.1% P and 44 m @ 59.26% Fe and 0.12% P. The company also reported iron ore assays from rock chip sampling



at its Shaw River prospect, 120 km southeast of Port Hedland. Results included 57 m @ 57.49% Fe and 0.08% P, 43 m @ 59.17% Fe and 0.16% P and 25 m @ 60.14% Fe and 0.07% P.

- Golden West Resources Limited reported encouraging drill intersections from its **Wiluna West** prospect located 40 km west of Wiluna. Drilling targeted hematite enrichment in banded iron formations over a 1km strike length. First results were 29 m downhole width @ 68.25% Fe, 0.63% SiO₂, 0.45% Al₂O₃ and 0.12% P and 17 m downhole width @ 68.67% Fe, 0.72% SiO₂, 0.46% Al₂O₃ and 0.006% P.
- Initial drilling results from Gindalbie Metals Limited's **Blue Hills** project, 100 km south of Yalgoo, returned positive results. The Company reported that ore-grade hematite occurs at depths of 50 to over 100 m in structural settings similar to previously mined deposits in the area. Intersections included 18 m @ 61.71% Fe, 3.34% SiO₂, 2.34% Al₂O₃, 0.116% P and 5.08% LOI, 6 m @ 65.25% Fe, 1.78% SiO₂, 1.02% Al₂O₃, 0.098% P and 3.52% LOI and 24 m @ 59.13% Fe, 4.72% SiO₂, 2.79% Al₂O₃, 0.099% P and 7.41% LOI.
- At the **Argyle** iron ore project, 120 km south of Wyndham, WA, Resource Mining Corporation reported high-grade hematite mineralisation from drilling. Intersections reported were 6 m @ 66% Fe, 2.33% SiO₂, 0.98% Al₂O₃ and 0.09% P and 4 m @ 63% Fe, 3.37% SiO₂, 2.18% Al₂O₃ and 0.02% P. Additional drilling resulted in intersections ranging from 3 m @ 57.13% Fe, 13.85% SiO₂, 2.46% Al₂O₃, 0.01% P and 1.55% LOI to 3 m @ 61.96% Fe, 8.15% SiO₂, 1.82% Al₂O₃, 0.01% P and 1.23% LOI.
- Pelican Resources Limited commenced exploration for iron ore at the **Bellary Springs** prospect 20 km northeast of Paraburdoo in the Hamersley Basin. Initial fieldwork indicated the presence of pisolitic iron ore.
- Stellar Resources Limited reported that drilling at its **Coolybring** project near Taroona, SA, returned magnetite-bearing intersections from jaspilites and a variable sequence of ironstones and metasediments. Results included 114 m @ 39.2% Fe and 54 m @ 35.0% Fe, both under cover. Preliminary work showed that samples from both intersections could be upgraded to 53.4% Fe and 67.1% Fe respectively with

acceptable P₂O₅ and Al₂O₃ but with the former having elevated silica at 12%.

Mineral sands

Mineral sands exploration recovered from the slump that occurred in 2003-04 to rise by \$3.8 million to a total of \$27.6 million. Western Australia dominated spending with \$14.8 million and \$5.1 million was spent in South Australia. They were followed by New South Wales and Victoria with \$3.1 million each and the Northern Territory with \$1.6 million. While much of the activity focused on the established mineral sands provinces such as the Murray Basin, there was significant activity in relatively new mineral sands regions on the Tiwi Islands, Northern Territory and the Eucla Basin of South Australia (Figure 4).

- Bemax Resources Limited announced the discovery of the **Campaspe** mineral sands deposit in the Murray Basin. They reported an Inferred Resource of 106 Mt @ 4.26% heavy minerals (HM) with the HM component being

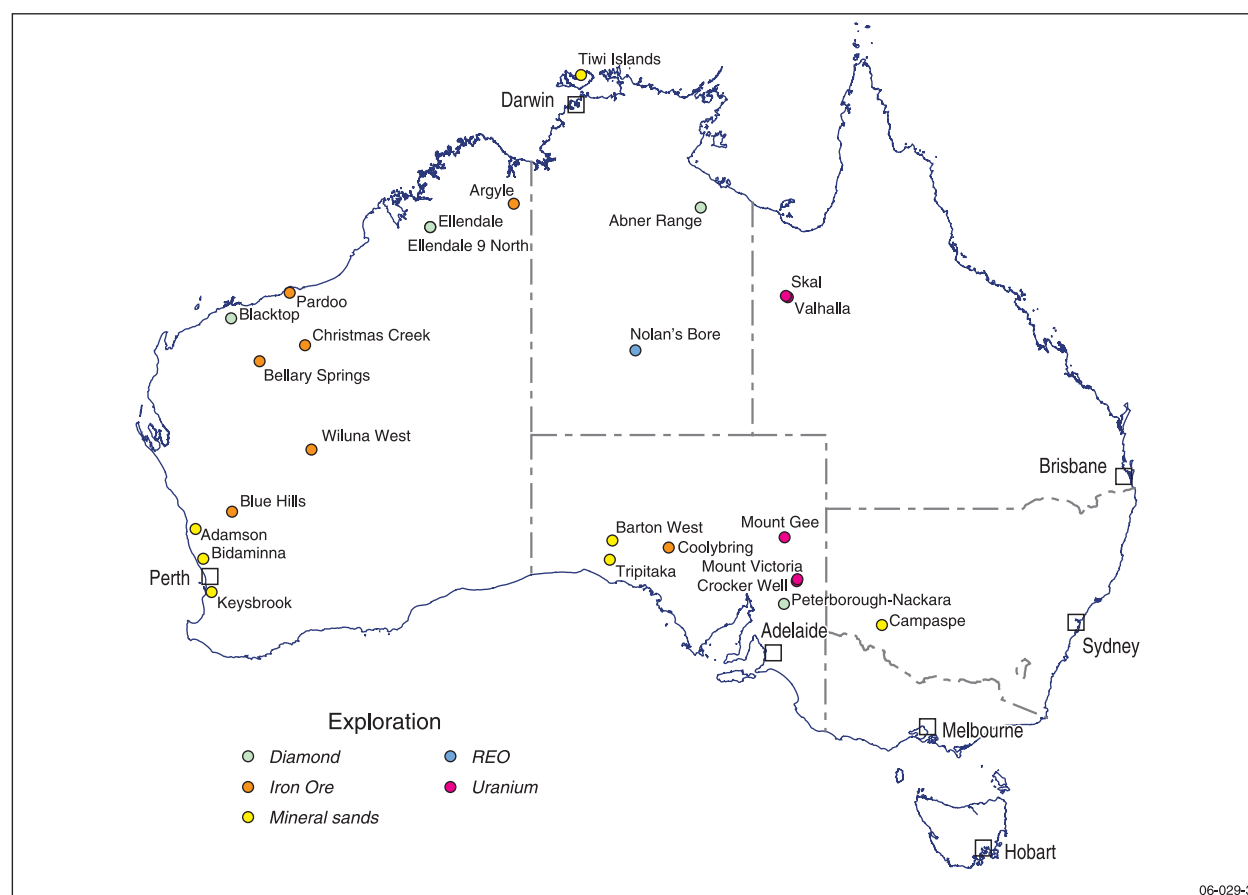


Figure 4: Selected mineral exploration projects, 2005.

12% rutile, 18% zircon and 62% ilmenite. Drilling to the north of Campaspe returned 11 m @ 5.2% HM. Another zone was encountered south of Campaspe that gave an intersection of 18 m @ 3.21% HM from 36 m.

- Matilda Minerals Limited was granted mining leases by the Northern Territory Government over the zircon-rich Andranangoo and Lethbridge Bay mineral sands deposits on the **Tiwi Islands** some 60 km north of Darwin. The ore reserve is 4.9 Mt @ 4.5% HM. A Notice of Intent to mine was lodged with the Northern Territory Government in April. Construction of the gravity processing plant for the Tiwi Islands is on schedule and within budget. Matilda has an off-take agreement with Astron Limited to purchase the entire production from the project. In March 2005, Matilda announced the results of a feasibility study into the production of zircon and rutile concentrate on the Tiwi Islands. The Northern Territory Minister for Mines and Energy has granted the company a 25-year lease for the prospect on the north coast of Melville Island. The lease area of 821.7 hectares covers the current Reserves and Resources and the known extensions of the mineralisation at the Andranangoo Creek West prospect.
- Adelaide Resources Limited announced the discovery of several zones of >1% HM in four of seven widely spaced reconnaissance drill traverses at the **Tripitaka** Prospect within the Colona Joint Venture tenements in the Eucla Basin, northwest of Ceduna and adjacent to Iluka's Jacinth and Ambrosia deposits. Indicative mineralogy from two traverses is: 5084SE 63% zircon, 17% leucocoxene and 7% ilmenite with significant intersections including 18 m @ 3.8% HM and 15m @ 2.9% HM; and 5085SE is 68% zircon, 12% leucocoxene and 11% ilmenite with significant intersections including 15.5m @ 4.9% HM and 21 m @ 5.6% HM.
- Dominion Mining Limited intersected potentially significant mineral sands at its **Barton West** (Notrab) prospect in the Eucla Basin northwest of Ceduna, SA. Intersections reported included 16 m @ 2.64% HM in unconsolidated sands from 8 m and 13 m @ 2.23% HM from 8 m. Follow up drilling yielded similar results. Initial mineralogical work suggests that ilmenite is dominant at 48.7-71.9% of the heavy minerals with

leucocoxene at 4.9-22.2%, zircon 4.0-15.6% and rutile 2.4-6.6%.

- The discovery of two new resources was reported from the **Keysbrook** project in southwestern WA, by Olympia Resources Limited. In the Keysbrook South deposit, 4 km south of the Keysbrook project, the company reported Indicated Resources of 13.6 Mt @ 2.24% HM for a contained 305 000 t HM. At the Coolup deposit, 34 km south of the Keysbrook project, an Indicated Resource of 2 Mt @ 6.0% HM for 120 000 t HM was reported.
- Iluka Resources Limited announced an extension to resources at the **Eneabba** operations. The Adamson mineralisation has a total resource (Measured, Indicated and Inferred) of 35.8 Mt containing 1.7 Mt HM of which 44% is ilmenite, 15% zircon and 5% rutile.
- Image Resources NL reported that the first phase of ground magnetic surveys outlined a strike length of potentially high-grade heavy mineral sands within the **Bidaminna** project area, approximately 100 km north of Perth.

Diamond

ABS reported that exploration spending on diamond in 2004-05 fell by \$2.1 million to \$23.7 million. Western Australia accounted for \$15.9 million while the Northern Territory had \$5.2 million and South Australia \$1.8 million. Minor expenditure was also reported in New South Wales and Queensland.

- Blina Diamonds NL reported that limited trial mining (in conjunction with Kimberley Diamond Company NL) and large-scale bulk sampling of alluvial gravels in palaeo-channels draining the Ellendale 9 lamproite pipe at its **Ellendale 9 North** (Figure 4) project in the Kimberley region, WA, yielded 7288 carats (c) from 36 119 t of processed material at an average grade of over 20 carats per hundred tonnes (cpht). The average diamond size was 0.37 c but 8 stones in excess of 5 c were recovered, including a 9.92 c yellow gem, the largest found so far from alluvial material in the Ellendale area. An initial parcel was valued at US\$195/c.
- Kimberley Diamond Company NL continued sampling and evaluation of previously (1970s) and newly discovered lamproites in the vicinity of Ellendale 4 and 9 in its **Ellendale** mining lease. The latest lamproite

discovery, the 44th pipe discovered in the lease area, is a small body near Ellendale 9. Resources (as at 30 June) for Ellendale 4, 4S and 9 combined stood at 68 Mt @ 7.4 cpht.

- Gravity Diamonds Limited reported discovery of a new diamondiferous kimberlite pipe at its **Abner Range** project, NT. Following up a Falcon® gravity anomaly with ground gravity and limited drilling, the company defined the 1.3 ha ABN 021 kimberlite pipe and 0.3 ha satellite pipe. Gravity subsequently announced the recovery of a 0.147 c stone and 16 other diamonds greater than 0.4 mm diameter from drill hole samples. Bulk sampling and further exploration around ABN 021 is planned for 2006.
- Flinders Diamonds Limited reported that five of eight kimberlites in the **Peterborough – Nackara** area some 120 km northeast of Port Pirie, SA, had returned microdiamonds from trench samples. According to the company, 20 of 50 new kimberlites sampled in the past year are diamondiferous. Further targets have been identified for testing.
- Tawana Resources NL entered into an alliance with De Beers Australia Exploration Ltd (as Newco) and will process approximately 14 000 t from the **Blacktop** kimberlite dyke in the Pilbara region of WA where De Beers had previously recovered 5.27 c from a 32.85 tonne bulk sample. The program is targeted to support a feasibility study by the end of 2006.

Rare Earth Oxides

- Arafura Resources NL reported that drilling at the **Nolan's Bore** prospect, 130 km north of Alice Springs, had extended the strike length of mineralisation with new grades and widths intersected consistent with results from previous exploration. Intersections encountered included 40 m @ 3.5% Rare Earth Oxides (REO), 22% P₂O₅ and 0.61lb/t U₃O₈ from 46 m, 12 m @ 4.7% REO, 22% P₂O₅ and 0.54lb/t U₃O₈ from 90 m and 11 m @ 4.7% REO, 25% P₂O₅ and 0.75lb/t U₃O₈ from 153 m. In November, the company announced new Indicated and Inferred Resource estimates totalling 18.6 Mt @ 3.1% REO, 14% P₂O₅ and 0.47 lb/t U₃O₈. The company now predicts Nolan's Bore has a mine life of at least 30 years. The resource estimate will lead into a feasibility study due to start in early 2006.



Uranium

Uranium exploration expenditure almost doubled in 2004-05 to \$20.7 million in line with anticipated growth in demand. ABS reporting of expenditure in individual States is mixed for confidentiality reasons but limited data published shows that \$6.9 million was spent in the Northern Territory, \$0.3 million in Western Australia and \$0.4 million in Queensland. There was no expenditure reported in Victoria or Tasmania. Of the remaining States of New South Wales and South Australia it is considered that most of the unaccounted for spending would have occurred in South Australia.

- Exploration by Summit Resources Limited at its **Valhalla** and **Skal** prospects north of Mount Isa, Qld, returned high-grade uranium-vanadium intersections. At Valhalla a 106 m (downhole width) mineralised breccia included 10 m @ 6.07lb/t U_3O_8 and 4.5lb/t V_2O_5 and 53 m @ 2.5lb/t U_3O_8 and 1.83lb/t V_2O_5 . At Skal, the Company reported a 30 m mineralised breccia which included 5 m @ 1.54lb/t U_3O_8 , 2.26lb/t V_2O_5 and 0.73% Cu, 8 m @ 1.71lb/t U_3O_8 , 0.93lb/t V_2O_5 and 0.45% Cu and 6 m @ 2.59lb/t U_3O_8 and 3.02lb/t V_2O_5 .
- Marathon Resources Limited announced resource estimate for the **Mount Gee** deposit in the North Flinders Ranges, SA. The uranium resource totals 33 200 t U_3O_8 in the inferred category and there is a lanthanum-cerium resource of 51 800 t La-Ce also in the inferred category.
- Inferred Resources totalling 12.65 Mt @ 0.053% U_3O_8 were reported by Pepinnini Minerals Limited from the **Crocker Well** and **Mount Victoria** deposits in South Australia, 120 km west of Broken Hill. In the Crocker Well area uranium reportedly occurs principally as thorian brannerite and at Mount Victoria it usually occurs as davidite.

PROJECT DEVELOPMENT

Strong demand for mineral commodities provided the impetus for a number of developments to progress in 2005. The following examples illustrate the range of projects that were in progress in 2005 (Figure 5).

Copper, lead, zinc, silver

- Tritton Resources Limited commissioned the **Tritton** mine in NSW. The mine development was completed within budget and on schedule and performed strongly through the year. Regional exploration continues to identify high-grade results including 21.5 m @ 7.6% Cu and 0.4 g/t Au.
- The **Whim Creek** copper mine, 110 km south of Port Hedland, WA, operated by Straits Resources Limited, commenced production of copper in May. Straits anticipates a quick ramp up to full production with 15 000 to 17 000 t of copper to be produced in 2006. Drilling targeting deep mineralisation returned 60 m @ 2.6% Cu, 0.8% Pb, 0.2% Zn, 19g/t Ag and 0.4g/t Au close to the base of the planned open pit.
- CopperCo Limited has completed a bankable feasibility study for the development of the **Lady Annie** project, north of Mount Isa, Qld. The ore reserve stands at 9.8 Mt @ 1.2% Cu for 117 000 t Cu, and incorporates the Lady Annie, Mount Clarke and Flying Horse deposits, which have a combined oxide resource of 15.8 Mt at 0.9% Cu. Mining will be by open cut and the ore will be treated by heap leaching and solvent extraction-electrowinning. CopperCo has been granted a \$1.5 million secured mezzanine financing facility by LinQ Resources Fund to purchase second-hand SX-EW plant. This is additional to a \$2.5 million financing facility from LinQ to continue exploration in the area. CopperCo has indicated that initial production of 15 000 t of Grade 'A' copper cathode per annum will commence at Lady Annie in late 2006, before rising to 18 000 tpa.
- At Macmin Silver Limited's **Twin Hills** Silver Mine near Texas, Qld, construction was delayed by adverse weather conditions. A grade control drilling programme in the central part of the Twin Hills ore body aims to delineate the initial 200 000 t of ore to be mined. Construction was scheduled for completion by the end of 2005 with commissioning of the plant due in early 2006.
- Jabiru Metals Limited announced a \$5.0 million finance facility to ensure it was adequately funded while finalising the proposed \$55 million financing facility for the development of the **Jaguar** deposit near Teutonic Bore, WA. The Jaguar project is forecast to produce 25-30

000 t Zn in concentrate, 8-10 000 t Cu in concentrate and 0.8 Mozs Ag in concentrate over a 5-year life. Work on the project progressed with digging of the box-cut started in November.

Diamond

- In December Rio Tinto Limited announced the decision to develop a US\$760 million block cave underground project at its Argyle diamond mine in the Kimberley region, WA. An additional US\$150 million will be spent on a related open pit cutback to enable production to continue between the cessation of open pit mining in 2008 and the ramp up of the underground mine. Development work associated with the present exploratory decline will continue, with construction of the underground mine to begin once government approvals have been finalised. Average annual production over the life of the underground mine from 2007 to 2018 is expected be about 60% of Argyle's historical annual average of 34 Mc and of similar quality.
- Kimberley Diamond Company NL (KDC) is spending \$48 million on a new 4.4M Mtpa plant at Ellendale 4 that will increase Ellendale production to 7.2 Mt and 700,000 c pa commencing in April 2006. KDC is also raising funds for a proposed two-stage upgrade of its 2.2 Mtpa Ellendale 9 East plant with the 3.3 Mtpa first stage planned for the second quarter of 2006 and further expansion to 4.4 Mtpa.
- North Australian Diamonds Limited (formerly Striker Resources NL) reported that it had recovered over 12 000 c, including 3 diamonds exceeding 10 c, from reprocessing of x-ray sorthouse tailings at its Merlin mine, NT. These non-fluorescing diamonds had an average value of US\$104 ct but included fancy yellow and both gem and near gem white diamonds. The company is processing stock piled remnant ore as well exploring prospects in the Merlin region.

Gold

New South Wales

- Barrick Gold Corporation continued construction of the **Cowal** Project, located near West Wyalong. Construction began in the fourth quarter of 2004 and stripping for the north tailings storage facility has been completed and construction of the first lift has been initiated. Annual gold production is expected to average approximately 230 000 ozs at an average total cash cost of about \$240/oz over the first three years with production expected to commence in early 2006.

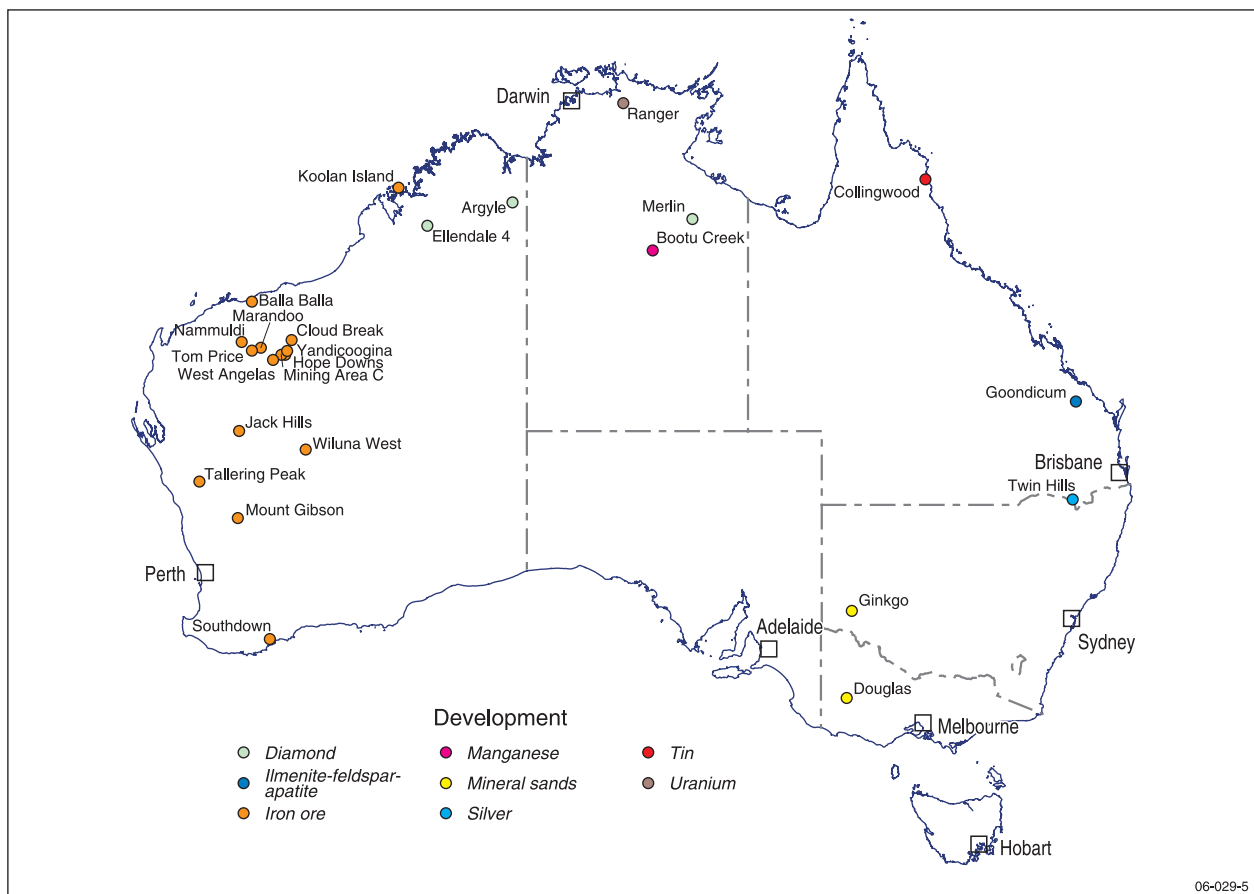
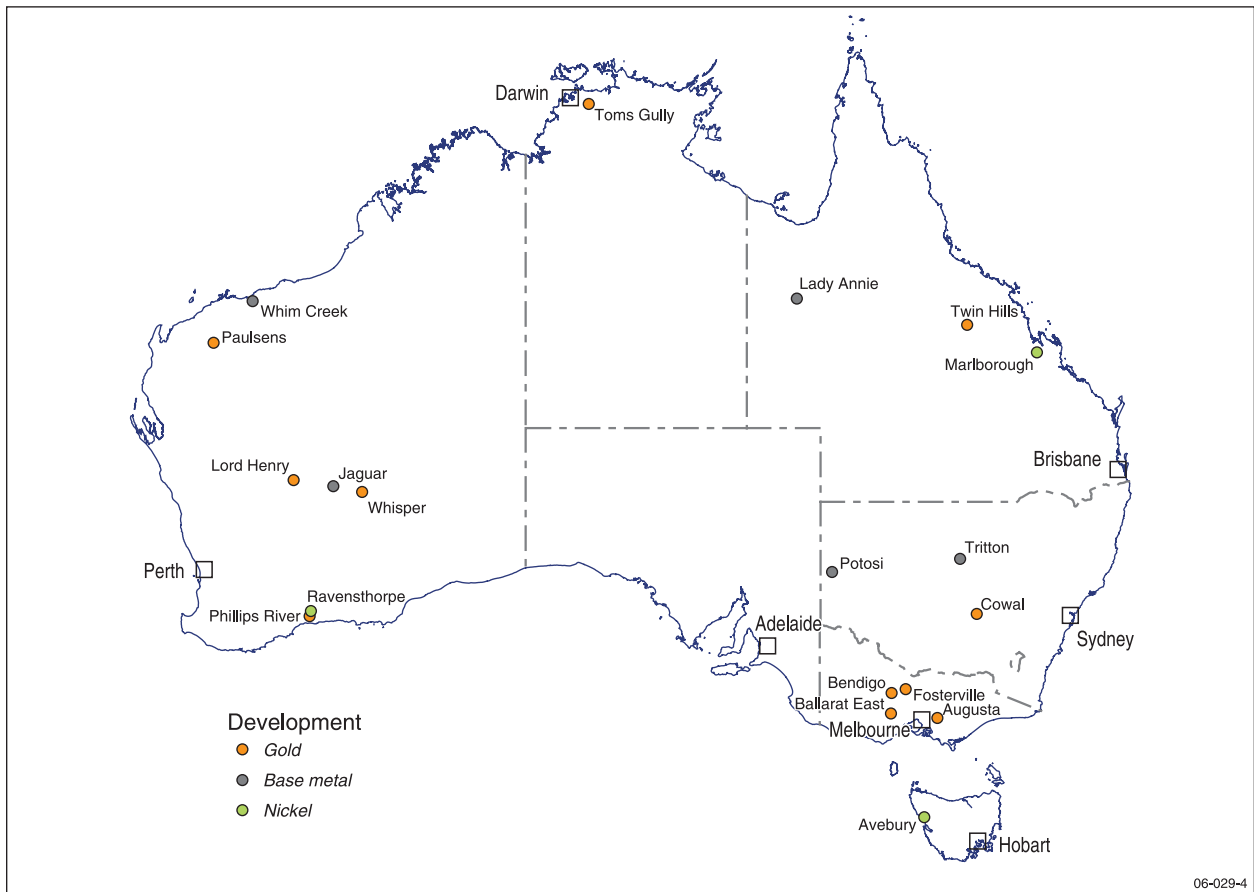


Figure 5: Selected mineral development projects, 2005.

Northern Territory

- Renison Consolidated Mines NL announced that it had completed financing arrangements for the development of the **Toms Gully** mine, 90 km southeast of Darwin. The project will be a 45 000 ozs per annum underground mine where mining commenced in October with gold production expected in March 2006. Development and operation of the mine is to be by PT Petrosea Tbk, a subsidiary of Clough Limited, under the terms of an Alliance Agreement with Renison. Petrosea has taken an equity investment in Renison. Additional drilling aimed at adding resources and upgrading inferred resources to the indicated category returned high-grade intersections including 2.2 m @ 10.7g/t Au, 1.3 m @ 15.3g/t Au and 1.5 m @ 11.3g/t Au.

Queensland

- BMA Gold Limited continued development of its **Twin Hills** gold mine in central Queensland with the first ore produced in December. The treatment plant from Rishton, near Charters Towers, was refurbished and successfully commissioned using waste material. Mining commenced in the 60 m deep Area 1 zone which has reserves of 24 000 t @ 18.9g/t Au. Treatment of the first ore was scheduled for December, as was development of the 100 to 300 m deep Area 2 zone, with reserves of 261 000 t @ 25.6g/t Au. Drilling has continued in the shallow Area 3 zone, which has a resource of 196 000 t @ 8.3g/t Au and is more suited to open cut mining. Intersections included 6 m @ 22.9g/t Au, 6m @ 10.4g/t Au, 1 m @ 83.2g/t Au and 3 m @ 19.1g/t Au.

Victoria

- Bendigo Mining Limited announced in May that construction of the plant for the **Bendigo** project commenced and that commissioning was scheduled for the June quarter 2006 at an annual production rate of 0.12 Mozs. The company expects production to increase to over 0.5 Mozs annually from 2011.
- Ballarat Goldfields NL commenced underground development at **Ballarat East** in November 2004 and accessed the first mining block in September 2005. It commissioned the processing plant and poured the first gold in December 2005.
- Bendigo City Council issued A.G.D. Mining Limited a permit for the establishment and operation of the **Augusta** gold-antimony open pit mine near Costerfield in central Victoria. The project will commence mining in early 2006 with production due by early in the second quarter 2006. Plant construction commenced in December 2005.

- Perseverance Corporation Limited poured the first gold from its new production facility at **Fosterville**, east of Bendigo, in May. At the end of June mechanical commissioning of all circuits was completed and process commissioning was continuing with close to 90% gold recovery being achieved at that time.

Western Australia

- Nustar Mining Corporation Ltd poured the first gold at its **Paulsens** mine in the Ashburton region. The mine is expected to produce 80 000 ozs per year over its initial five-year life and current Inferred Resource may support a longer life.
- Troy Resources NL commenced mining at the Lords project near Sandstone, some 15 months after the discovery of the **Lord Henry** and Lord Nelson deposits. Annual production is expected to be 60 000 ozs.
- The positive results of a feasibility study on the **Phillips River** gold project caused Tectonic Resources NL to proceed with the project. The study was based on seven open pits in the Kundip area, one in the Trilogy area which were to be followed by three underground mines at Kundip. It is anticipated that the project will have an initial 4.5 year milling life. Output is expected to rise from 48 000 ozs in the first year to a peak of 80 000 ozs in the fourth year of operation.

Ilmenite-feldspar-apatite

- Monto Minerals Ltd will produce three separate feldspar, ilmenite and apatite products from the **Goodicum** Crater industrial minerals project at Mt Goodicum near Gladstone, Qld. The high alumina feldspar (>27%) contains no silica and is acceptable in glass making and has further potential in paint and powder coating applications. The project was given the go ahead in June and is expected to be in production with commercial sales by the June quarter 2006.

Iron ore

- BHP Billiton Limited commenced construction on its expansion of capacity at **Mining Area C**, in the Pilbara, WA, in October. When finished in 2007 capacity at that operation will be 42 Mtpa and will increase the Company's capacity to 129 Mtpa.
- Rio Tinto Limited's Hamersley Iron Pty Ltd completed the

US\$200 million expansion of the **Yandicoogina** operation, WA, from 24 to 36 Mtpa in August. Work to further increase capacity to 52 Mtpa started late in the year with completion scheduled for 2007. The cost of this project is reported to be US\$530 million.

- In April Rio Tinto Limited announced that it would spend US\$290 million to further expand its existing iron ore mines in the Pilbara region, WA. The expansion of the **Tom Price** and **Marandoo** mines and new capacity at **Nammuldi** is expected to start commissioning early in 2006. It will add about 15 Mt/year to capacity for at least three years.
- Robe River Associates' US\$105 million **West Angelas** expansion to 25 Mtpa was completed in mid-year. A feasibility study into the development of Mesa A as a replacement for the Mesa J mine is in progress. Robe is reviewing plans to raise the capacity of its port facilities at Cape Lambert to 80 Mtpa.
- A 50:50 joint venture was formed between Hancock Prospecting Pty Limited and Rio Tinto Limited to develop the **Hope Downs** iron ore deposits, 75 km northwest of Newman, WA. The agreement also covers the East Angelas 1, 2 and 3 deposits. The resources include both Marra Mamba and Brockman-type ores and total 850 Mt including 450 Mt in the reserve categories.
- Mount Gibson Iron Limited announced that it had signed a Participation Agreement with the Chinese company Shougang Holding (Hong Kong) Ltd to jointly develop the **Mount Gibson** magnetite resources located 35 km north northeast of Perth. A bankable feasibility study investigating the feasibility of producing 5 Mt annually of magnetite concentrate over 20 years was scheduled for completion in December 2005. Approval was received from Chinese authorities for the construction of a 2.5 Mtpa pellet plant at the new port of Longtan on the Yangtze River. It is proposed to use magnetite concentrate from the Extension Hill project as feed for the plant.
- Fortescue Mining Group Limited undertook trial mining at its **Cloud Break** deposit late in the year using a Wirtgen surface miner. In August the company released the results of the "Infrastructure Definitive Feasibility Study" into the projects rail, port and mine facilities which indicated that for a 45 Mtpa operation the capital costs would be \$1.95 billion.

- Mount Gibson Iron Limited's **Tallering Peak** mine near Mullewa, WA, will have capacity increased from 2.3 to 3.0 Mtpa from early in 2006.
- A \$13 million Bankable Feasibility Study into the **Southdown** magnetite deposit commenced in 2005 and is scheduled for completion in early 2006. Grange Resources Limited is examining the potential to produce 6.5 Mtpa of magnetite concentrate that will be pumped via a slurry pipeline 90 km to Albany for export.
- Murchison Metals Limited is developing the **Jack Hills** high-grade hematite deposit, 380 km northeast of Geraldton, which has a total Measured plus Inferred resource of 67 Mt. The Company proposes to develop the operation in two stages with Stage 1 based on contract mining of Jack Hills and shipping ore through Geraldton. The total funding required for Stage 1 is \$40 million which will allow annual production of 1.2 Mt from early 2006 and increasing to 1.8 Mtpa in 2007. Stage 2 of the project would see production rising to 25 Mtpa.
- Positive results from a bankable feasibility study on the **Koolan Island** iron ore project were reported by Aztec Resources Limited. An initial capital cost of \$108 million would be required and would generate total revenues of \$1.4 billion over a nine year mine life. At full production the project would supply about 4 Mtpa and Aztec has MOUs signed for 3.4 Mtpa. The aggregate resource at Koolan Island is 47 Mt @ 64.7% Fe, 5.3% SiO₂ and 1.0% Al₂O₃.
- Aurox Resources Limited announced that it had received State Government approval to mine iron on its **Balla Balla** tenements midway between Port Hedland and Karratha, WA. The company has a titanomagnetite resource of 306 Mt @ 43% Fe which can be upgraded to 61% Fe by conventional crushing, grinding and magnetic separation.

Manganese

- OM Holdings subsidiary Bootu Creek Resources has secured funding for the development of its **Bootu Creek** project 110 km north of Tennant Creek, NT. The current reserve is 5.6 Mt @ 26% Mn with resources of 11.1 Mt at 28% Mn. The mine is expected to produce 550 000 – 600 000

t of manganese ore per annum, comprising 75% lump and 25% fines. Commissioning of the plant is scheduled for March/April 2006. The total project cost has been put at \$41.2 million.

Mineral sands

New South Wales

- Bemax Resources NL reported that development of the Pooncarie mineral sands project based on the **Gingko** deposit, NSW, and the **Broken Hill** Mineral Separation plant is on schedule and on budget. In November, the company announced that flooding of the mining pit had been completed and that wet commissioning of the dredge and wet plant was to start in early December. Commissioning of the mine was scheduled for December 2005 and the Broken Hill plant in February 2006 with first sales in the first half of 2006. The Pooncarie budget is \$176.4 million.

Victoria

- Construction activities for Iluka Resources Limited's **Douglas** project are proceeding. Ore for fifteen months of production has been exposed in the mine and construction of the wet concentrator plant completed with wet commissioning in progress in December. Full-scale production is scheduled for mid-2006 following the completion of commissioning activities.
- Astron Limited successfully completed a trial-pit to test mining and processing methods for the **Donald** Mineral Sands Project. The trial showed that Astron was likely to be able to mine using conventional earthmoving equipment.

Nickel

Queensland

- Gladstone Nickel Limited's **Marlborough** Nickel Cobalt project has been granted Significant Project status by the Queensland Government. The deposits contain reserves of 72.4 Mt at 0.82% Ni, 0.06% Co within a total resource of 188.5 Mt. Infill drilling has encountered new mineralisation at Gumigil East with intercepts of 24 m of 1.28% Ni and 0.02% Co, and 8 m at 1.12% Ni and 0.08% Co.

Tasmania

- Allegiance Mining NL received approval for its Development Application and Environmental Management Plan for the **Avebury** nickel project from the West Coast Council of Tasmania. These approvals and the granting of a Mining Lease by the Tasmanian Government mean that all key regulatory approvals have been received. In December the company announced that the feasibility study had returned positive results for a 5700 tpa nickel mine. Allegiance is to build a mill that is readily able to have capacity increased to 10 000 tpa nickel.

Western Australia

- BHP Billiton reported that construction of the mine and plant facilities at the **Ravensthorpe** lateritic nickel-cobalt mine are proceeding on schedule. The first shipment of mixed nickel-cobalt hydroxide intermediate product remains on schedule for the second quarter of 2007.

Tin

- At the Collingwood tin project, south of Cooktown, Qld, Bluestone Tin Ltd expected to ship its first cassiterite concentrates in December. Bluestone is owner-operator of the 3500 tpa mine, which it considers to be viable even at the current tin price. The old underground decline has been refurbished and ore developed from a number of headings. A new concentrating plant has been constructed. Collingwood has a Measured Resource of 942 000 t at 1.21% Sn.

Uranium

- An increased uranium spot price has allowed ERA to increase its reserves and resources and extend the mine life of Ranger mine, NT, by three years. The cut-off grade has been reduced from 0.12% to 0.08% U₃O₈, resulting in a 6285 t increase in reserves to 45 285 t and an increase in resources by 14 923 t to 42 992 t. The Ranger mine has operated for 25 years and is the second largest uranium mine in the world, providing 11% of world global output.



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