Overview of mineral and petroleum exploration and production in 2015

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Exploration statistics

Minerals

The ongoing downturn in minerals exploration continued in 2015 as lower commodity prices and a lack of investor confidence continues to impact on exploration budgets. According to Australian Bureau of Statistics (ABS) figures, mineral exploration expenditure in the Northern Territory (NT) in 2014-15 was $95.7 million, down 19% from $118.4 million in 2013-14 (**Figure 1**). However, the NT increased its share of Australian exploration relative to other jurisdictions. For the first time since 2003/04, mineral exploration expenditure in the NT in 2014/15 was higher than South Australia's expenditure ($86.2 million). Mineral exploration expenditure Australia-wide in 2014/15 was $1.58 billion, down 24% from the $2.07 billion the previous year. NT had a steady increase in expenditure classified by the ABS as greenfields (away from known deposits) with a 19% increase in greenfields expenditure from $23.2 million in 2013/14 to $27.6 million in 2014/15. Over the same period, Australia-wide greenfields exploration dropped by 29%.

In terms of exploration by commodity (**Figure 2**), a collapse in iron ore exploration expenditure in 2014/15 was partially offset by substantial increases in exploration expenditure for gold ($35.4 million, up 28%) and base metals ($8.7 million, up 30%).

At the end of 2015, there were 905 granted non-extractive mineral exploration licences (compared with 1050 at the end of 2014) and 746 outstanding exploration licence applications. During 2015, 195 applications were received, 120 granted and 440 licences were relinquished.

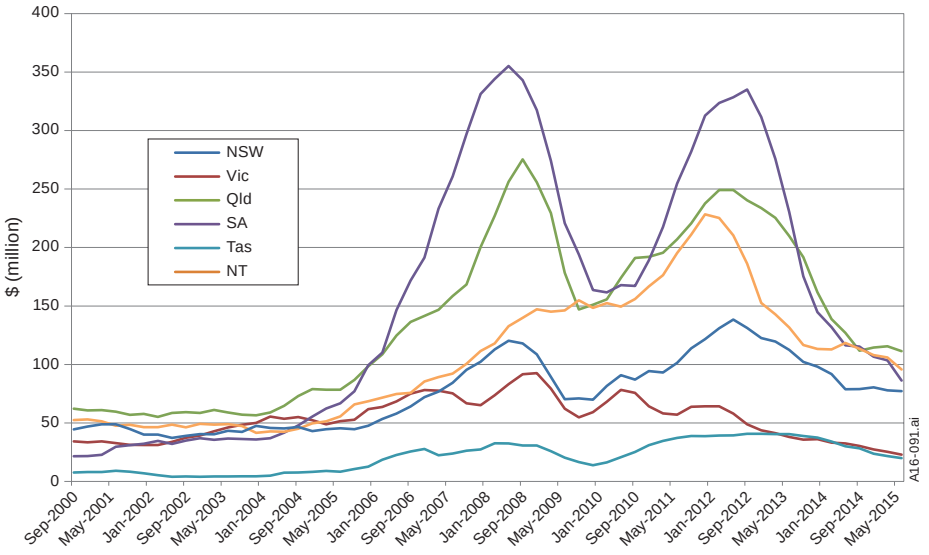

Figure 1. Annual exploration expenditure for all minerals except coal and petroleum, for all Australian states (excluding Western Australia, who has $917.7 million in expenditure in 2014/15) calculated quarterly, for the 16 years to the June 2015 quarter.

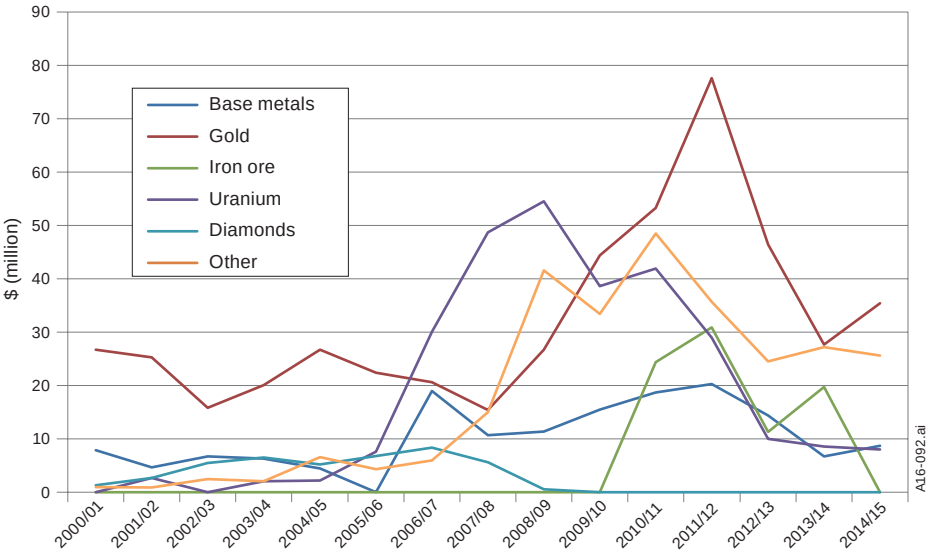

Figure 2. Breakdown of exploration expenditure by commodity as measured by ABS, for each financial year from 2000/2001 to 2014/15.

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Petroleum

Petroleum exploration activity, whilst affected by the sharp downturn in oil and gas prices, remains at relatively high levels in the onshore NT. ABS exploration expenditure figures combining both onshore and offshore petroleum exploration for the NT (including substantial areas of the offshore Bonaparte and Browse basins) indicate expenditure of $510.0 million in 2013/14, but are not available for 2014/15 as insufficient companies reported expenditure in the first two quarters of 2015 for the ABS to release results.

Expenditure reported to DME for onshore exploration in the NT during 2015 was approximately $121.2 million. At the end of 2015, in the onshore NT and coastal waters, there were 54 active exploration permits, 3 retention licenses and 5 production licenses.

Exploration and production highlights

Figure 3 shows selected exploration highlights for 2015. In the following summary of exploration and mining results for the Territory during 2015, all mineral resources are assumed to have

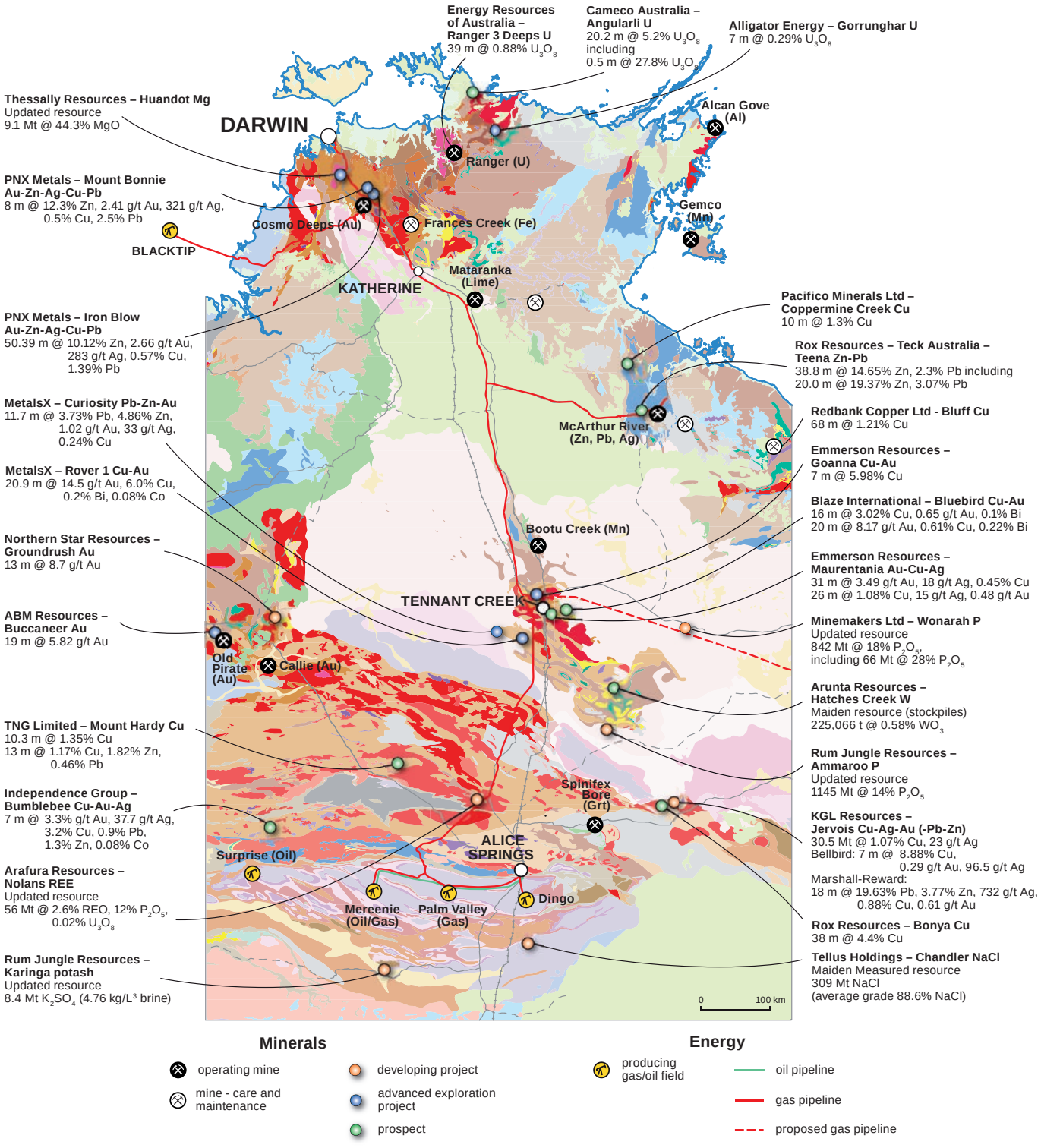

Figure 3. Map of the Northern Territory showing selected mineral exploration highlights for 2015.

been reported in accordance with the JORC or NI43-101 codes. Where resource categories are not listed, readers are directed to the original sources for this information. Most material cited here has been sourced from company websites, news releases and Stock Exchange announcements by companies. As a result, details of exploration by some private and other non-listed companies that do not report publicly could not be included. Mineral production statistics for the NT for 2014/15, collected under the NT *Mineral Titles Act*, are given in **Table 1**.

Gold and copper-gold

Pine Creek Orogen

Newmarket Gold Incorporated (formerly Crocodile Gold Australia Pty Ltd) continued gold production from their ***Cosmo Deeps*** underground mine north of Pine Creek (**Figure 4**). Gold production from Cosmo Deeps in 2015 totalled 63 255 oz at an average grade of 2.99 g/t from 725 002 t milled, a 19% decrease in production from 2014. At the end of 2014, the Mineral Resource for Cosmo mine included a Measured Resource of 1.56 Mt at 3.68 g/t Au, an Indicated Resource of 3.45 Mt at 3.20 g/t Au and an Inferred Mineral Resource of 0.96 Mt at 2.72 g/t Au, for a total contained mineral resource of 0.62 Moz of gold. Newmarket undertook 16 700 m of exploration drilling around Cosmo Deeps during 2015, targeting new lodes outside the current mine plans. Drill intersections included 11.4 m at 14.79 g/t Au from the Silver Lode, 4.32 m at 7.42 g/t Au from the Western Lodes, 7.54 m at 5.33 g/t Au from the Inner Dolerite Target and 22.75 m at 4.34 g/t Au from the 'Central Internal Metasediments'. Drilling of down-plunge extensions 200 m below the current base of the Mineral Resource intersected 5.7 m at 5.85 g/t Au.

In May 2015, Newmarket commenced a preliminary economic assessment on the ***Maud Creek*** project, which has an Indicated Mineral Resource of 7.7 Mt at 3.50 g/t Au for 871 000 oz and an Inferred Mineral Resource of 4.2 Mt at 2.50 g/t Au for 343 600 oz gold. In late 2015, Newmarket announced that they were commencing an 87 hole, 5740 m drilling program at the ***Esmeralda*** project, 7 km southeast of Union Reefs. Esmeralda has Inferred Mineral Resources of 1.06 Mt at 2.06 g/t Au

Primary Gold Ltd continued to progress approvals for their ***Toms Gully*** gold project located 100 km east of Darwin. Toms Gully contains Indicated and Inferred Mineral Resources of 1.1 Mt at 8.9 g/t Au containing 315 000 oz. This forms part of larger resource for their ***Mount Bundey*** project area of 41.35 Mt at 1.1 g/t Au for a contained 1.43 Moz of gold. Mineralisation at Tom's Gully occurs in a shallowly dipping quartz-sulfide vein hosted within graphic shale and siltstone of the Wildman Siltstone. The vein dips at around 30° south at the surface, to near horizontal at 280 m depth.

The ***Spring Hill*** gold deposit, 25 km north of Pine Creek, is hosted in greywacke and siltstone of the Mount Bonnie Formation, with gold occurring mainly in quartz veins that are concentrated in fracture zones and the axial zones of anticlines. The deposit has an Indicated Mineral Resource of 4.0 Mt at 2.32 g/t Au for a contained 300 000 oz gold at a 1 g/t Au cut-off grade; it and remains open at depth. During 2015, Thor Mining PLC acquired the balance of the

Table 1. 2015 Northern Territory mining production.

Commodity	Unit of Quantity	2014–15[1,5]		
		Quantity Produced[2]	Quantity Sold[3]	$ Amount for Quantity Sold[4]
Metallic Minerals				
Alumina[6]	Tonnes	0	27,500	$8,601,340
Alumina Hydrate[6]	Tonnes	0	63,625	$20,705,912
Bauxite[7]	Tonnes	6,870,769	6,987,336	$368,732,008
Gold[8]	Grams	521	0	$0
Gold Dore[9]	Grams	14,572,595	14,749,758	$684,282,128
Iron Ore	Tonnes	901,028	1,241,362	$64,603,193
Manganese	Tonnes	5,695,710	5,407,585	$971,889,435
Mineral Sands	Tonnes	0	0	$0
Lead Concentrate	Tonnes	20,240	2,023	$2,372,811
Zinc Concentrate	Tonnes	159,673	184,951	$189,831,981
Zinc Lead Concentrate	Tonnes	424,777	444,585	$490,633,521
Metallic Minerals Value				**$2,801,652,329**
Non-Metallic Minerals				
Crushed Rock	Tonnes	2,458,360	2,343,356	$52,026,041
Dimension Stone	Tonnes	6,000	3,500	$112,000
Gravel[10]	Tonnes	812,260	771,354	$8,721,337
Limestone	Tonnes	0	0	$0
Mineral Specimen	Tonnes	0.75	0.45	$89,310
Quicklime[11]	Tonnes	0	0	$0
Sand	Tonnes	811,206	772,664	$17,429,665
Soil	Tonnes	30,346	24,186	$570,995
Vermiculite	Tonnes	0	0	$0
Non-Metallic Minerals Value				**$78,949,348**
Energy Minerals				
Uranium Oxide	Tonnes	2,025	2,868	$376,270,811
Total Minerals Value				**$3,256,872,488**

Explanatory Notes

1. Fiscal year is 1st July to 30th June.
2. Data is from production returns lodged by operators under statutory obligations.
3. Amount for Quantity Sold is in Australian Dollars and presumed to be the gross amount paid to the operator.
4. Data has been rounded and autosum applied.
5. Data is correct as at 30 Sept 2015 and may be subject to revision due to late lodgements and/or receipt of superior data.
6. Alumina and alumina hydrate are derived from bauxite. Processing input and output data is deemed operator commercial-in-confidence.
7. Quantity produced represents total bauxite production. Quantity sold and $ excludes input for alumina production. Processing input and output data is deemed operator commercial-in-confidence.
8. Pure gold (100%); does not include gold reported as gold dore.
9. Estimated metallic content of gold dore is 92.0% gold and 8.0% silver.
10. Average sales values have been applied to some non-metallic minerals if this information was not supplied.
11. Quicklime is derived from limestone. Processing input and output data is deemed operator commercial-in-confidence.

equity in the project to take 100% ownership. No further exploration was reported on the project in 2015.

Vista Gold Corporation (Vista) continued water management, permitting and project optimisation work at their ***Mount Todd*** project, northwest of Katherine. Mineralisation at Mount Todd is contained in a stockwork of quartz veins and their margins, hosted within metamorphosed interbedded siltstone, shale and minor tuff of the Burrell Creek Formation. Mineral resources at Mount Todd include Measured and Indicated Mineral Resources of 279.6 Mt at 0.82 g/t Au containing 7.40 Moz of gold, and Inferred Mineral Resources of 72.5 Mt at 0.74 g/t Au containing 1.73 Moz of gold. Proven and Probable Ore Reserves are 222.8 Mt at 0.82 g/t Au containing 5.90 Moz of gold. During 2015 Vista undertook conceptual drilling on three targets, two of which were within the Mt Todd exploration license areas and the other of which was below the Batman deposit mineralised zone; results from the drilling have not yet been announced.

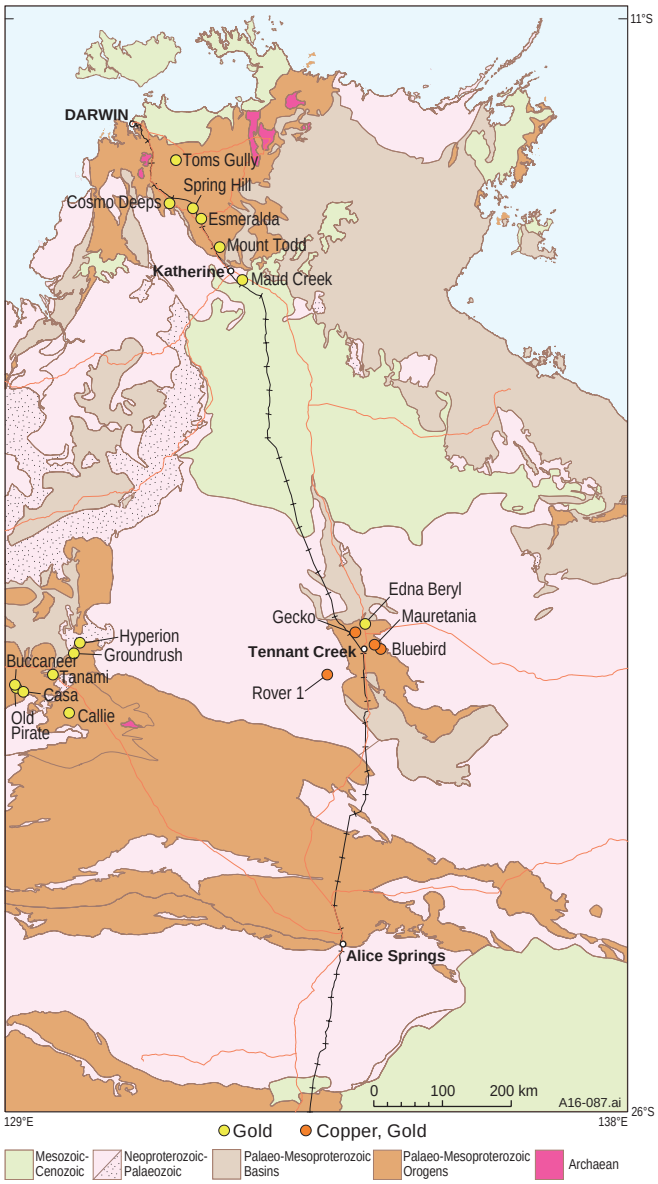

Figure 4. Location of gold and copper-gold deposits and projects mentioned in the text.

Tanami–Arunta regions

The Tanami gold province straddles the NT–Western Australia border. The ***Callie*** mine, located 550 km northwest of Alice Springs, is operated by Newmont Mining Corporation (Newmont) and produced 345 000 oz of gold during 2014. Mineralisation at Callie consists of high-grade Au-quartz veins in folded carbonaceous siltstone in the lower part of the Dead Bullock Formation. Callie was discovered in 1991 and mining commenced in 1995. As of 31 December 2014, the Proven and Probable Ore Reserves at Newmont's Tanami operations were 17.7 Mt at 5.80 g/t Au containing 3.31 Moz of gold, a 10% increase on the previous year's 3.01 Moz ore reserve. Additional Measured and Indicated Mineral Resources total 3.2 Mt at 5.63 g/t Au for 0.57 Moz Au and Inferred Mineral Resources are 9.2 Mt at 5.97 g/t Au for 1.76 Moz Au. In October 2015 Newmont announced plans for an expansion of their Tanami operation by building a second decline and increasing plant capacity. The expansion is predicted to increase production by 80 000 oz per annum, with planned future production of 425 000–475 000 oz per annum. The expansion is due to be completed and in full production by the second half of 2017.

In July 2015, Northern Star Resources Ltd (Northern Star) settled a purchase and farm-in agreement with Tanami Gold NL for the ***Central Tanami*** project. The project includes the historic ***Tanami*** goldfield, which produced 2 Moz of gold from 43 open cuts between 1987 and 2005. In January 2013 the total mineral resources for the Central Tanami project stood at 25.50 Mt at 3.2 g/t Au containing 2.63 Moz of gold, including the flagship ***Groundrush*** deposit with a Mineral Resource of 6.72 Mt at 4.8 g/t Au containing 1.04 Moz of gold. As part of the agreement with Tanami Gold, Northern Star acquired a 25% stake in the Central Tanami project and can increase its stake to 60% by sole funding the expenditure required to get the existing processing plant back into commercial production. In late 2015, Northern Star commenced a 20 000 m infill diamond drill program at Groundrush aimed at improving the confidence level of the existing resource by infill drilling down to a vertical depth of 300 m. The company reported that results from the first 22 holes were in line with expectations from previous drilling, with true width intersections including 13.0 m at 8.7 g/t Au from 200 m and 5.8 m at 6.8 g/t Au from 206 m. Northern Star are targeting returning the Central Tanami project into production in 2017 as a +125 000 oz per annum operation.

In 2015, ABM Resources NL (ABM) commenced production at their ***Old Pirate*** mine, 90 km west-northwest of Callie near the WA border. Mineralisation at Old Pirate occurs at the surface and comprises multiple, high-grade, gold-bearing quartz veins between 20 cm and 6 m in width over a 1.8 km strike length. Mineralised zones are up to 40 m in width and consist of multiple veins hosted mainly in shale horizons within an interbedded sandstone-shale succession. Prior to mining, Inferred and Indicated Mineral Resources at Old Pirate were estimated at 1.7 Mt at 11.7 g/t Au containing 640 000oz of gold. From the commencement of production in May until the end of 2015, 83 143 t of ore was mined from Old Pirate with an average grade of 6.3 g/t

Au, resulting in gold recovered of 18 592 oz. Production was significantly lower than expected, with mill reconciliation only accounting for 70% of mine-estimated gold production. The company reported that this was due to issues with the mining inventory model, loss and dilution experienced during mining and potential lock-up of gold within the processing plant. Mining at Old Pirate is expected to be complete in April 2016.

ABM also undertook a 15 000 m near-mine drilling program in the Twin Bonanza project area, including a 48 hole, 3305 m drilling program at the ***Buccaneer*** deposit, which has an existing Resource of 15.3 Mt at 2.23 g/t Au for 1.1 Moz Au. The program targeted near surface mineralisation and returned best intersections of 19 m at 5.82 g/t Au from 48 m, and 2 m at 33.6 g/t Au from 46 m. At ***Black Cat***, 22 km south west of Old Pirate, drilling beneath outcropping quartz veins intersected 3 m at 9.18 g/t Au from 13 m. At the ***Casa*** prospect, 11 km southeast of Old Pirate, the most northerly hole gave the best intersection of 3 m at 3.52 g/t Au from 65 m.

ABM also undertook a 45 hole aircore drilling program at the ***Hyperion*** deposit, 17 km north-northeast of Groundrush, which has an Inferred Resource of 2.98 Mt at 2.11 g/t Au. Infill drilling in the main Hyperion Central zone intersected 21 m at 4.42 g/t Au from 56 m; drilling along strike at Hyperion East identified potentially new zones of mineralisation with intersections including 21 m at 2.84 g/t Au from 13 m.

Warramunga Province (gold-copper-bismuth)

The Tennant Creek mineral field contains a number of high-grade, ironstone-hosted gold-copper orebodies that have historically produced around 4.5 Moz Au and 350 000t Cu. Tennant Creek-style orebodies are believed to have resulted from mineralised hydrothermal fluids passing along shear zones and reacting with Palaeoproterozoic iron-rich sedimentary rocks of the Warramunga Formation, resulting in what are now steeply plunging, zoned, high-grade Au-Cu-Bi sulfide orebodies.

Emmerson Resources Ltd (Emmerson) continued to explore the Tennant Creek mineral field as part of a major exploration joint venture with Evolution Mining (Evolution) under which Evolution can invest up to $25 million in exploration to earn up to 75% of the project. In late 2015, Emmerson announced the discovery of gold mineralisation at the ***Mauretania*** prospect, 17 km east-northeast of Tennant Creek. The initial RC drill program targeted an interpreted, but blind, northwest trending magnetic anomaly 400 m south of the former Mauretania mine. Significant intersections from this drilling included 30 m at 3.22 g/t Au, 13.1 g/t Ag, 0.33 % Cu and 723 ppm Bi from 57 m within an upper gold-rich zone, including 15 m at 5.67 g/t Au, 14.7 g/t Ag, 0.11% Bi, 0.24% Cu from 60 m, and 24 m at 1.07% Cu, 8.51 g/t Ag, 0.40 g/t Au from 78 m within a lower copper-rich zone. Emmerson consider the alteration, geochemistry and mineralogy at Mauretania is similar to the Nobles Nob deposit where high-grade gold is associated with silver, copper and bismuth within hematite ironstone. A follow-up drill program of 16 RC holes and two diamond tails intersected 15 m at 1.67 g/t Au from 98 m, and 14 m at 1.94% Cu from 118 m. In July 2015, Emmerson drilled a 1279 m deep hole to test for gold mineralisation at depth beneath the historic underground ***Gecko*** mine, co-funded with NTGS under the *CORE* initiative. The RC pre-collar to this hole intersected multiple zones of copper sulfide mineralisation associated with quartz-chlorite veins, analogous to mineralisation at the Goanna prospect, 800 m to the east; intersections returned 7 m at 5.98% Cu from 123 m including 3 m at 10.4% Cu. Additional zones of alteration with visible copper, pyrite and bismuth mineralisation were intersected at depth at approximately 400 m below the historic Gecko mine. In August, Emmerson entered into a mining tribute agreement with Edna Beryl Mining Company (EBMC) to allow small-scale narrow vein underground production to recommence at the historic, high-grade ***Edna Beryl*** mine subject to EBMC meeting all statutory requirements.

Following the acquisition of prospect-scale seismic at Gecko, Goanna and Chariot in 2014, Emmerson partnered with NTGS in mid-2015 to acquire a 60 km long north-south seismic traverse across the Tennant Creek mineral field.

In the eastern Tennant Creek field, Blaze International Ltd (Blaze) have a farm-in and joint venture agreement with Meteoric Resources Ltd over the Barkly copper-gold project, located 30 km east of Tennant Creek, which includes the ***Bluebird*** prospect. Bluebird is a 1.6 km long gravity ridge open to the east where shallow geochemical drilling by Meteoric Resources identified a 600 m long copper anomaly. Drilling at Bluebird in 2014 encountered Cu-Au-Bi mineralisation, with best intersections of 20 m at 8.17 g/t Au, 0.61% Cu and 0.22% Bi from 157 m, and 16 m at 3.02% Cu, 0.65 g/t Au and 0.1% Bi from 139 m. On-ground exploration in 2015 was limited to downhole EM surveys and field mapping.

The Rover field, 70 km southwest of Tennant Creek, has strong geological similarities to the Tennant Creek field with a number of Tennant Creek-style copper-gold deposits occurring under sediments of the Wiso Basin. The most advanced exploration project in the Rover field is the ***Rover 1*** deposit, which straddles tenements owned by Metals X (who have the majority of the defined orebody) and Adelaide Resources Ltd. The deposit has Indicated and Inferred Mineral Resources of 6.8 Mt at 1.73 g/t Au, 1.21% Cu, 2.1 g/t Ag, 0.14% Bi and 0.1% Co for a contained 1.22 Moz AuEq (gold equivalent), including a high-grade gold zone of 1.32 Mt at 7.01 g/t Au and 0.81% Cu. In 2015, Metals X drilled a parent hole (WGR1D060) at Rover 1 with a number of wedges, and intersected high-grade copper and gold within ironstone below the area of previous mining studies. Copper-gold drill intersections included 6.28 m at 19.83 g/t Au, 7.15% Cu, 0.67% Bi and 0.068% Co from 906 m and 5.46 m at 15.8 g/t Au, 4.03% Cu, 0.96% Bi, 0.06% Co from 937 m.

Copper, lead, zinc, silver

Arunta Region

During 2015, KGL Resources Ltd (KGL) continued exploration and assessment of the ***Jervois*** copper-silver-lead-zinc-gold project northeast of Alice Springs (**Figure 5**).

Mineralisation at Jervois occurs in a series of stratabound, subvertical, sulfide-rich deposits along a 12 km strike length in the Bonya Metamorphics in the Aileron Province. In the first half of 2015, a 11 000 m drilling program was completed at the Bellbird, Marshall-Reward and Green Parrot deposits targeting potential high-grade areas within the proposed open pits or close to planned underground development. Results included 4 m at 3.44% Cu, 2.95% Pb, 0.74% Zn, 252 g/t Ag and 1.76 g/t Au from 177 m at Green Parrot, 12 m at 2.6% Cu from 361 m at Bellbird, 3 m at 4.1% Cu, 0.82% Pb. 0.3% Zn, 189 g/t Ag and 0.29 g/t Au from Reward and 5 m at 6.12% Cu, 0.2% Pb, 2.42% Zn, 31 g/t Ag and 0.48 g/t Au from 263 m at Marshall. A shallow lead-zinc-silver zone was also intersected at Marshall-Reward, with 3 m at 7.76% Pb, 10.29% Zn, and 87 g/t Ag from 34 m. Following the drilling program, KGL announced a 21% increase in the resource at Jervois to 30.5 Mt at 1.07% Cu and 23.0 g/t Ag for 327 000 t of contained copper. This includes 10.6 Mt at 1.37% Cu at Marshall-Reward, and 5.4 Mt at 1.62% Cu at Bellbird, at a 0.75% Cu cut-off. The lead-zinc resource increased to 3.8 Mt at 3.7% Pb, 1.2% Zn, 0.72% Cu and 67.5 g/t Ag. In the second half of 2015, KGL drilled a number of exploration holes targeting anomalies defined by a 3D induced polarisation (3DIP) and magnetotelluric (MT survey). This included the deepest hole to be drilled at the Rockface prospect, which intersected 13 m at 2.14% Cu, 12.4 g/t Ag and 0.1 g/t Au from 253 m. In October 2015, KGL announced the results of a prefeasibility study on a development at Jervois that would produce 80–100 000 tpa of copper concentrate plus a separate lead-zinc bulk concentrate, with a mine life of 8.25 years based on the existing resource.

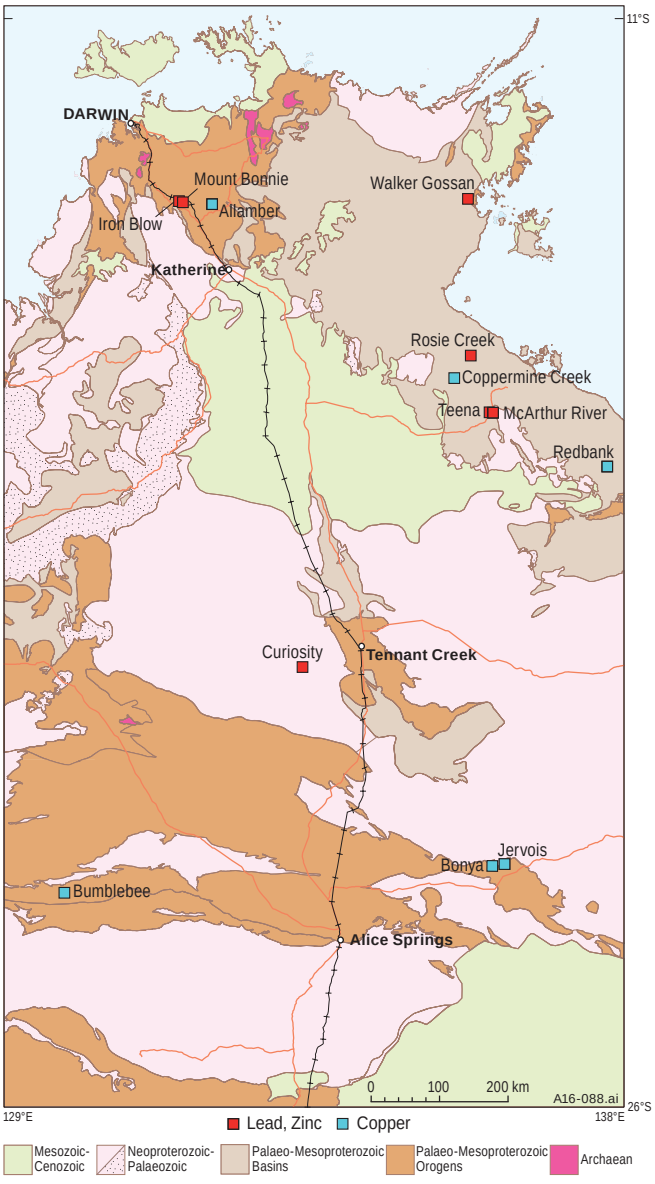

Figure 5. Location of copper and lead-zinc-silver depoits and projects mentioned in the text.

In late 2015, Rox Resources Ltd undertook a drilling program at the ***Bonya*** copper project in the Bonya Hills, west of Jervois, following up encouraging results from 2014 that included 38 m at 4.4% Cu from 60 m at the Bonya Mine prospect. Two RC holes were drilled at Bonya Mine in 2015 with one hole intersecting multiple intersections of copper sulfide mineralisation including 6 m at 2.6% Cu from 140 m. At the newly identified ***Green Gully*** (Marrakesh) prospect north of Bonya Mine, three shallow holes were drilled to test a 200 m long outcropping zone of copper mineralisation at surface, with a best intersection of 2 m at 3.2% Cu.

Core Exploration Ltd undertook the first drilling program in their Jervois domain project area, located immediately southeast of the Jervois mineral field, and intersected anomalous copper within the prospective Bonya Metamorphics at shallow depths.

As part of the Lake Mackay exploration alliance between ABM Resources and Independence Group NL, a new polymetallic copper-silver-gold-zinc discovery named ***Bumblebee*** was reported in the southwestern Aileron Province, 54 km northeast of Kintore. Bumblebee was initially identified as a multi-element soil geochemistry anomaly that strikes east-west for over 1 km. First drill results from the oxide, supergene and fresh-rock (sulfide) zones respectively at Bumblebee included 2 m at 7.4% Cu, 1.3 g/t Au, 34.6 g/t Ag, 1.3% Pb, 1.6% Zn and 0.09% Co from 25 m; 7 m at 3.2% Cu, 3.3 g/t Au, 37.7 g/t Ag, 0.9% Pb, 1.3% Zn and 0.08% Co from 30 m; and 5 m at 1.4% Cu, 2.4 g/t Au, 12.4 g/t Ag, 0.2% Pb, 1.0% Zn and 0.1% Co from 48 m. Mineralisation in fresh rock was associated with chalcopyrite, pyrite and magnetite; it appears to be south-dipping within an east-west trending structure. In December 2015, ABM and Independence group expanded their exploration alliance in the region and extended it for a further three years.

Warramunga Province

In late 2014, Metals X Ltd announced a new polymetallic mineral discovery at the ***Curiosity*** prospect in the Rover field located 100 km southwest of Tennant Creek. Mineralisation occurs in basement of the Warramunga Province underlying the Wiso Basin. Two holes, co-funded by NTGS under the *CORE* initiative, were drilled at Curiosity targeting coincident IP and magnetic anomalies. The holes intersected sulfide mineralisation (**Figure 6**) with a best intersection of 11.7 m at 1.02 g/t Au, 32.98 g/t Ag, 3.73% Pb, 4.86% Zn and 0.24% Cu from 473 m. The Curiosity prospect is 1 km southeast of the existing Explorer 108 polymetallic deposit, which has a resource of 11.87 Mt at 3.24% Zn, 2.0% Pb and 11.4 g/t Ag.

Pine Creek Orogen

PNX Metals Ltd (PNX, formerly Phoenix Copper Ltd) continued exploration and resource drilling at the Iron Blow and Mount Bonnie polymetallic gold-base metals deposits that occur within the basal Mount Bonnie Formation and Gerowie Tuff of the Pine Creek Orogen near Hayes Creek. At ***Iron Blow,*** which has an existing resource of 2.6 Mt at 2.4 g/t Au, 130 g/t Ag, 4.8% Zn, 0.9% Pb and 0.3% Cu, drilling results announced in early 2015 included a thick massive sulfide intersection that returned 50.39 m at 10.12% Zn, 2.66 g/t Au, 283 g/t Ag, 0.57% Cu and 1.39% Pb from 155.72 m; this includes 19.45 m at 15.48% Zn, 2.65 g/t Au, 492 g/t Ag, 0.56% Cu and 2.52% Pb from 156.5 m. Work at Iron Blow in 2015 focussed on metallurgical testwork to determine a production flowsheet to maximise recoveries of zinc, gold and silver. At ***Mount Bonnie***, a 12 hole, 1114 m RC drill program demonstrated grade and continuity within the deposit along with the potential of continuing mineralisation to the north-west; results included intersections of 8 m at 12.3% Zn, 2.41 g/t Au, 321 g/t Ag, 0.5% Cu, and 2.5% Pb from 89 m and 12 m at 8.4% Zn, 2.57 g/t Au, 228 g/t Ag, 0.7% Cu, and 2.0% Pb from 48 m. A follow-up 1560 m drill program discovered a new thick zone of mineralisation to the south of the existing pit in a more structurally complex part of the deposit. Drilling here intersected 42.25 m at 2.96% Zn, 0.59 g/t Au, 35 g/t Ag and 0.33% Pb from 25.75 m, including a massive sulfide zone of 3.1 m at 10.77% Zn, 3.34 g/t Au, 1.21% Pb and 133 g/t Ag. In early 2016, PNX announced maiden Indicated and Inferred Mineral Resources for Mount Bonnie of 1.29 Mt at 4.22% Zn, 1.3% Pb, 0.26% Cu, 1.26 g/t Au and 133 g/t Ag. The majority of the Mineral Resource is comprised of sulfide mineralisation and occurs from approximately 25 m to 150 m below surface directly beneath the historical oxide pit. A scoping study on the Iron Blow and Mount Bonnie projects is due for completion in March 2016.

Thundelarra Exploration Ltd undertook further drilling in 2015 at their ***Allamber*** project located north of Pine Creek, with seven RC holes drilled for 1188 m. The drilling focussed on the ***Ox-Eyed Herring*** prospect, following up encouraging results from 2014 that included 5 m at 4.23% Cu with associated gold, silver, tin and bismuth from 113 m. The best intersection from 2015 drilling was 6 m at 1.6% Cu and 20 g/t Ag from 182 m at the contact zone between granite and hornfelsed metasedimentary rock.

McArthur Basin

The ***McArthur River*** mine, situated about 70 km southwest of Borroloola in the McArthur Basin, is operated by McArthur River Mining Pty Ltd (MRM), a subsidiary of Glencore PLC. It opened as an underground mine in 1995 and has since been converted to open cut. At 31 December 2014, the McArthur River mine had total Reserves and Resources of 187.3 Mt at 9.8% Zn, 4.4% Pb and 43.7 g/t Ag including Ore Reserves of 103 Mt at 10% Zn, 4.7% Pb and 47 g/t Ag. During 2014 MRM produced 224 300 t Zn, 46 200 t Pb and 1.46 Moz Ag. The very fine-grained, thinly bedded sulfide ore is hosted in the HYC Pyritic Shale Member of the Barney Creek Formation.

One of the most significant new discoveries in the NT this decade has been the 2013 discovery of the ***Teena*** zinc deposit, 10 km west of the McArthur River mine, by a Teck Australia Pty Ltd-Rox Resources Ltd joint venture. The mineralisation is finely laminated sphalerite-galena mineralisation within the Barney Creek Formation. It is a similar sedimentary exhalative ('SEDEX') style of mineralisation to the nearby McArthur River deposit. The mineralisation has a higher ratio of zinc to silver and lead than McArthur River. The highest grade mineralisation seems to occur in the keel of an east-trending syncline – interpreted as the deepest part of the depositional basin. There are two mineralised lenses; the upper lens (Lens 2) is generally thicker and higher grade than Lens 1. Four holes were drilled at Teena in 2015 for a total of 4949 m. The first hole drilled in 2015, TNDD019, was sited 200 m east of the discovery hole and intersected the thickest zone of mineralisation yet encountered at Teena, with 38.8 m at 14.7% Zn and 2.3% Pb from 1069 m, including 20 m at 19.4% Zn and 3.1% Pb from 1076 m. Other significant results included 21.2 m at 16.0% Zn and 2.6% Pb from 831 m in TNDD020 and 15.1 m at 14.23% Zn and 2.13% Pb from 855 m in TNDD022. The strike length of the high-grade mineralisation (greater than 13% Zn+Pb) at Teena has been defined over 1.3 km, with excellent continuity of the mineralisation indicated between drill holes. Based on the results in 2015, Rox announced a revised Exploration Target at Teena of 70–80 Mt at 11–13% Zn+Pb (10–12% Zn, 1–2% Pb) for 7.7–10.1 Mt of contained Zn + Pb.

Pacifico Minerals drilled four holes at their ***Coppermine Creek*** prospect, 100 km northwest of McArthur River, as part of their Borroloola West JV with Sandfire Resources.

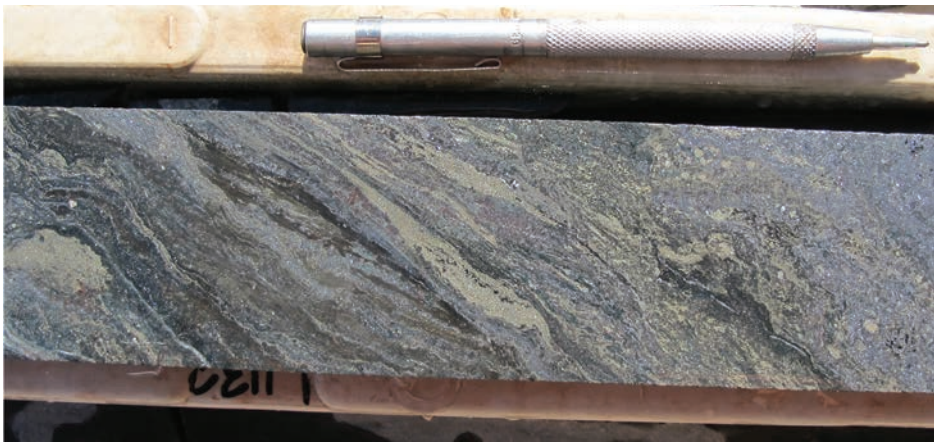

Figure 6. Semi-massive sulfide zone in drill core from Curiosity prospect, Rover field, containing pyrite, galena, chalcopyrite and sphalerite mineralisation.

The first three holes intersected copper mineralisation within fractured and brecciated Amelia Dolostone of the McArthur Group, with a best result of 10 m at 1.3% Cu from 68 m, including 2 m at 4.0% Cu; the highest grade mineralisation is associated with semi-massive chalcopyrite as well as chalcopyrite facture-fill and disseminations.

MMG Exploration Pty Ltd (MMG) continued to actively explore in the Batten Fault Zone area in the McArthur Basin under their North Batten JV with Sandfire Resources, as well as on their own tenure. As part of the North Batten JV, MMG drilled core holes at the ***Rosie Creek*** and ***Sawtooth*** prospects in 2015. Results at Rosie Creek confirmed the presence of prospective stratigraphy and structure at the prospect, with elevated geochemistry indicative of hydrothermal activity. MMG also undertook an audio-magnetotelluric (AMT) survey within the northern tenements hosting the Rosie Creek prospect to delineate the basin architecture.

TNG Ltd announced numerous rock chip samples of up to 48% Cu and 68 g/t Ag at their ***McArthur River project***, 60 km southwest of the McArthur River mine. The supergene-enriched high-grade malachite and chalcocite mineralisation with a Cu-Bi-Ag-Au-Mo metal association is hosted within a 10 m thick shale band in the lowermost Wollogorang Formation of the Tawallah Group. TNG announced that this sedimentary-hosted stratiform copper mineralisation had been outlined over an area in excess of 600 m by 400 m.

Redbank Copper Ltd announced the results of drilling conducted in late 2014 at the ***Redbank*** project in the McArthur Basin near the Queensland border. Copper mineralisation at Redbank is hosted in breccia pipes within the Tawallah Group (**Figure 7**). Total Indicated and Inferred Mineral Resources for the project area are 6.24 Mt at 1.5% Cu for 95 900 t of contained copper. Drilling at the *Bluff* prospect intersected 68 m at 1.21% Cu from 92 m, including 21 m at 2.24% Cu, and 9.5 m at 3.60% Cu from 164 m.

In 2014, Canadian-listed company GPM Metals Inc. formed a joint venture with Rio Tinto Exploration Pty Ltd to explore the ***Walker Gossan*** project in eastern Arnhem Land. The area is considered to have high potential for sediment-hosted base metal deposits of a similar style to McArthur River. In 2015, GPM acquired detailed airborne magnetics and conducted an IP geophysical survey, geological mapping and reconnaissance soil sampling of the primary area of historical interest at the southern portion on EL 24305. The company announced they had identified a 3 x 0.5 km corridor of anomalous lead, co-incident with an IP chargeability anomaly.

Diamonds

Merlin Diamonds Ltd's ***Merlin*** project in the McArthur Basin (**Figure 8**) comprises 14 kimberlite pipes of which nine were subject to open cut mining between 1998 and 2003 producing 507 000 ct of diamonds. The 2014 combined Probable Ore Reserve for all diamond pipes at Merlin is 2.02 Mt at 0.15 carats per tonne (ct/t) for a total of 0.61 Mct; this is a substantial reduction on the 2011 Ore Reserves. The Indicated and Inferred Mineral Resource is 27.8 Mt at 0.16 c/t for a total of 4.35 Mct. No exploration drilling results were reported during 2015.

Bauxite and alumina

Rio Tinto Ltd operates the ***Gove*** bauxite mine and alumina refinery in northeastern Arnhem land, which has been in production since 1971. Bauxite at Gove occurs in deeply lateritised, dissected plateau remnants overlying the Cretaceous Yirrkala Formation. At the end of 2012, the Gove operation had Proved Ore Reserves of 155 Mt at 49.5% Al_2O_3 and a Probable Ore Reserves of 13 Mt at 49.4% Al_2O_3, with additional Measured, Indicated and Inferred Mineral Resources of 47 Mt at 49.7% Al_2O_3. During 2014-15, the Gove operation produced 6.99 Mt of bauxite.

On the ***Dhupuma Plateau***, immediately south of the Gove mineral lease, Gulkula Mining Company Pty Ltd have applied for a mineral lease for a bauxite mining

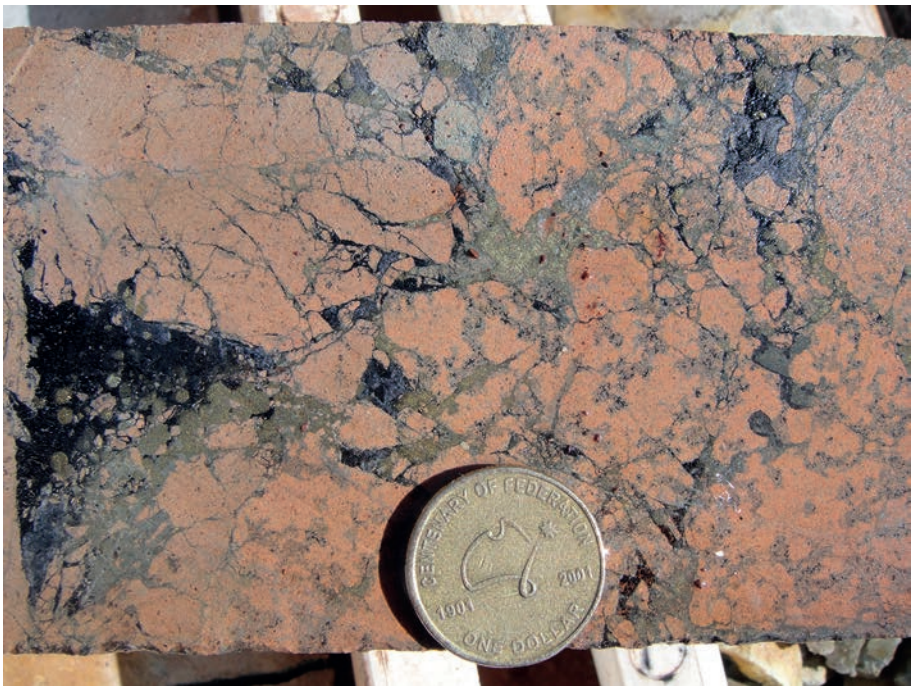

Figure 7. Mineralised breccia from Bluff prospect, Redbank copper field, McArthur Basin

operation associated with a Mining Training Centre for local Indigenous people with the support of Rio Tinto. Alcoa of Australia commenced exploration for bauxite on ***Howard Island*** and ***Elcho Island*** in eastern Arnhem Land, following the granting of tenements in late 2014.

Iron ore

All iron ore operations in the Northern Territory remained in care and maintenance during 2015 due to the low iron ore price; no significant iron ore exploration was reported.

Territory Resources Ltd, a subsidiary of Singapore-listed Noble Group, owns the ***Frances Creek*** iron ore mine, which has been in care and maintenance since late 2014. The iron mineralisation occurs in a fault breccia in the lower Wildman Siltstone and ranges in composition from hematite to goethite and limonite.

Iron mineralisation in the Roper iron field varies from massive to oolitic and pisolitic haematite, and occurs within interbedded medium- to very coarse-grained ferruginous sandstone and siltstone of the Mesoproterozoic Sherwin Ironstone Member of the Roper Group. The ***Roper Bar*** iron ore mine, which commenced production in late 2013, has been in care and maintenance since Western Desert Resources Ltd were placed in administration in September 2014. In July 2014, the total DSO (direct shipping ore) mineral resource at Roper Bar was 44.1 Mt at 58.5% Fe, 10.8% SiO_2, 2.00% Al_2O_3, 0.005% P and 2. 5% LOI. The ***Roper River*** project, 100 km west and northwest of the Roper Bar project, incorporates the ***Sherwin Creek*** and ***Hodgson Downs*** prospects and was owned by Sherwin Iron Ltd, now also in administration. The Roper River project has total Indicated and Inferred Mineral Resources of 488 Mt at 41.7% Fe. Higher-grade mineral resources (at 55% Fe cut-off) total 41.1 Mt at 57.8% Fe, 12.1% SiO_2, 1.8% Al_2O_3, 0.06% P and 2.6% LOI.

Manganese

Oolitic and pisolitic mineralisation in Mesozoic sedimentary rocks on ***Groote Eylandt*** in the Gulf of Carpentaria forms one of the world's highest-grade manganese deposits with 175 Mt at 44.8% Mn. The mineralisation is a stratiform, commonly oolitic or pisolitic, sedimentary deposit in shallow marine Cretaceous sedimentary rocks. It was discovered in 1960 and has been continuously mined by the Groote Eylandt Mining Company (GEMCO) since 1966. GEMCO is majority-owned and operated by South32 Ltd. Production from Groote Eylandt in 2014 totalled 4.837 Mt of manganese ore. A $US139 million premium concentrate project (PCO2) is currently underway and is expected to increase production capacity by 0.5 Mt to 5.3 Mtpa, with first production anticipated in the June 2016 quarter.

A second manganese mine in the NT occurs in Proterozoic rocks at ***Bootu Creek*** located 110 km north of Tennant Creek. OM Manganese Ltd began mining operations at Bootu Creek in November 2005. At 31 December 2014, total Reserves and Resources for Bootu Creek were 20.5 Mt at 22.24% Mn. During 2015 OM Manganese mined 1.92 Mt of ore at 22.52% Mn, resulting in full year manganese production of 760 870 t grading 35.71% Mn. In December 2015, OM announced that it was temporarily suspending mining operations at Bootu Creek due to the fall in manganese price, but would recommence operations when market conditions improve; however, in January 2016, OM Manganese entered voluntary administration.

Nickel

There was no significant nickel exploration reported in the Northern Territory during 2015. Independence Group NL and ABM Resources NL extended and expanded their Lake Mackay exploration agreement, which includes the ***Du Faur*** prospect located 30 km northeast of Kintore in the southwestern Aileron Province. Soil sampling in late 2014 at Du Faur identified a 7 km x 5 km nickel anomaly with up to 1300 ppm Ni in soils; a sample of laterite from the area assayed 1.6% Ni, 1.61% Co and 38.5% Mn. Outcrops in the area include norite and gabbronorite of the Andrew Young Igneous Complex.

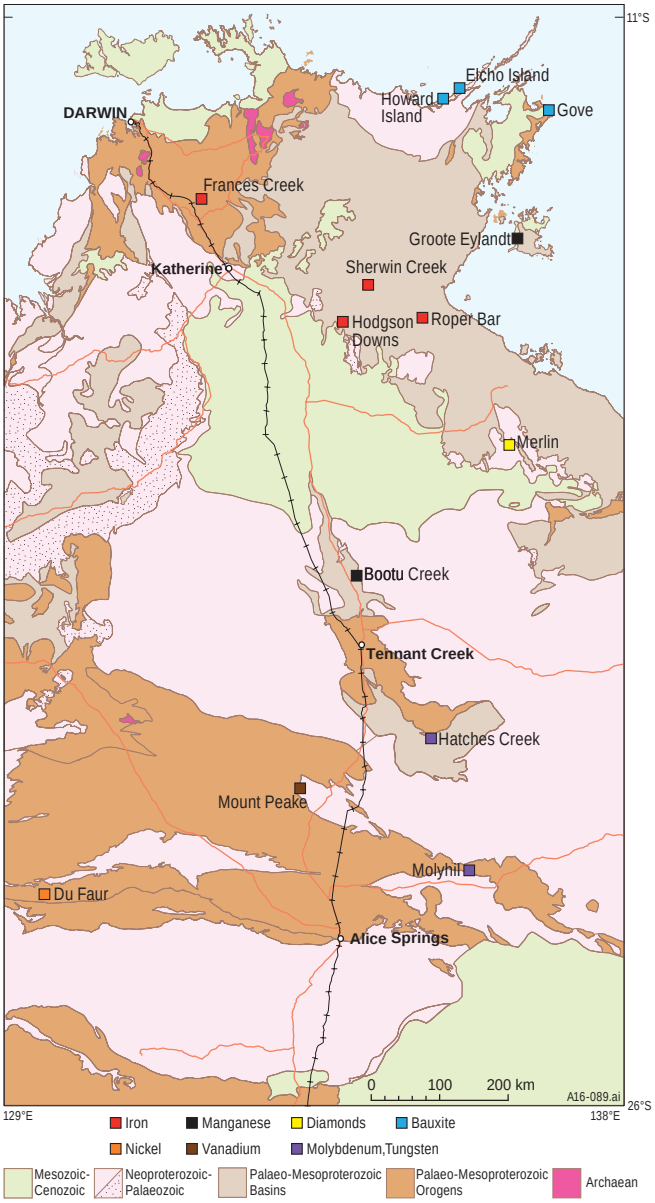

Figure 8. Location of diamond, iron ore, manganese, tungsten-molybdenum, nickel, and vanadium deposits and projects mentioned in the text.

Tungsten (-molybdenum)

Thor Mining PLC continued to pursue options for development of the ***Molyhil*** molybdenum-tungsten project located near the Plenty Highway northeast of Alice Springs. Molyhil is a skarn-related scheelite-molybdenite-magnetite deposit within the Arunta Region; it contains a Mineral Resource of 4.71 Mt at 0.28% WO_3, 0.22% MoS_2 and 18.1% Fe, most of which is in the Indicated category, with an open cut Probable Ore Reserve of 3.0 Mt at 0.31% WO_3 and 0.12% MoS_2. An updated feasibility study was released in January 2015, but no further exploration was reported during the year.

The historic ***Hatches Creek*** tungsten field in the Davenport Province contains numerous underground workings that were mined between 1915 and 1957 exploiting quartz veins containing wolframite with lesser scheelite, bismuth and copper oxides. Arunta Resources Ltd have announced an Inferred Resource of 225 066 t at 0.58% WO_3 for 1311 t WO_3 within surface stockpiles of historically mined ore. During 2015, Arunta Resources undertook metallurgical testwork on 12 bulk samples, and flew detailed 3D imagery over the field to more accurately calculate the volume of mine dumps.

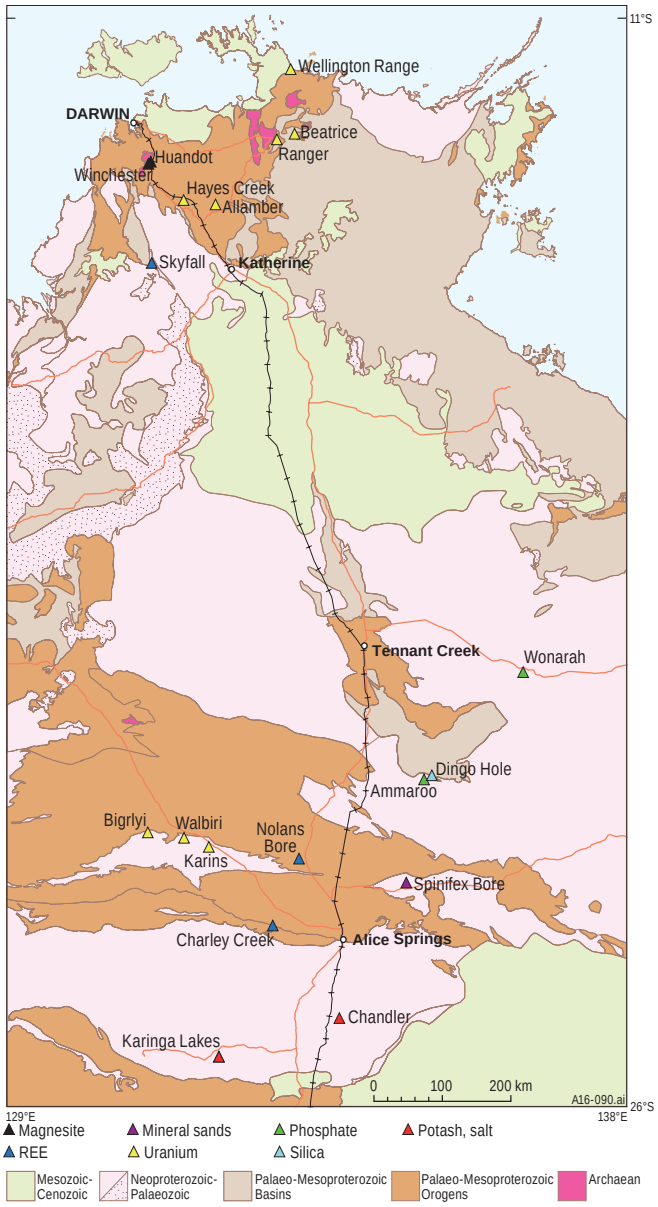

Figure 9. Location of magnesite, mineral sands, rare earths, phosphate, potash, salt and uranium deposits and projects mentioned in the text.

Vanadium-titanium-iron

TNG's ***Mount Peake*** project is a gabbro-hosted vanadium-titanium-iron deposit in the northern Arunta Region located 60 km west-southwest of Barrow Creek. It contains total Measured, Indicated and Inferred Mineral Resources of 160 Mt at 0.28% V_2O_5, 5.3% TiO_2 and 23.0% Fe. TNG completed a successful feasibility study on the Mount Peake Project in July 2015; this included the definition of a maiden Probable Ore Reserve of 41.1Mt (50% of mine life) at 0.42% V_2O_5, 7.99% TiO_2 and 28.0% Fe at a cut-off grade of 15% Fe. The feasibility study indicated robust economics based on an initial 17-year project life, with a mining operation of 3 Mtpa expanding to 6 Mtpa after 4 years of production. The company anticipates annual production of 17 560 tpa V_2O_5, 236 000 tpa TiO_2 (pigment) and 637 000 tpa Pig Iron. Drilling at Mount Peake in 2015 was limited to geotechnical and aquifer drilling.

Magnesite

A number of high-grade magnesite (magnesium carbonate) deposits occur near Batchelor in the Pine Creek Orogen as stratabound bodies within the Celia and Coomalie Dolostones. In January 2015, Korab Resources Ltd (Korab) released a prefeasibility study for the ***Winchester*** magnesite deposit near Batchelor (**Figure 9**). Mineralisation at Winchester is hosted within the Coomalie Dolostone and has Indicated and Inferred Mineral Resources of 16.6 Mt at 43.2% MgO. The prefeasibility study investigated a DSO operation producing up to 1 million tonnes at an 80% magnesite-fines ratio. Korab announced that they were seeking financing options for the project.

Thessally Resources Pty Ltd owns the ***Huandot*** magnesite deposit located 7 km northeast of the Winchester deposit; it has Indicated and Inferred Mineral Resources of 9.1 Mt at 44.3% MgO. Thessally is undertaking a prefeasibility study on development options for Huandot, including the potential production of caustic calcined magnesia.

Mineral sands

Australian Abrasive Minerals Pty Ltd are planning to commence mining the ***Spinifex Bore*** garnet sand deposit located north of the Harts Range 170 km northeast of Alice Springs in March 2016. No resource has been publicly announced for the deposit. The project will involve open cut strip mining with an onsite processing wet screening plant to produce concentrate and dry magnetic and electrostatic separation. The final product will be trucked to Alice Springs and transferred to the Adelaide-Darwin railway.

Rare earth elements

Arafura Resources Ltd (Arafura) are operators of the Nolans Bore rare earth elements (REE) project located in the

Reynolds Range, 135 km northwest of Alice Springs. Nolans Bore is a hydrothermal, stockwork vein-style REE deposit hosted in metasedimentary and igneous rocks of the Aileron Province of the Arunta Region. Apatite mineralisation at Nolans Bore ranges from discrete, narrow fine-grained veins to wide intervals of massive coarse-grained breccia. Updated Measured, Indicated and Inferred Mineral Resources at Nolans Bore announced in October 2015 totalled 56 Mt at 2.6% rare earth oxides (REO), 11% P_2O_5 and 0.02% U_3O_8 containing 1.46 Mt REO. The Probable Ore Reserve for Nolans Bore is estimated at 24 Mt at 2.8% REO, 12% P_2O_5, 0.02% U_3O_8. Exploration activity by Arafura in 2015 largely focussed on activities related to the definitive feasibility study, including groundwater studies, waste rock characterisation, identification of carbonate resources to support mining and re-calculation of the mineral resource.

During 2015, Spectrum Rare Earths Ltd (Spectrum) undertook mineralogical testwork and metallurgical and beneficiation studies on their ***Skyfall*** rare earths prospect located 140 km west of Katherine. The mineralised area at Skyfall occurs over an area of 6 x 1 km. It is a flatlying, surficial, mostly clay-hosted rare earths prospect, between 0.9 and 4.3 m in thickness, grading between 0.17% and 0.8% TREO of which 36-38% are Magnetic End Use Rare Earth Oxides (classified by Spectrum as Dy, Tb, Nd, Pr, Sm and Gd). The main rare earth minerals at Skyfall include secondary yttrium phosphate (xenotime-churchite) and aluminium phosphate/crandalite group minerals such as florencite. In December 2015, Spectrum reported that due to the complex mineralogy and metallurgy of the deposit, a depressed rare earth market and a lack of investor interest, it was relinquishing the tenements.

Crossland Strategic Metals Ltd undertook no exploration in 2015 on its ***Charley Creek*** alluvial rare earths project due to funding constraints. The resource is located 120 km west of Alice Springs and is contained within unconsolidated alluvial outwash, sourced largely from the Teapot Granite Complex in the Warumpi Province to the south. The deposit includes an Indicated Mineral Resource of 387 Mt at 295 ppm TREO and an Inferred Mineral Resource of 418 Mt at 289 ppm TREO, hosted in xenotime and monazite. In December 2015, Crossland announced that Malaysian-owned Essential Mining Resources Pty Ltd had concluded the purchase of 44% of the Charley Creek project from previous joint venture partner Pancontinental Uranium Corporation.

Phosphate

Avenira Ltd (formerly Minemakers Ltd) are operators of the ***Wonarah*** phosphate project, located close to the Barkly Highway approximately 260 km east of Tennant Creek. Wonarah occurs in the Cambrian upper Gum Ridge Formation or basal Wonarah Formation within the Georgina Basin. It has total Measured, Indicated and Inferred Mineral Resources (at 10% P_2O_5 cut-off) of 842 Mt at 18% P_2O_5, comprising 707 Mt in the Main Zone and 135 Mt in the Arruwurra deposit. No on-ground work was reported at Wonarah in 2015 as the company awaited the commercial validation of the Improved Hard Process (IHP) owned by JDC Phosphate Inc. Avenira hope to utilise IHP at Wonarah to produce superphosphoric acid at around 70% P_2O_5 with a by-product of usable inert spent pellets.

Rum Jungle Resources Ltd (Rum Jungle) continued to progress their ***Ammaroo*** phosphate project located in the southern Georgina Basin, approximately 80 km east of the Alice Springs–Darwin railway. In December 2014, Rum Jungle announced updated total Measured, Indicated and Inferred Mineral Resources of 1.145 Bt at 14% P_2O_5 (at 10% P_2O_5 cut-off) or 348 Mt at 18% P_2O_5 (at 15% cut-off). A prefeasibility study released in September 2014, and updated in September 2015, supported the economic potential of the project to be developed as a phosphate rock concentrate export operation or for downstream fertiliser production using proven technologies. No further exploration was reported at Ammaroo in 2015.

Potash

Rum Jungle Resources' ***Karinga Lakes*** potash project is located between Erldunda and Curtin Springs, 200–300 km southwest of Alice Springs. The Karinga Lakes drainage system contains hundreds of salt lakes representing the eastern extension of the Lake Amadeus system. Measured, Indicated and Inferred Mineral Resources at Karinga Lakes are 8.4 Mt K_2SO_4 with an average resource thickness of 17 m contained beneath 25 lakes with a total area of 132 km^2. The average potassium grade in the resource is 4760 mg/l (at 3000 mg/l cut-off). Two distinct aquifers are present with one contained in unconsolidated near-surface lake sediments with the second aquifer hosted in siltstone and sandy interbeds of the Devonian Horseshoe Bend Shale of the Finke Group (Amadeus Basin). In November 2015, Rum Jungle announced that they had commenced a 12 hole evaluation drilling program on a limited area within the project to test depth extensions of the aquifers and better understand the nature of the hydrogeology, brine chemistry at depth and recharge potential. Also in November, Rum Jungle appointed managers for a prefeasibility study on the project, which has the potential to be a small scale, low capital cost, sulphate of potash (SOP) operation targeting approximately 40 000 tpa.

Salt

Tellus Holdings Ltd (Tellus) continued to progress plans to develop an underground rock salt mine at their ***Chandler*** project near Titjikala located in the Amadeus Basin, 120 km south of Alice Springs. The project is focussed on a halite resource within a flat-lying, extensive evaporite unit (in excess of 200 m thick) within the Cambrian Chandler Formation. It contains a Measured Mineral Resource of 309 Mt NaCl, and Indicated and Inferred Mineral Resources of 1.128 Bt NaCl and 3.103 Bt NaCl respectively, with an overall average halite grade of 88.6%. There are individual layers of high-grade halite (~98%). The total thickness of the deposit varies between 220-261 m. Tellus have commenced a definitive feasibility study on the project, and work in 2015 included wet and dry salt processing pilot testing and drilling for groundwater resources.

Silica

During 2015, Rum Jungle Resources Ltd undertook characterisation and process testing on their ***Dingo Hole*** silica project, targeting high-purity silica quartz rock. The project is located on the southern margin of the Davenport Province, 10 km from the Ammaroo phosphate project. The silica has been reported to occur as pedogenic, chalcedonic silica rock. Testing of samples from the prospect found that all samples had in excess of 99.94% SiO2, with relatively low levels of impurities such as aluminium, titanium and lithium. Follow up processing test work on 100 kg of quartz rock found higher levels of impurities, particularly calcium, that did not meet the standards for high-purity quartz (HPQ). Rum Jungle reported that they will continue to investigate the silica potential of the area.

Uranium

The ***Ranger*** uranium deposit is hosted in the lower Cahill Formation in the Pine Creek Orogen close to the structural contact with the underlying Archaean Nanambu Complex; it has been in production since 1981. During 2015, Energy Resources of Australia Ltd (ERA) produced 2005 t of uranium oxide from the Ranger mine, a 72% increase from 2014 production. All production was from stockpiles from the Ranger 3 open pit, which is now backfilled and being used as tailings facility. At the end of 2015, Ore Reserves at Ranger (entirely within stockpiles from Ranger 3 pit) are 12.08 Mt at 0.086% U_3O_8 for 10 383 t U_3O_8 (at 0.06% U_3O_8 cut-off); additional Mineral Resources (in stockpiles and in Ranger 3 Deeps) are 50.75 Mt at 0.11% U_3O_8 for 56 149 t U_3O_8. The 2710 m Ranger 3 Deeps exploration decline was completed in late 2014. In July 2015, ERA announced updated Measured, Indicated and Inferred Mineral Resources for Ranger 3 Deeps totalling 19.575 Mt at 0.224% U_3O_8 for an estimated contained 43 858 t U_3O_8. In June 2015, following a prefeasibility study, ERA announced that the Ranger 3 Deeps project would not proceed to final feasibility study in the current operating environment.

Western Arnhem Land continued to be an important focus for uranium exploration in the NT in 2015. Cameco Australia Pty Ltd (Cameco) have continued a significant exploration program in their ***Wellington Range*** project area located near the north coast of western Arnhem Land. No exploration results have been publicly released from their 2015 program, although NTGS co-funded drilling under the *CORE* initiative at a number of greenfields prospects with results due to be open filed in the first half of 2016.

Alligator Energy Ltd (Alligator) undertook an 87 hole, 2257 m air core drilling program at their ***Beatrice*** project in western Arnhem Land as part of a farm-in and joint venture with Cameco Australia. The drilling was undertaken at the BT-4, Beatrice and BT-1 target areas, as well as reconnaissance drilling at the BT-9 target. At the BT-1 prospect, anomalous uranium was encountered extending for more than 2 km along the Beautrice Fault Zone. Alligator consider that the primary source of the anomaly is under the covering sandstone immediately north of BT-1, which remains undrilled. At Beatrice, the drilling tested southerly extensions of known high-grade surface mineralisation, and encountered mineralisation with a best intercept of 2 m at 598 ppm U_3O_8.

Energy Metals Ltd (Energy Metals) have continued evaluating the ***Bigrlyi*** uranium deposit in the Mount Eclipse Sandstone of the northern Ngalia Basin. The 2011 resource for Bigrlyi contains total Indicated and Inferred Mineral Resources of 7.5 Mt at 0.13% U_3O_8 and 0.12% V_2O_5 at a 500 ppm U cut-off, for a contained 9600 t (21.1 Mlb) of U_3O_8 and 8900 t of V_2O_5. During 2015, Energy Metals released maiden JORC resources for other deposits in the Ngalia Basin on the basis of historic drilling. At ***Walbiri***, 55 km east-southeast of Bigrlyi, Energy Metals announced an Inferred Resource of 12.48 Mt at 597 ppm U_3O_8, for 7456 t U_3O_8. This includes small resources at two satellite deposits, Hill One and Sundberg. Walbiri is a tabular, sandstone-hosted deposit similar to Bigrlyi, dipping at 10–18° southwest, with uraninite and coffinite mineralisation hosted in reduced, pyrite-bearing rocks. This is now the third largest uranium resource in central Australia after the Bigrlyi and Angela deposits. At the ***Karins*** prospect, 95 km east-southeast of Bigrlyi, Energy Metals defined an Inferred Resource of 1.24 Mt at 556 ppm U_3O_8. Karins is a tabular deposit similar to Bigrlyi, but with an oxidised zone (carnotite zone) of variable thickness that extends from near surface to up to 60 m depth. Primary mineralisation is present as uraninite, and is hosted within reduced, feldspathic, fine-grained sandstones of the Mount Eclipse Sandstone.

Onshore petroleum

Despite the downturn in oil and gas prices, exploration activity continued in the onshore basins of the Northern Territory, particularly the Beetaloo Sub-basin, with six new wells drilled for a total of 12 259 m. **Figure 10** shows petroleum tenure and basins with the locations of wells drilled in 2015 in the NT.

McArthur Basin

The Beetaloo Sub-basin is a significant depocentre of Mesoproterozoic Roper group sedimentary rocks that underlies the Mesozoic Carpentaria Basin in the vicinity of Dunmarra and Daly Waters. The sub-basin is the NT's most advanced shale gas and shale oil play.

Origin Energy Ltd drilled their first wells in the Beetaloo Sub-basin as part of their farm-in with Sasol Petroleum Australia Limited into Falcon Oil & Gas Australia Ltd's tenements. The first well, *Kalala S-1*, was drilled to 2619 m and intersected a thick succession of source rock shale of the middle Velkerri Formation within a prospective gas mature depth window. The well intersected a gross interval of over 500 m shale gas with net pay exceeding 150 m and the presence of moveable hydrocarbons in the form of elevated gas shows. A second well, *Amungee NW-1*, 25 km east of Kalala S-1, was drilled to 2611 m and intersected a similar succession of gas-bearing middle Velkerri shale. Amungee NW-1 also intersected a gross interval of over 500 m shale gas sequence with net pay exceeding 150 m, with excellent

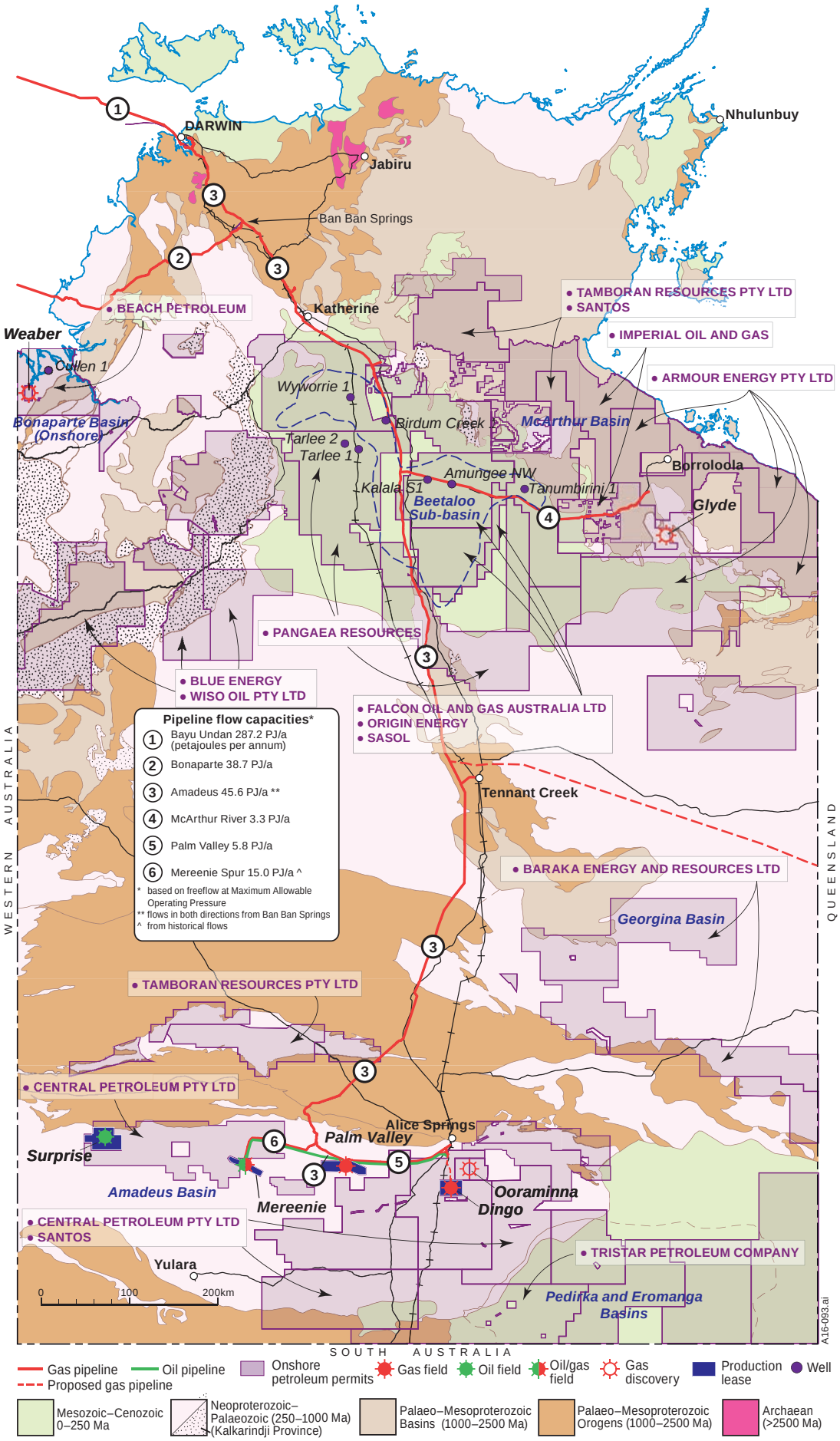

Figure 10. Map of Geological Regions of the Northern Territory showing granted exploration permits as of January 2016, along with wells and prospects mentioned in the text.

gas shows from at least two prospective shale sweet spots within the middle Velkerri Formation. Total organic carbon estimates were in the range 2.5-5% within the best shale units from these wells, with high potential for gas mature, gas saturated and quartz rich source rocks. In late 2015, Origin drilled the first horizontal appraisal well in the Beetaloo Sub-basin at Amungee NW-1 after plugging back the vertical section of the well. Falcon announced that the joint venture had discovered a prospective and laterally extensive sweet spot with excellent gas shows that indicate the likelihood of high levels of gas saturation across the entire horizontal section of "B Shale" interval of the middle Velkerri Formation. Multi-stage hydraulic fracturing of the well is planned for 2016.

Pangaea Resources Pty Ltd (Pangaea) have a large tenement holding over the Gorrie Sub-basin, a poorly explored western extension of the Beetaloo Sub-basin located west of the Stuart Highway near Larrimah. After drilling three wells in 2014, Pangaea drilled four appraisal wells in EP167 and EP168 – *Birdum Creek-1* (1931.9 m), *Tarlee-1* (1335.5 m), *Tarlee-2* (1180 m) and *Wyworrie-1* (1385 m). Wyworrie-1 and Birdum Creek-1 were hydraulically fracture stimulated, tested and then suspended, Tarlee 2 was drilled and then decommissioned and Tarlee-1 was drilled, a Diagnostic Fracture Injection Test (DFIT) was conducted and then suspended. All four wells were targeting the middle Velkerri shale in the McArthur Basin. Pangaea also conducted a 386.11 km 2D seismic survey. Pangaea is a private company and results of the drilling have not been publicly released.

Santos Ltd (Santos) are farming into three exploration tenements owned by Tamboran Resources and located to the north and east of the Beetaloo Sub-basin, and including the OT Downs Sub-basin. In 2014, Santos drilled the *Tanumbirini-1* exploration well in EP161 to a depth of 3945 m and intersected multiple thick intervals of organic-rich rocks accompanied by significant mud gas shows within the middle Velkerri Formation. Elevated gas readings were encountered over a total gross interval in excess of 500 m. No further work was undertaken in 2015, but a DFIT on Tanumbirini-1 is planned for 2016.

Armour Energy Ltd (Armour) have a significant landholding in the southern McArthur Basin and northern Georgina Basin. Armour commenced exploration in the Batten Fault Zone in the McArthur Basin near Borroloola in 2012. They are targeting conventional resources, including fractured plays in the Coxco Dolostone Member of the Teena Dolostone, as well as larger unconventional resources within the Barney Creek Formation, Lynott Formation and Reward Dolostone. No exploration was reported in 2015, and the company was negotiating a farm-out agreement with AEGP Australia Pty Ltd (AEGP), a subsidiary company of Oklahoma-based American Energy Partners.

In December 2015, Imperial Oil and Gas Pty Ltd finalised a farm-out agreement with AEGP, for Imperial's tenement package in the McArthur Basin, including applications in eastern Arnhem Land. No on-ground exploration was reported on Imperial's tenements in 2015.

Amadeus Basin

All onshore oil and gas production in the NT is currently sourced from the Amadeus Basin, with a total of 3.703 billion standard cubic feet (bscf) of gas and 0.302 million barrels (mmbbls) of oil produced in 2015. The ***Mereenie*** oil and gas field is located 245 km west of Alice Springs and has been in production since 1984. Oil and gas at Mereenie is reservoired within multiple, thin sandstone beds within the Pacoota Sandstone and, to a lesser extent, the Stairway Sandstone, which are separated by source rock of the Horn Valley Siltstone. In 2015, Mereenie produced 0.278 million barrels (mmbbls) of oil and 2.395 bscf of gas. In September 2015, Central Petroleum Ltd acquired a 50% stake in the Mereenie field from Santos and assumed operatorship of the field. In 2015, the company conducted a 3-well testing campaign at Mereenie to obtain data as part of studies to increase gas reserves and resources base

The ***Surprise*** oil field occurs in the western Amadeus Basin, 140 km west of Mereenie and is operated by Central Petroleum. The Surprise field commenced production in 2014 and produced a total of 0.080 mmbbl (including 0.024 mmbbl in 2015) before it was shut-in in August 2015 due to the decline in the oil price. The main reservoir at Surprise is the Stairway Sandstone.

Central Petroleum also operates the ***Palm Valley*** and ***Dingo*** dry gas fields. Gas at the Palm Valley field, 150 km west of Alice Springs, occurs within naturally fractured Pacoota and Stairway sandstones, and has been in production since 1983. In 2015, 1.282 bscf of gas was produced from Palm Valley. In mid-2015 Central announced that Palm Valley has 2P Reserves of 23.6 Petajoules (PJ) and 2C Contingent Resources of 29.7 PJ. The ***Dingo*** gas field, 60 km south of Alice Springs came into production in December 2015, and produced 0.026 bscf by the end of the year. The main gas reservoir at Dingo is the Neoproterozoic to early Cambrian Arumbera Sandstone. A 50 km gas pipeline from Dingo to the Brewer Estate in Alice Springs was commissioned in 2015. Dingo has 2P Reserves of 33.2 PJ and 2C Contingent Resources of 22.7 PJ.

Central Petroleum also has a farm-in agreement worth up to $150 million with Santos for a large area in the Amadeus Basin. Santos has assumed operatorship of the tenements, and drilled the Mount Kitty well in 2014. No exploration was reported in 2015, but a 2D seismic survey is planned for 2016.

Bonaparte Basin

During 2015, Beach Energy Ltd (Beach) assumed 100% ownership of EP161 in the onshore Bonaparte basin through the acquisition of Territory Oil and Gas Pty Ltd (TOAG). The company continued assessment of the *Cullen-1* well, which was drilled in 2014 to a depth of 3325 m with the primary targets being the Bonaparte Formation and Milligans Formation. The well intersected 1000 m of limestone and interbedded shale with evidence of natural fractures and elevated mud gas readings. In addition, 1600 m of dark grey to black marine shale were intersected with two cores cut for evaluation purposes including gas desorption analyses. In 2015, Beach re-entered the well to conduct a Cement Bond Log.