

# Contents

---

## **Overview papers**

---

Known, absent and potential mineral deposit types in Australia <i>D I Groves, R R Large and G N Phillips</i>	1
Key trends in Australian mineral resources and production <i>G M Mudd and S M Jowitt</i>	7
Geology of Australia <i>R J Korsch</i>	13
Geophysics of Australian orebodies <i>R J Smith, K M Frankcombe, W S Peters and M C Dentith</i>	21
Geology of the Australian regolith <i>C R M Butt, R R Anand and R E Smith</i>	27
Australian resources – innovations in exploration, characterisation and geology <i>J Law</i>	35
Managing data for mineral exploration <i>A Riganti and J R Vearncombe</i>	41
Mineral discovery and development in Australia <i>E Eshuys</i>	43
Use, misuse and change of geological terms – a guide for mineral industry geologists <i>S P Carey and M J Hughes</i>	47
Reporting of Resources and Reserves – the JORC Code <i>P Stoker</i>	51

## **Commodity overviews**

---

Western Australia nickel overview <i>S J Barnes, D R Mole and M A Wells</i>	53
Iron ore systems in Western Australia <i>S G Hagemann, T Angerer and P Duuring</i>	59
Critical metals in Australia <i>S M Jowitt and G M Mudd</i>	63
Australian rare element granitic pegmatites <i>P J Pollard</i>	67
Gold in Australia <i>G N Phillips</i>	75
Heavy mineral sand deposits of Australia <i>C A Standing, B Hou, M G Teakle, D Klingner and S Harrison</i>	83

## **Yilgarn Craton**

---

Yilgarn Craton geology <i>N L Wyche and S Wyche</i>	89
Yilgarn Craton – mineral deposits and metallogeny <i>J R Vearncombe and M Elias</i>	95
Long–Victor nickel sulfide deposits, Kambalda <i>S Staude, S Sheppard, P Parker and J Paggi</i>	107
Deacon nickel sulfide deposit, Tramways Dome, Kambalda <i>J D Hicks and R G Parkinson</i>	113
Widgiemooltha nickel deposits <i>R A Hatfield, P Muccilli and M Muller</i>	117
Black Swan nickel sulfide deposits <i>S J Barnes, N Hutchison and S Warriner</i>	123
Nickel deposits of the Mt Keith and Leinster regions, Agnew–Wiluna Belt <i>C S Perring, M T Rieuwers, E E Western, M M Menicheli, W F Greenwood and M J Gole</i>	127
Cosmos nickel sulfide deposit <i>T Thordarson and A de Joux</i>	133
Nova–Bollinger Ni–Cu–Co sulfide deposit <i>P Parker, J Bartlett, K Hodges, A Thompson and J G Standing</i>	139
Fisher East nickel-sulfide deposits <i>W Belbin, I Mulholland, L Burley, D R Mole and S J Barnes</i>	143
Rosie and C2 Ni–Cu–PGE deposits, Duketon <i>P Parker, J Day and J Paggi</i>	145
Murrin Murrin and Bulong smectite-hosted nickel laterite deposits <i>M A Wells and C R M Butt</i>	149
Greenbushes tin, tantalum and lithium deposit <i>G A Partington</i>	153
Mount Mulgine tungsten deposit <i>J R Vearncombe, S Bright and G Conner</i>	159
Mount Marion lithium pegmatite deposit <i>B Smith and J Ross</i>	161
Mount Weld and Gifford Creek rare earth elements carbonatites <i>F Pirajno, I González-Álvarez, A Border and T M Porter</i>	163
Teutonic Bore – Jaguar – Bentley volcanogenic massive sulfide field <i>P Parker, S Belford, R Maier, S Lynn and W Stewart</i>	167
Golden Grove Zn–Cu–Au deposits <i>C Gellie, S Neal and N Hughes</i>	173
Iron ore deposits of the Yilgarn Craton <i>P Duuring, T Angerer and S G Hagemann</i>	181
Kalgoorlie goldfield – petrology, alteration and mineralisation of the Golden Mile Dolerite <i>G N Phillips, J Hergt and R Powell</i>	185
Mount Charlotte deposit, Kalgoorlie goldfield <i>A G Mueller</i>	195
Kundana goldfield <i>D P Cooke, T Ramsey, J M Miller and A B Bath</i>	199

Coolgardie goldfield <i>M D Goodz and L A Money</i>	207
Bullabulling goldfield <i>G A Partington, T P Davis and T W B Pilcher</i>	211
Kambalda – St Ives goldfield <i>S K Oxenburgh, M Falconer, D Doutch, P Edmonds, A Foley and M Jane</i>	215
Mount Monger goldfield including Daisy Milano and Randalls <i>M D Goodz, L Cohalan, G Thynne, E Summerhayes, J Benton, C McGahren and M Jones</i>	223
Kanowna Belle gold deposit <i>A Bull, J Rogers, A Ross and G Tripp</i>	229
Gold deposits of the Leonora district <i>S A Jones and W K Witt</i>	235
Red October gold deposit <i>W K Witt and T Laneyrie</i>	243
Carosue Dam gold deposits <i>W K Witt and D Mills</i>	245
Sunrise Dam gold deposit <i>M Nugus, N H S Oliver, T G Blenkinsop, E J Hill, S Finlayson and J S Cleverley</i>	249
Gold deposits of the Granny Smith – Wallaby district <i>R B Tully, H K Platt, A R Chirnside and A L Murray</i>	255
Moolart Well, Garden Well and Rosemont gold deposits <i>J Balkau, T French and T Ridges</i>	261
Gruyere gold deposit, Yamarna <i>J P Osborne, J Levett, J Donaldson, R Berg, C Davys, K Prentice, D Tullberg, L Z Lubieniecki, J A Tunjic, A B Bath and J W Libby</i>	267
Jundee gold deposit <i>S Smith, R Haese and M W Grigson</i>	273
Sandstone goldfield <i>R S Davies, D Ryan, D I Groves, A Trench, J P Sykes, J G Standing, C Jia and W Robertson</i>	279
Andy Well gold deposit, Meekatharra <i>T Wellman, M Cossom, R Hingston and S Stephens</i>	283
Boddington–Wandoor gold-copper deposit <i>T M Porter</i>	287
Yilgarn gold deposits in higher metamorphic grade domains <i>R Powell and G N Phillips</i>	291
Tropicana gold deposit <i>M G Doyle, B Catto, D Gibbs, M Kent and J Savage</i>	299
Plutonic goldfield <i>M F Gazley, G Duclaux, M A Pearce, L A Fisher, E du Plessis, S Murray and R M Hough</i>	307
Big Bell gold deposit and its precursors <i>G N Phillips, R Powell and C D de Nooy</i>	313
Glenburgh goldfield <i>L K Roche, S P Johnson, M Dunbar and J Goldsworthy</i>	317
Carbonate-related uranium deposits of the north-east Yilgarn <i>G J Shirtliff, S Kneer and R A Cox</i>	321

## Pilbara Craton

---

Pilbara Craton geology and metallogeny <i>D L Huston, N L Wyche, A Hickman and M Norman</i>	325
Munni Munni platinum group element mineralisation, west Pilbara Craton <i>D M Hoatson</i>	331
Pilgangoora lithium-tantalum pegmatite deposit <i>M T Sweetapple, J Holmes, J Young, M W Grigson, L Barnes and S Till</i>	339
Spinifex Ridge molybdenum-copper deposit <i>B Cummins and B Cairns</i>	343
Banded iron formation-hosted iron ore deposits of the Pilbara Craton <i>P Duuring, Y Teitler and S G Hagemann</i>	345
Chichester and Solomon bedded and channel iron deposits <i>J M F Clout, C Counsell and C Simpson</i>	351
Nyidinghu and Eliwana – Flying Fish bedded iron deposits <i>D Kepert, S Robinson, N Clarke and N Nitschke</i>	359
Mt Tom Price, Paraburdoo and western Hamersley iron ore deposits <i>W Thorne, H Dalstra, J Gordon, M Paine and S G Hagemann</i>	363
BIF-hosted high-grade iron ore deposits in the eastern Hamersley Province <i>T Angerer, S G Hagemann, D Lascelles and H Reichardt</i>	369
Channel iron deposits of the Pilbara <i>E Ramanaidou, M A Wells, R Morris, G Duclaux, N Evans and M Danišík</i>	375
Woodie Woodie manganese deposits <i>S A Jones</i>	381

## Proterozoic – west

---

Regional geology and metallogeny of the Albany–Fraser Orogen <i>C V Spaggiari, C L Kirkland and R H Smithies</i>	385
Geology and metallogeny of the Capricorn Orogen <i>S P Johnson, H N Cutten, F J Korhonen and N L Wyche</i>	389
DeGrussa copper-gold deposit <i>P Hilliard, K E Adamczyk and M L Hawke</i>	393
Paroo Station (Magellan–Cano) supergene lead deposits, Capricorn Orogen <i>F Pirajno, N Sergeev, R Burlow and S Tessalina</i>	401
Yangibana rare earth elements deposit <i>A Border, K Whittle and S Coxhell</i>	403
Paulsens gold deposit <i>I O H Fielding, S P Johnson, J R Rogers and L K Elliott</i>	405
Paterson Orogen geology and metallogeny <i>D W Maidment, D L Huston and T Beardsmore</i>	411
Telfer gold-copper deposit <i>T M Porter</i>	417
Nifty and Maroochydore copper deposits <i>T M Porter</i>	423

Kintyre uranium deposit <i>P Sinclair, D Ewington and D Thomas</i>	427
Geology and metallogeny of the Kimberley Province <i>S Occhipinti, M Lindsay, I Tyler and A Aitken</i>	429
Savannah nickel sulfide deposits <i>JD Hicks, SJ Barnes, M Le Vaillant and DR Mole</i>	435
Zn-Pb-Ag deposits of the Lennard Shelf, Canning Basin <i>N A Reynolds and I A Copp</i>	441
Admiral Bay Zn-Pb-Ag deposit of the Canning Basin <i>N A Reynolds and I A Copp</i>	445
Manyingee uranium deposit <i>A Wilde, J-C Corbin and J Thom</i>	449

### **Proterozoic – north**

---

Pine Creek Orogen geology and metallogeny <i>JA Whelan, DF Close and IR Scrimgeour</i>	451
Alligator Rivers uranium province <i>A LL Browne</i>	457
Ranger 3 Deep uranium deposit <i>S Pevely, M Hinman and A McLellan</i>	461
Browns Cu-Pb-Zn-Co-Ni deposit <i>G F Johansen and A Johnston</i>	465
Pine Creek gold province including Cosmo and Maud Creek <i>M J Edwards and S P Hitchman</i>	467
Mount Isa Cu-Pb-Zn deposit including George Fisher deposit <i>R Lilly, D Taylor and N Spanswick</i>	473
McArthur River Zn-Pb-Ag deposit <i>T M Porter</i>	479
Teena zinc-lead deposit <i>M I Taylor, N E McMillan, I J Dalrymple and N Hayward</i>	483
Century Zn-Pb-Ag deposits <i>A J O'Rourke, B N B Johnson and S King</i>	485
Dugald River Zn-Pb-Ag deposit <i>J Broome and D Corley</i>	493
Mount Watson copper deposit <i>B Godsmark, B Dennis, L Cole, S Ryan and D Webb</i>	497
Valhalla uranium deposit <i>A Wilde and W L Andrews</i>	499
Ernest Henry iron oxide copper-gold deposit <i>R Lilly, G Case and B Miller</i>	501
Cannington Ag-Pb-Zn deposit <i>K Wright, B James and E Pucko</i>	507
Selwyn mineral field <i>M A McGeough and I L Faulkner</i>	513

Merlin molybdenum-rhenium deposit <i>I L Faulkner and K G Phillips</i>	519
Mineral deposits in the Einasleigh district <i>T Lees and P Buckle</i>	523
Argyle (AK1) diamond deposit <i>G L Boxer, A L Jaques and M J Rayner</i>	527
Merlin diamond deposit <i>T H Reddcliffe and M S Kammermann</i>	533
Georgina Basin phosphate deposits <i>J N Dunster and T J Munson</i>	535

### **Proterozoic – centre**

---

Tennant Creek copper-gold deposits including Gecko, Goanna and Rover <i>A L G Cuson, G A Osborne, R T Bills, S C Russell, N Donnellan, R Burke and C G Drown</i>	539
Groote Eylandt and Bootu Creek manganese deposits <i>J D Harvey, C T Reddell and E P W Swindell</i>	543
Gold deposits of the Tanami gold province <i>A S Wygralak, D L Huston and T P Mernagh</i>	547
Dead Bullock Soak including Callie <i>W J Pendegast, M S Baggott and S Schmeider</i>	551
Jervois Cu-Ag-Pb-Zn-Au mineral field <i>M R Bennett, M V McGloin, S Schmid and P Schaub</i>	557
Nolans Bore REE-P-U deposit <i>K J Hussey and J Goulevitch</i>	561
Molyhil tungsten-molybdenum deposit <i>M V McGloin and R S Brady</i>	565
Amadeus and Ngalia Basins – geology and metallogeny <i>C J Edgoose</i>	567
Bigrlyi uranium-vanadium deposit <i>W R Taylor and S Schmid</i>	571
Chandler salt deposit <i>J Livesey</i>	575
Musgrave Province regional geology and metallogeny <i>H M Howard, R A Dutch, D F Close and N L Wyche</i>	577
Nebo–Babel and Succoth Ni-Cu – platinum group element deposits, west Musgrave Province <i>Z Seat, B A Grguric, J M A Hronsky and G J Miles</i>	581

### **Gawler and Curnamona Cratons**

---

Geology and metallogeny of the Gawler Craton <i>A J Reid</i>	589
Granulite-hosted Challenger gold deposit <i>A G Tomkins</i>	595
Olympic Dam iron oxide Cu-U-Au-Ag deposit <i>K Ehrig, V S Kamenetsky, J McPhie, N J Cook and C L Ciobanu</i>	601

Prominent Hill copper-gold deposit <i>P Williams, H Freeman, I Anderson and R Holcombe</i>	611
Carrapateena iron oxide Cu-Au-Ag-U deposit <i>M Sawyer, B Whittaker and J de Little</i>	615
Graphite deposits of the Eyre Peninsula <i>JL Keeling</i>	621
Iron ore deposits of the Hutchison Group, Eyre Peninsula <i>D E Cronin</i>	625
Menninnie Dam Pb-Zn-Ag and Paris Ag-Pb deposits <i>B E Nicolson, J A Anderson and K C Cross</i>	629
Hillside iron oxide copper-gold deposit <i>G S Teale, P Say, N Green, H Forgan, C Went, M Twining and L Cole</i>	631
Curnamona Province – geological history and mineral systems <i>J A Fitzherbert and P M Downes</i>	635
Broken Hill Pb-Zn-Ag deposit <i>I Groves and I Plimer</i>	641
Copper-gold deposits of the Benagerie Ridge, Curnamona Province <i>C Giles and T Just</i>	647
Razorback magnetite deposit <i>G L England and T Thomas</i>	651
Honeymoon, Beverley and Four Mile uranium deposits <i>M Z Abzalov, P K Williams and N A Inwood</i>	655

### **Delamerian Orogen**

---

Adelaide Geosyncline, Stuart Shelf, Kanmantoo Trough and Delamerian Orogen <i>WM Cowley</i>	659
Angas Zn-Pb-Ag-Au deposit <i>T M Porter</i>	665
Kanmantoo copper deposits <i>P Rolley and M Wright</i>	667
Sedimentary magnesite deposits, Flinders Ranges <i>C M Horn, JL Keeling and J G Olliver</i>	671
Beltana non-sulfide zinc deposit <i>I Groves and C Carman</i>	673

### **Tasmanides of north-east Australia**

---

Northcote and Tregoora gold-antimony deposits in the Hodgkinson Province <i>V A Lisitsin and T Jackson</i>	677
Sn-W-Mo mineralisation in north-east Queensland <i>Z Chang, G Clarke, Y Cheng, J Poblete and K Liu</i>	681
Polymetallic massive sulfide deposits of the Mount Windsor Subprovince <i>S D Beams, T Bates, D L Huston and I J Morrison</i>	689
Ben Lomond uranium deposit <i>W L Andrews and S Parker</i>	693

Mount Leyshon gold deposit <i>P J Wormald</i>	697
Ravenswood and Mount Wright gold deposits <i>N Lisowiec and G Morrison</i>	705
Mount Carlton gold deposit <i>J Dugdale and N Howard</i>	711
Pajingo gold deposit <i>D J Osborne and C D Chambers</i>	717
Cracow gold deposit <i>S Pike, B Spence, C Wilson and E Little</i>	721
Mount Rawdon gold deposit <i>E Howard</i>	723
Twin Hills and Mount Gunyan silver deposits <i>D P Halloran, P M Ashley and J C Cooke</i>	725
<b>Lachlan Orogen</b>	
Mineralisation of the Lachlan Orogen <i>M J Hughes</i>	729
Cobar district mineral field <i>R E Brown, J Coffey, J Hosken, C Johnston and M Lenard</i>	739
Cobar copper-gold field <i>L Stander and R Berthelsen</i>	747
Girilambone copper district <i>P M Downes, C Raymond and J A Fitzherbert</i>	751
Cadia gold-copper deposits <i>T M Porter</i>	755
McPhillamys gold deposit <i>T French, P Duerden, H Simmons and P Flitcroft</i>	759
Northparkes copper-gold deposits <i>J Owens, D Priest, C Jago and A Pacey</i>	763
Temora copper-gold deposits <i>D E Cronin, J Kitto, B Mowat, S Munro and M M Scott</i>	771
Cowal gold deposits, Lake Cowal <i>P R Balind, J Booth and P McInnes</i>	775
Toongi rare metal deposit <i>D I Chalmers, T W Ransted and D G Meates</i>	779
Woodlawn Zn-Cu-Pb-Ag deposit <i>P M Downes, S A Jones, D A von Perger and K Hine</i>	781
Tomingley gold deposits <i>D G Meates, T W Ransted and D I Chalmers</i>	785
Dargues Reef gold deposit <i>A Lorriagan and G Cozens</i>	787
Fosterville gold deposit <i>S P Hitchman, N J Phillips and O J Greenberger</i>	791

Costerfield antimony goldfield <i>CTM Davis, A L Westcott, TA Fromhold, R M Eagle, CJ Gniel, B W Cuffley and CJ Gregory</i>	797
Stawell gold deposits <i>TM Porter</i>	801
Recent gold mining and exploration in Victoria <i>D H Taylor, C E Willman, M J Hughes and R K Boucher</i>	807
Walhalla – Woods Point goldfield <i>J A C Anderson and S King</i>	811
Avebury nickel sulfide deposit <i>T Callaghan, M Sloan and B Mackay-Scollay</i>	813
Rosebery Cu-Pb-Zn-Ag-Au volcanogenic massive sulfide deposit <i>K Denwer, L Garrick and M Robertson</i>	817
Mount Lyell copper-gold silver deposits <i>K Denwer, L Brown and J Hooper</i>	823
Savage River magnetite deposits <i>A Webster, V Braniff and R Bottrell</i>	829
Mount Lindsay and the South Meredith tin-tungsten deposits <i>S R Owen, S C Joughin, A Radonjic and J R K Stein</i>	835
Zeehan tin deposits <i>T Callaghan, R K Hazeldene and G S Teale</i>	839
King Island scheelite deposits <i>T Callaghan</i>	843
Henty gold deposit <i>A Lorrigan, M Blake and G Purvis</i>	847
Tasmania gold deposit, Beaconsfield <i>P B Hills</i>	851

---

### **Additional deposits**

Weipa bauxite plateau, Cape York <i>A Clements, J Bower, M Mills and I Rees</i>	855
Other significant deposits <i>TM Porter</i>	857

---

### **Indexes**

Author index	865
Subject index	869