

Australian & New Zealand Gold Operations

June Quarter 2017 - Final Report

Overview

The average All-in Sustaining Cost (AISC) for Australia and New Zealand was A\$1,196/oz down 1.2% (A\$14/oz) on the previous quarter average AISC of A\$1,210/oz. Evolution Mining's part of the Ernest Henry operations was the lowest cost producer reporting an AISC of A\$-432/oz followed by Newcrest's Cadia Valley operations with an AISC of A\$404/oz, then by Kirkland Lake's Fosterville (A\$517/oz) and Regis Resources' Duketon North (A\$606/oz). The average spot price for the quarter was A\$1,675/oz (US\$1,257/oz). It should be noted that both Ernest Henry and Cadia Valley benefit from significant copper by-product credits in Evolution Mining's and Newcrest's calculation of AISC respectively, leading to a vastly lower AISC compared to other gold operations.

Newmont's Boddington operation kept top spot as Australia's largest gold producer with 212,000 oz for the quarter, followed by Barrick and Newmont's Kalgoorlie operations (188,000 oz) then Tropicana (110,509 oz) a joint Venture between AngloGold Ashanti Limited and Independence Group NL. Of the mines where gold is a by-product, OZ Minerals' Prominent Hill produced the most gold 32,136oz followed by BHP's Olympic Dam 28,188 oz and Evolution's Ernest Henry with 23,756 oz. The production at Newcrest's Cadia Valley mine was down significantly due to an earthquake temporarily halting production while safety checks and remedial work was undertaken.

Grade wise for the companies that report AISC, the average reported mill head/feed grade was 3.35 g/t (Open Pit (OP) - 1.91 g/t, Underground (UG) - 4.70 g/t, Open Pit & Underground (OP/UG) - 2.51 g/t) which was down on the previous quarter, 3.41 g/t (-1.7%). Kirkland Lake's Fosterville mine took out the honour as the operation with the highest average feed grade with 17.20 g/t, followed by St Barbara's Gwalia mine 8.80 g/t. The lowest grade was shared between Evolution's Ernest Henry and Newcrest's Cadia Valley processing an average head grade of 0.56 g/t. The high-grade operations that do not report an AISC were Mandalay's Costerfield with 9.39g/t and Centennial Mining's A1 operation with 5.82 g/t.

Top 10 Gold Producing Operations

Rank	Operation	Company	Mine Type	Au Produced (oz)
1	Boddington	Newmont Mining Corporation	OP	212,000
2	Kalgoorlie	Newmont Mining Corporation / Barrick Gold Corporation	OP/UG	188,000
3	Tropicana	AngloGold Ashanti Limited / Independence Group NL	OP	110,509
4	St Ives	Gold Fields Limited	OP/UG	102,600
5	Tanami	Newmont Mining Corporation	UG	98,000
6	Telfer	Newcrest Mining Limited	OP/UG	88,688
7	Kalgoorlie Operations	Northern Star Resources Limited / Tribune Resources Limited / Rand Mining Limited	UG	85,392
8	Jundee	Northern Star Resources Limited	UG	84,854
9	Fosterville	Kirkland Lake Gold Limited	UG	77,069
10	Cadia Valley	Newcrest Mining Limited	UG	76,552

Supported By



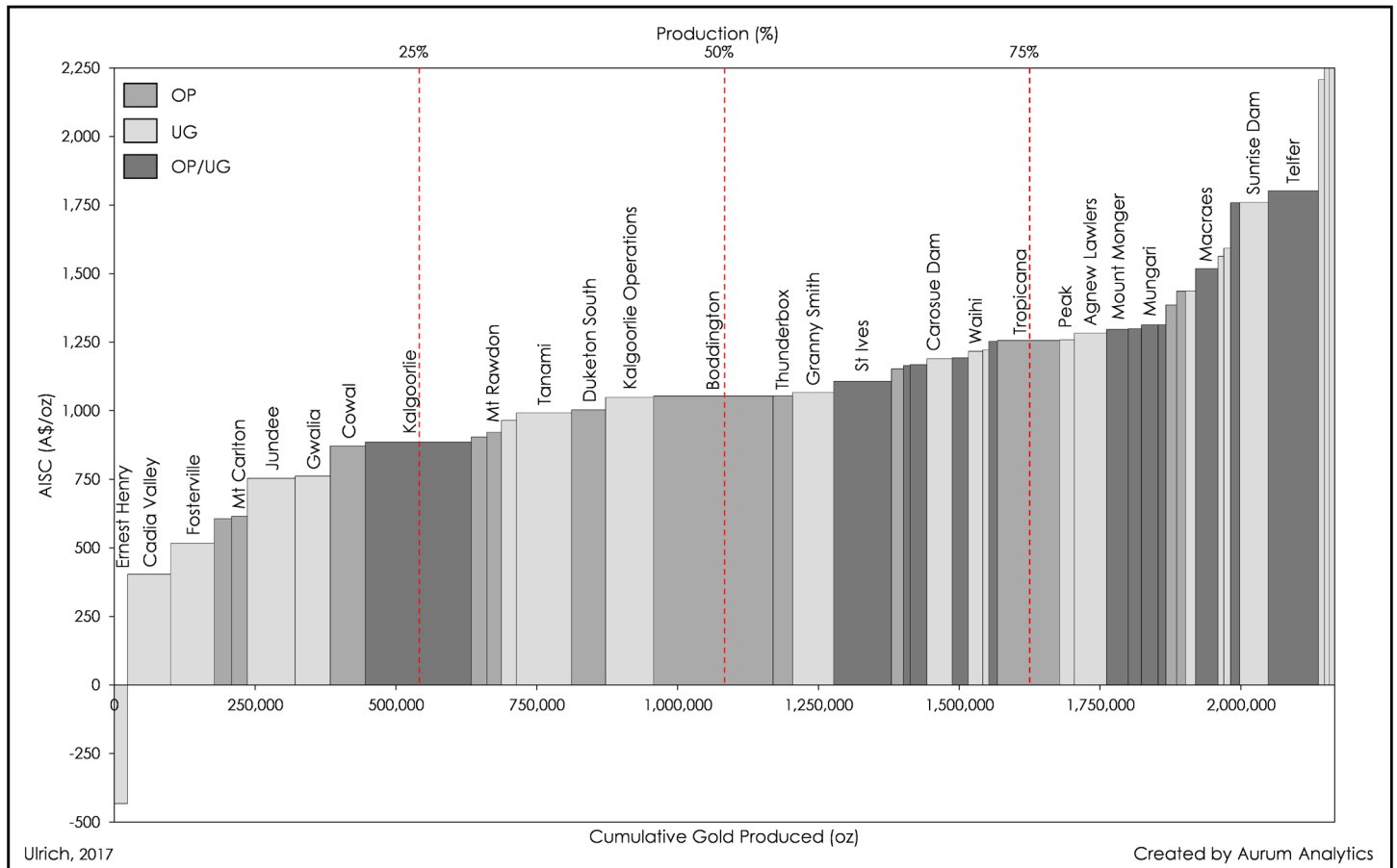
Capital Group

Gold Operations That Report AISC

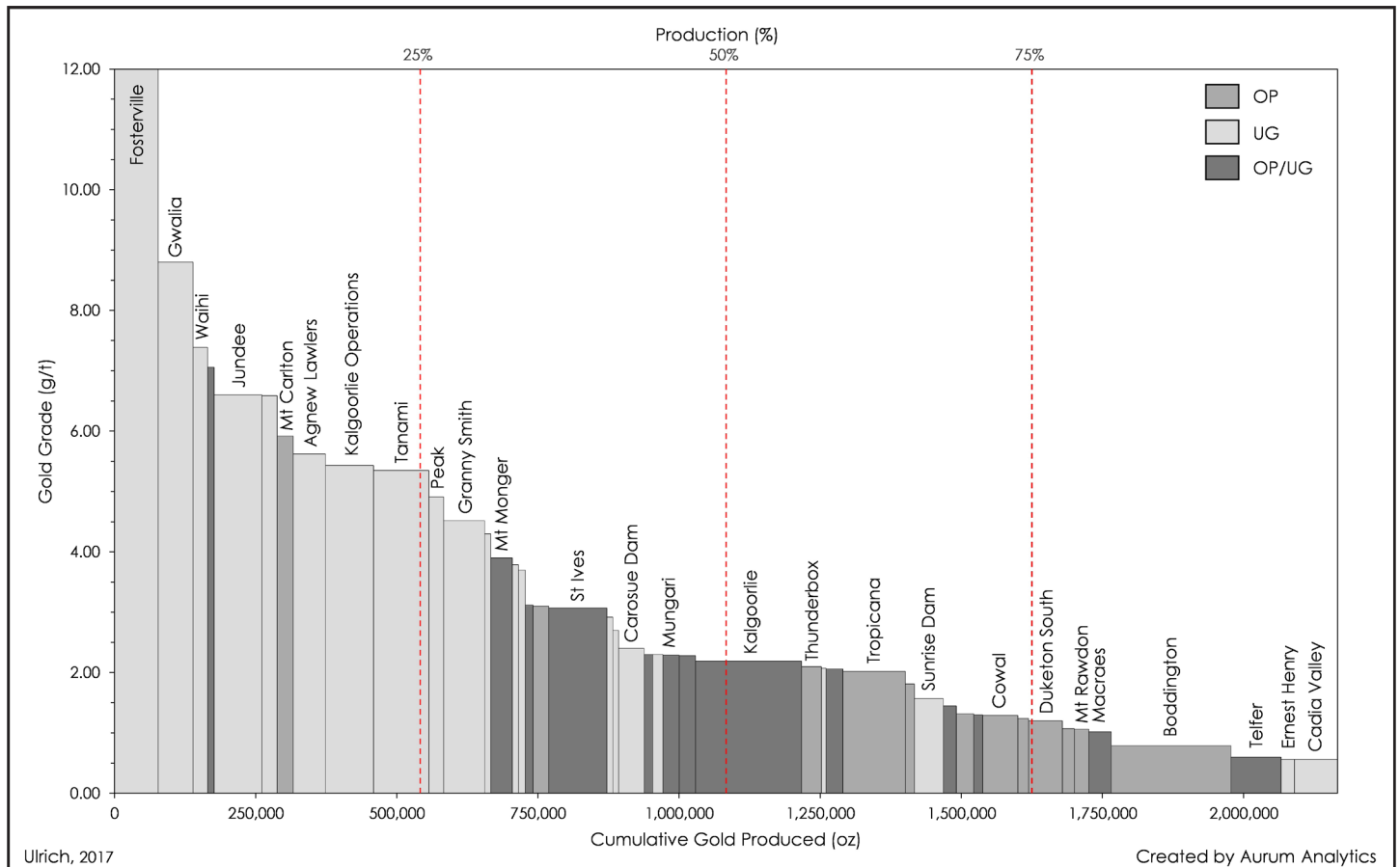
AISC Rank	Operation	Company	Mine Type	AISC (A\$/oz)	Grade (g/t)	Grade Rank	Au Produced (oz)
1	Ernest Henry	Evolution Mining Limited	UG	-432	0.56	45=	23,756
2	Cadia Valley	Newcrest Mining Limited	UG	404	0.56	45=	76,552
3	Fosterville	Kirkland Lake Gold Limited	UG	517	17.20	1	77,069
4	Duketon North	Regis Resources Limited	OP	606	1.32	35	30,520
5	Mt Carlton	Evolution Mining Limited	OP	616	5.92	7	28,270
6	Jundee	Northern Star Resources Limited	UG	754	6.60	5	84,854
7	Cowal	Evolution Mining Limited	OP	762	1.29	37	62,382
8	Gwalia	St Barbara Limited	UG	872	8.80	2	62,098
9	Kalgoorlie	JV Newmont/Barrick	OP/UG	886	2.19	27	188,000
10	Tomingley	Alkane Resources Limited	OP	905	3.10	18	27,924
11	Mt Rawdon	Evolution Mining Limited	OP	922	1.06	41	25,808
12	Cracow	Evolution Mining Limited	UG	965	6.59	6	26,792
13	Tanami	Newmont Mining Corporation	UG	993	5.35	10	98,000
14	Duketon South	Regis Resources Limited	OP	1,004	1.20	39	59,908
15	Kalgoorlie Operations	JV Northern Star/Tribune/Rand	UG	1,049	5.43	9	85,392
16	Boddington	Newmont Mining Corporation	OP	1,054	0.79	43	212,000
17	Thunderbox	Saracen Mineral Holdings Limited	OP	1,055	2.10	28	34,881
18	Granny Smith	Gold Fields Limited	UG	1,067	4.52	12	72,800
19	St Ives	Gold Fields Limited	OP/UG	1,107	3.07	19	102,600
20	Edna May	Evolution Mining Limited	OP	1,153	1.07	40	21,108
21	Nicolsons	Pantoro Limited	OP/UG	1,165	7.06	4	11,828
22	Mt Magnet Operation	Ramelius Resources Limited	OP/UG	1,168	2.06	30	29,889
23	Carosue Dam	Saracen Mineral Holdings Limited	UG	1,190	2.40	22	45,104
24	Central Murchison	Westgold Resources Limited	OP/UG	1,193	2.28	26	28,460
25	Waihi	OceanaGold Corporation	UG	1,217	7.39	3	25,559
26	Hera	Aurelia Metals Limited	UG	1,222	3.79	15	10,510
27	South Kalgoorlie	Westgold Resources Limited	OP/UG	1,254	2.30	23=	15,641
28	Tropicana	JV AngloGold/Independence	OP	1,256	2.02	31	110,509
29	Peak	New Gold Inc	UG	1,259	4.91	11	26,039
30	Agnew Lawlers	Gold Fields Limited	UG	1,283	5.62	8	57,200
31	Mount Monger	Silver Lake Resources Limited	OP/UG	1,297	3.90	14	38,366
32	Ravenswood	Resolute Mining Limited	OP/UG	1,300	1.45	34	23,552
33	Mungari	Evolution Mining Limited	OP/UG	1,313	2.29	25	29,338
34	Challenger	WPG Resources Limited	OP/UG	1,313	3.12	17	13,909
35	Nullagine	Millennium Minerals Limited	OP	1,386	1.24	38	18,983
36	Higginsville	Westgold Resources Limited	OP	1,436	1.81	32	16,208
37	Plutonic	Superior Gold Inc	UG	1,437	2.30	23=	17,556
38	Macraes Ops	OceanaGold Corporation	OP/UG	1,519	1.02	42	39,778
39	Andy Well	Doray Minerals Limited	UG	1,563	4.30	13	10,548
40	Paulsens	Northern Star Resources Limited	UG	1,593	3.70	16	12,089
41	Matilda-Wiluna	Blackham Resources Limited	OP/UG	1,758	1.30	36	15,720
42	Sunrise Dam	AngloGold Ashanti Limited	UG	1,759	1.57	33	51,000
43	Telfer	Newcrest Mining Limited	OP/UG	1,802	0.60	44	88,688
44	Darlot	Gold Fields Limited	UG	2,208	2.92	20	10,800
45	Beta Hunt	Royal Nickel Corporation	UG	2,380	2.07	29	8,281
46	Cosmo	Kirkland Lake Gold Limited	UG	2,488	2.70	21	10,213

Notes: Operations are shown on a 100% basis.

Gold Production Cost Curve Ranked By Reported AISC



Gold Production Grade Curve Ranked By Average Mill Feed/Head Grade



Gold Mines That Did Not Report All-in Sustaining Costs

Rank	Operation	Company	Mine Type	Grade (g/t)	Au Produced (oz)
1	Deflector	Doray Minerals Limited	UG	3.4	11,233
2	Kalgoorlie North	Excelsior Gold Limited	OP	2.48	10,310
3	Costerfield	Mandalay Resources Limited	UG	9.39	8,933
4	Ballarat	LionGold Corp Ltd	UG	4.4	7,563
5	A1	Centennial Mining Limited	UG	5.82	5,032
NR	Fortnum	Westgold Resources Limited	OP	0.98	2,061
NR	Pajingo	Minjar Gold Pty Ltd	UG	NA	NA
NR	Marvel Loch	Minjar Gold Pty Ltd	OP/UG	NA	NA
NR	Paddington	Zijin Mining Group Company Limited	OP/UG	NA	NA

1. These companies do not provide detailed quarterly production statistics for these mines.

Mines Where Gold Is A By-Product

Rank	Operation	Company	Mine Type	Au Produced (oz)
1	Prominent Hill	OZ Minerals Limited	OP/UG	32,136
2	Olympic Dam	BHP Billiton Limited	UG	28,188
3	Ernest Henry	Evolution Mining Limited	UG	23,756
4	DeGrussa	Sandfire Resources NL	UG	9,721
5	Rosebery	MMG Limited	UG	7,824
6	Kanmantoo	Hillgrove Resources Limited	OP	1,100
7	Jaguar	Independence Group NL	UG	556
NR	North Parkes ¹	China Molybdenum Co Ltd / Sumitomo Australia Pty Ltd	UG	NA
NR	Golden Grove	EMR Capital	UG	NA

1. North Parkes is a joint venture between China Molybdenum Co Ltd (80%) and Sumitomo Australia Pty Ltd (20%).

Quarter on Quarter Change in AISC and Grade

Statistic	AISC (A\$/oz)	Change (%)	Grade (g/t)	Change (%)
Average (Simple) ¹	1,196	-1.2	3.35	-1.7
Average (Weighted) ²	1,074	1.4	1.58	-4.1
Minimum	-432	-3.4	0.56	0.0
First Quartile	886	2.2	1.20	14.3
Median	1054	1.1	2.19	1.4
Third Quartile	1256	-0.9	5.35	10.3
Maximum	2,488	-3.9	17.20	53.6

1. Simple averages done by number of mining operations.

2. AISC weighted by gold ounces produced, Au grade weighted by ore tonnes milled.

3. First Quartile, Median and Third Quartile values are based on production in the AISC Cost Curve and Grade Curve.

Top 5 Gold Operations - Major Gold Miners

Gold Production (Attributable)			All-in Sustaining Costs		
Rank	Operation	oz	Rank	Operation	A\$/oz
1	Boddington	212,000	1	Cadia Valley	404
2	Kalgoorlie ¹	188,000	2	Kalgoorlie ¹	886
3	Tropicana ²	110,509	3	Boddington	1,054
4	St Ives	102,600	4	Tanami	1,059
5	Tanami	98,000	5	Granny Smith	1,067

1. Kalgoorlie is a joint venture between Newmont Mining Corporation (50%) and Barrick Gold Corporation (50%).

2. Tropicana is a joint Venture between AngloGold Ashanti Limited (70%) and Independence Group NL (30%).

Top 5 Gold Operations - Mid-Tier Gold Miners

Gold Production (Attributable)			All-in Sustaining Costs		
Rank	Operation	oz	Rank	Operation	A\$/oz
1	Jundee	84,854	1	Ernest Henry	-432
2	Fosterville	77,069	2	Fosterville	517
3	Cowal	62,382	3	Duketon North	606
4	Gwalia	62,098	4	Mt Carlton	616
5	Duketon South	59,908	5	Jundee	754

1. Kalgoorlie Operations gold produced represents Northern Star Resources Limited's attributable gold produced only.

Top 5 Gold Operations - Junior Gold Miners

Gold Production (Attributable)			All-in Sustaining Costs		
Rank	Operation	oz	Rank	Operation	A\$/oz
1	Mount Monger	38,366	1	Tomingley	905
2	Mt Magnet Operation ¹	29,889	2	Nicolsons	1,165
3	Tomingley	27,924	3	Mt Magnet Operation ¹	1,168
4	Kalgoorlie Operations ²	21,164	4	Hera	1,222
5	Nullagine	18,983	5	Mount Monger	1,297

1. Mt Mganet Operation is Ramelius Resources Limited's Mt Magnet and Vivien mines.

2. Kalgoorlie Operations gold produced represents Tribune Resources Limited's attributable gold production from the East Kundana Joint Venture.

Top 5 Pure Gold Operations (No Base Metal By or Co-Products)

Gold Production (Total)			All-in Sustaining Costs		
Rank	Operation	oz	Rank	Operation	A\$/oz
1	Kalgoorlie ¹	188,000	1	Fosterville	517
2	Tropicana ²	110,509	2	Duketon North	606
3	St Ives	102,600	3	Jundee	754
4	Tanami	98,000	4	Cowal	762
5	Kalgoorlie Operations ³	85,392	5	Gwalia	872

1. Kalgoorlie is a joint venture between Newmont Mining Corporation (50%) and Barrick Gold Corporation (50%).

2. Tropicana is a joint venture between AngloGold Ashanti Limited (70%) and Independence Group NL (30%).

3. Kalgoorlie Operations gold produced represents total gold attributable to Northern Star Resources Limited, Tribune Resources Limited and Rand Mining Limited.

General Notes

Data was sourced from company quarterly reports. Aurum Analytics created the cost and grade curves. Mine Type reflects the source of the ore mined for the quarter, OP - Open Pit, UG - Underground, OP/UG - Open Pit and Underground and NM - No Mining.

For operations in joint venture such as Kalgoorlie and Tropicana AISC values were apportioned by equity ownership percentages. Kalgoorlie Operations is based on Northern Star Resources Limited's reported AISC only as Tribune Resources Limited and Rand Mining Limited do not report an AISC.

Where AISC values were reported in US\$ and no A\$ equivalent provided, the quarterly average US\$/A\$ exchange rate (0.7504) from the Reserve Bank of Australia was used.

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About Aurum Analytics

Aurum Analytics is an independent business providing information and analysis on the Australian and New Zealand gold industry. The information and analysis given is a by-product of Sam Ulrich's PhD research at The University of Western Australia's Centre for Exploration Targeting titled "Geological drivers and strategic implications of competitive advantage in Australian and New Zealand gold mines, linking geology to mine economics."

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