

Resource Centre  
Policy Branch  
Dept. of Minerals & Energy



ROYALTIES AND STATISTICS BRANCH

**STATISTICAL DIGEST OF  
MINERAL PRODUCTION  
1987/88**



DEPARTMENT OF MINES  
WESTERN AUSTRALIA

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MINERAL PRODUCTION  
1987/88

COMPILED BY:

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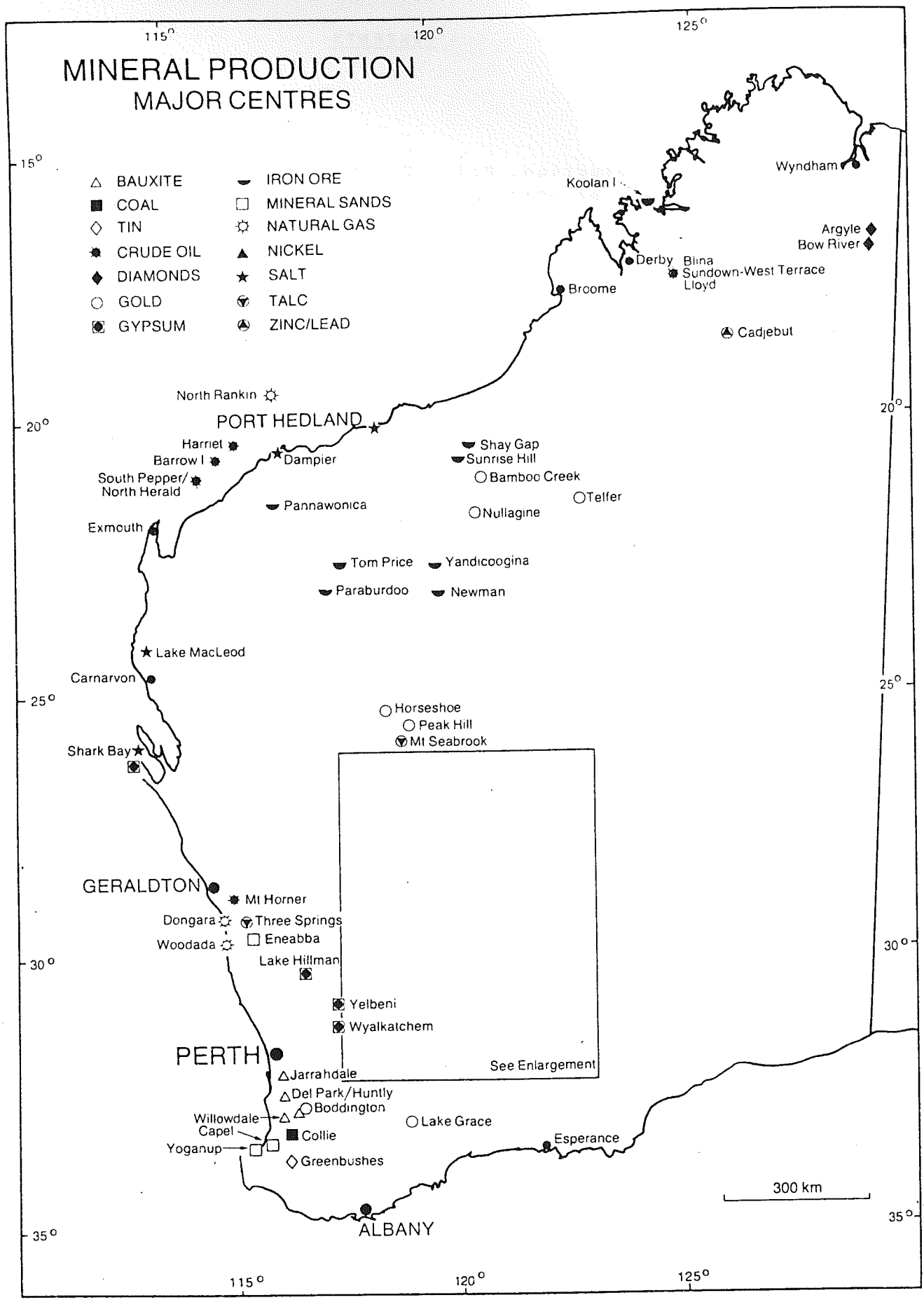
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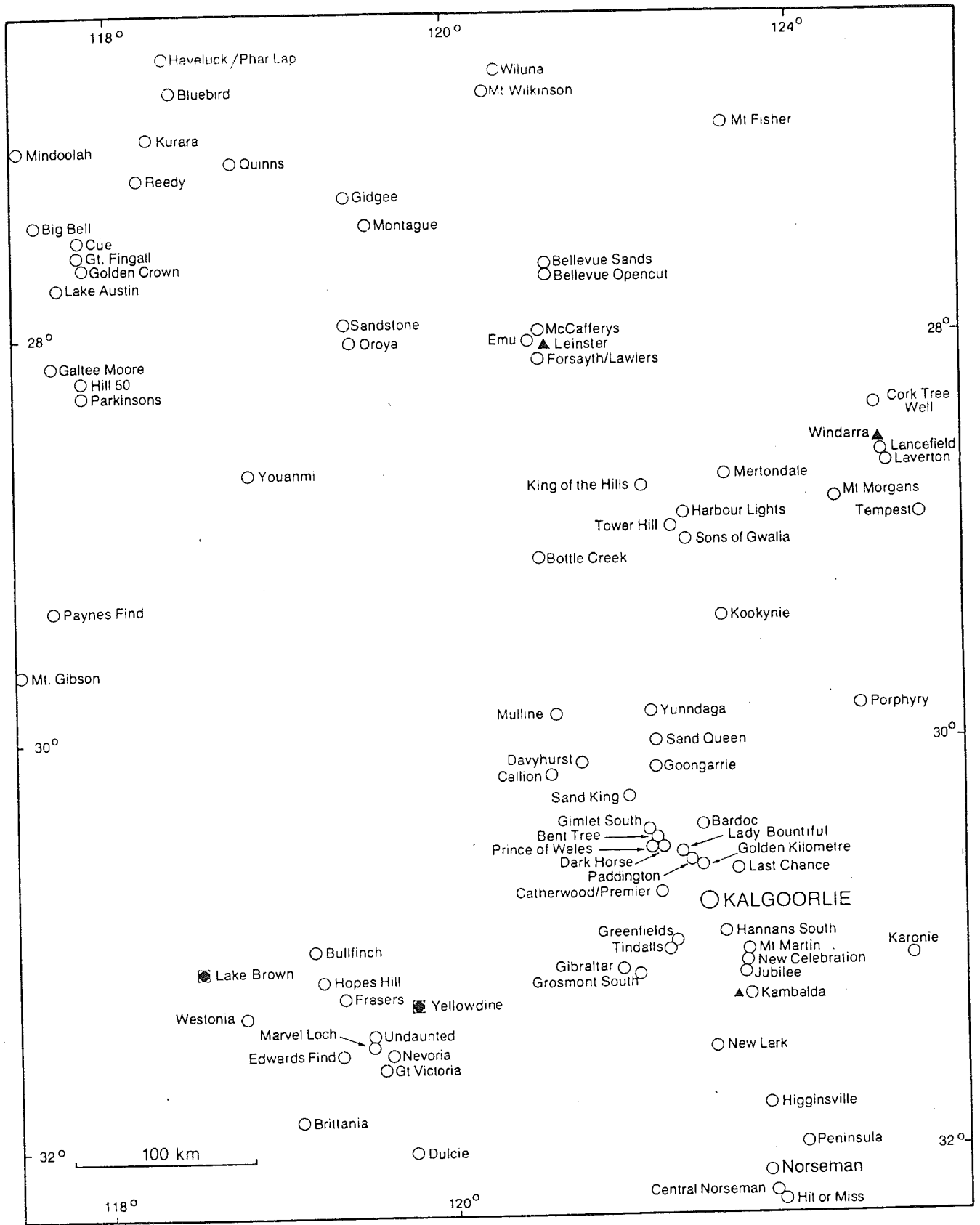
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# MINERAL PRODUCTION MAJOR CENTRES

- |             |                 |
|-------------|-----------------|
| △ BAUXITE   | ☪ IRON ORE      |
| ■ COAL      | □ MINERAL SANDS |
| ◇ TIN       | ☼ NATURAL GAS   |
| ★ CRUDE OIL | ▲ NICKEL        |
| ◆ DIAMONDS  | ★ SALT          |
| ○ GOLD      | ☉ TALC          |
| ⊗ GYPSUM    | ⊗ ZINC/LEAD     |





○ GOLD

▲ NICKEL

■ GYPSUM

## WESTERN AUSTRALIA MINERAL PRODUCTION TRENDS

### OVERVIEW

The value of mineral production in Western Australia rose by \$1,089.8 million to reach \$6,945.6 million. This is only \$54.4 million short of a milestone \$7 billion and reflects a broadly based improvement across a number of mineral sectors combined with a continuing improvement in the gold industry.

Over the past few years gold has dominated the improvements in mining performance while most other sectors have tended to remain relatively quiet. In 1986/87 the value of gold production rose by \$590m while the value of all other minerals fell by \$50m this combined to result in an overall rise of \$540m to \$5,856.4m in total value.

1987/88 contrasts with this as other minerals contributed a net increase of \$545 million or 50% of the rise in the total value of production, with gold making up the other 50% of the \$1.1 billion increase.

The Western Australian mining industry is dominated by nine major mineral sectors which have consistently accounted for about 99% of the total value of mineral production. In 1986/87 three of these major sectors suffered falls in their value of production, however, in 1987/88 only the diamond sector suffered a decline in value of production.

This evidence indicates a broadly based recovery in Western Australia's mineral industry which has been achieved despite the strengthening of the Australian dollar over the period. The effects of exchange rate movements are significant and it should be noted that just a one cent change in the SA:\$US exchange rate can cause a change of about \$80m in the overall value of production.

### IRON ORE

Shipments of iron ore rose dramatically from 78mt in 1986/87 to over 95mt in 1987/88, a record for a 12 month period. However, price falls and exchange rate movements combined to limit the benefit of this strong sales performance, consequently total value rose by \$71.8m to \$1,867.2m. If 1986/87 prices and exchange rates had applied to the 1987/88 period, the value of iron ore shipments would have risen a further \$320m.

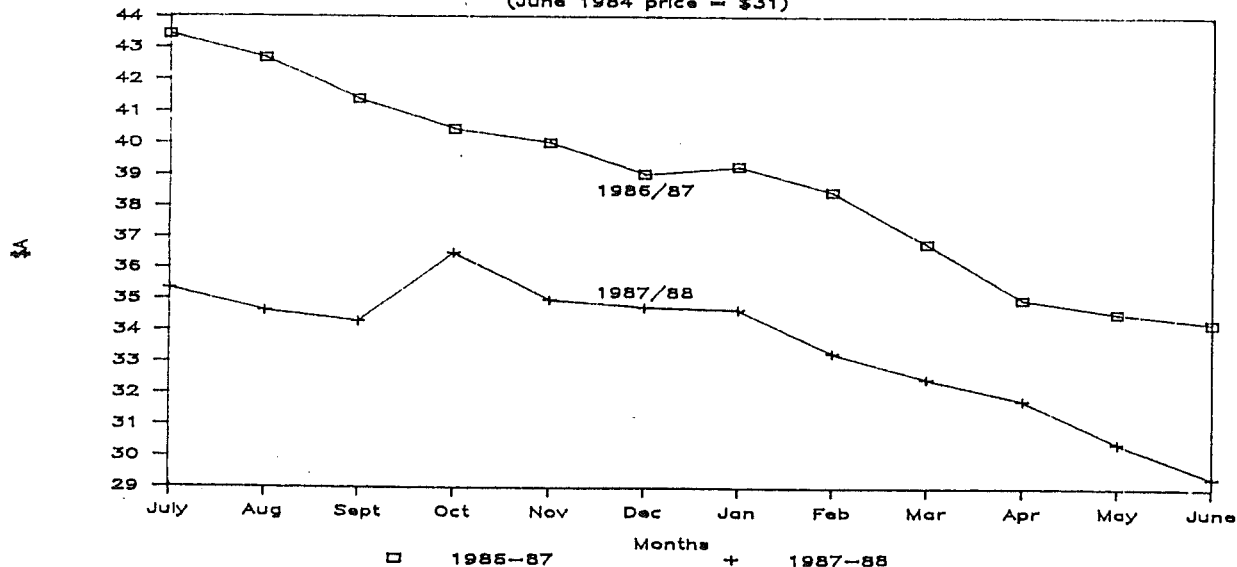
Only the B.H.P. Koolan Island mine and Goldsworthy's Shay Gap operations shipped less in 1987/88 than in 1986/87 as both mines are reaching the end of their present reserves. All other mines shipped greater tonnages with Robe River the largest improver reflecting greater productivity and more stable industrial relations. Mt Newman shipments increased by 20% and Hamersley by 16% to complete the overall strong improvement in iron ore sales.

The major factor behind the good results of the iron ore sector has been the recovery in the world steel industry. The past year has witnessed a substantial return to profitability in the world's traditional steel manufacturing areas constituting the United States, Japan and Europe as well as the continuing success of the newer steel producing nations of Asia.

The steel industry's better performance is attributed to higher prices worldwide, growing construction demand in Japan, a rebuilding of stocks in the United States and increased vehicle output in Europe. As these areas of demand become satisfied, the possibility of a slowdown in the steel industry will increase. If this eventuates it will have a consequent impact on iron ore demand. However, for the 1988/89 iron ore year, Western Australian companies have full order books and it is expected that new record tonnages could be set if these orders are fulfilled.

### IRON ORE - Price : \$A/tonne

(June 1984 price = \$31)



SOURCE: HAMERSLEY HIGH GRADE LUMP PRICES.

### GOLD

Once again the improvement in gold production has dominated the performance of the Western Australian mining industry.

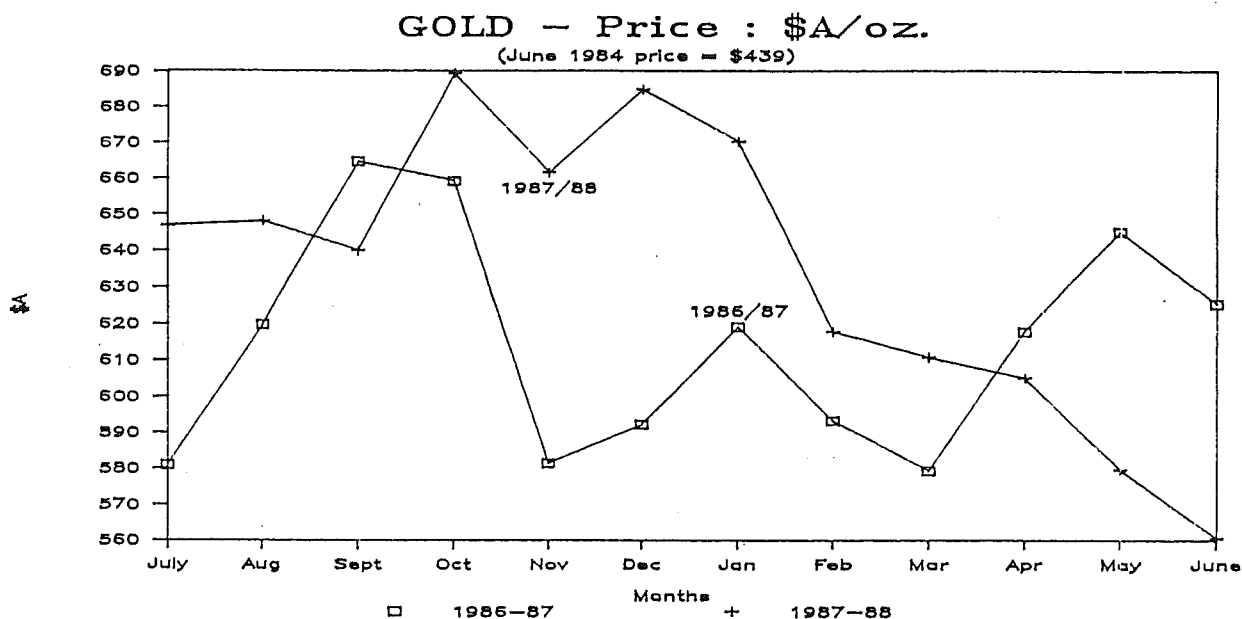
Gold production rose from 64.9 tonnes in 1986/87 to 90.5 tonnes in 1987/88, an increase of 39.5%. With the slightly higher average gold price in 1987/88 the value of production rose by 41.8% from \$1,300.1 million in 1986/87 to reach \$1,843.8 million. It is expected that by 1990 production will be exceeding 130 tonnes on an annual basis worth over \$2 billion at today's prices. If achieved this production would be more than double the record output of the gold rush era of 61 tonnes in 1903.

The structure of the Western Australian gold industry has changed significantly in this decade. In 1980 there were only three mines where individual production exceeded 10,000ozs per annum. The top 10 producers contributed 94% of the State's gold output with a combined production of 340,000ozs (10.6 tonnes).

By 1987/88 there were 67 mines where individual production exceeded 10,000ozs and the top 10 producer's total output of 1.4 million ozs (44.4 tonnes) contributed 49% of total State gold production.

The average gold price received for the year was marginally higher at \$654.68 per oz compared to \$643.93 in 1986/87. However, as can be seen below, the trend in the last half of the year was downwards. World gold markets have alternatively been buoyed and depressed as fears of global inflation rose than receded, moreover, the decline in oil prices and forward selling of gold have added to falls which for a time saw gold prices dip below US\$400 per oz.

Forward selling of gold is a recently prominent feature of the gold industry. This procedure is now widely undertaken and it protects producers from fluctuations in the price of gold by locking in a contract price for a number of years. It has been estimated that about a half of Australia's gold output is forward sold. Some producers have up to 80% of their output committed in forward sales at gold prices which range up to \$700 per oz thus guaranteeing profits while the industry's average operating costs of around \$300 per oz are maintained.



SOURCE: LONDON GOLD PRICE, MONTHLY AVERAGE OF WEDNESDAY PRICES.



## ALUMINA

The upswing in the price of aluminium which commenced in the first half of 1987 has helped create improved market conditions for alumina.

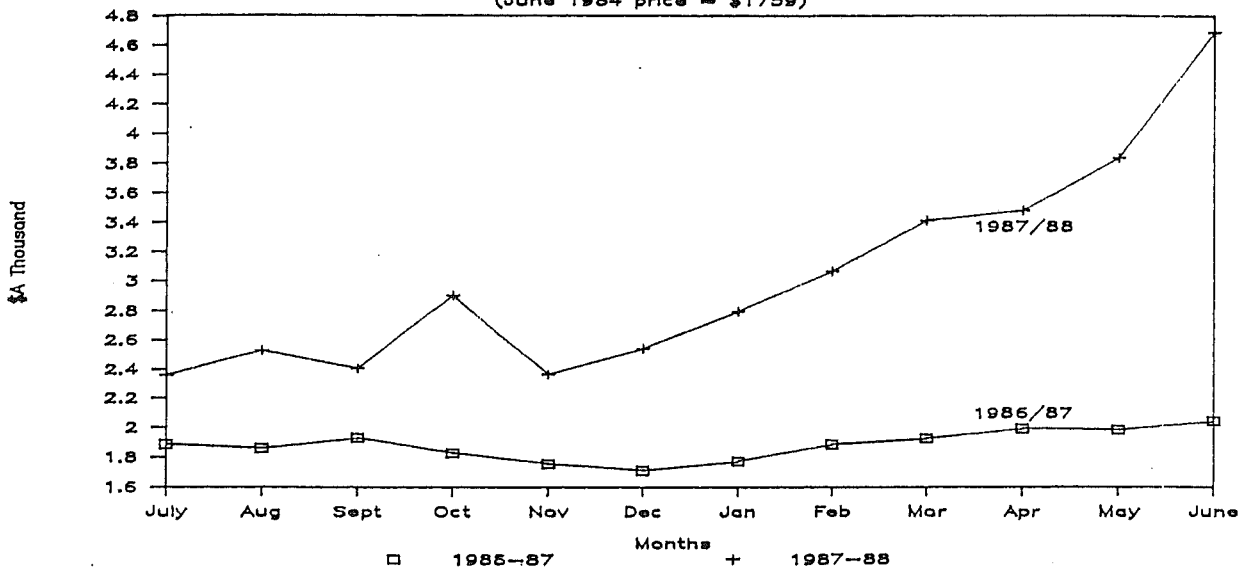
The quantity of alumina produced rose 335,000 tonnes on 1986/87 production of 5.7mt to reach 6.1mt in 1987/88.

Higher prices and the increased output combined to raise the value of alumina produced to \$1,183 million up 8.4% on the 1986/87 figure of \$1,090 million giving rise to some optimism in the W.A. alumina industry.

However, a general strengthening of the \$A against other currencies and increases in the cost of caustic soda, a major element in the processing of alumina, dampened otherwise strong gains in the alumina industry.

### ALUMINIUM - Prices : \$A/tonne

(June 1984 price = \$1759)



SOURCE: L.M.E. HIGH GRADE CASH, MONTHLY AVERAGE OF WEDNESDAY PRICES.

## PETROLEUM

The value of petroleum produced in Western Australia rose from \$630m in 1986/87 to \$790m in 1987/88 despite the declining oil price.

Condensate production rose by 80% with the value of production increasing by \$93.4m, the N.W.S. was again the major contributor.

Western Australia's crude oil production was worth \$304.4m representing a 15.8% increase over 1986/87. In 1987/88 crude oil production was up 358,000kl to 1,933,000kl a 22.7% rise on 1986/87 production.

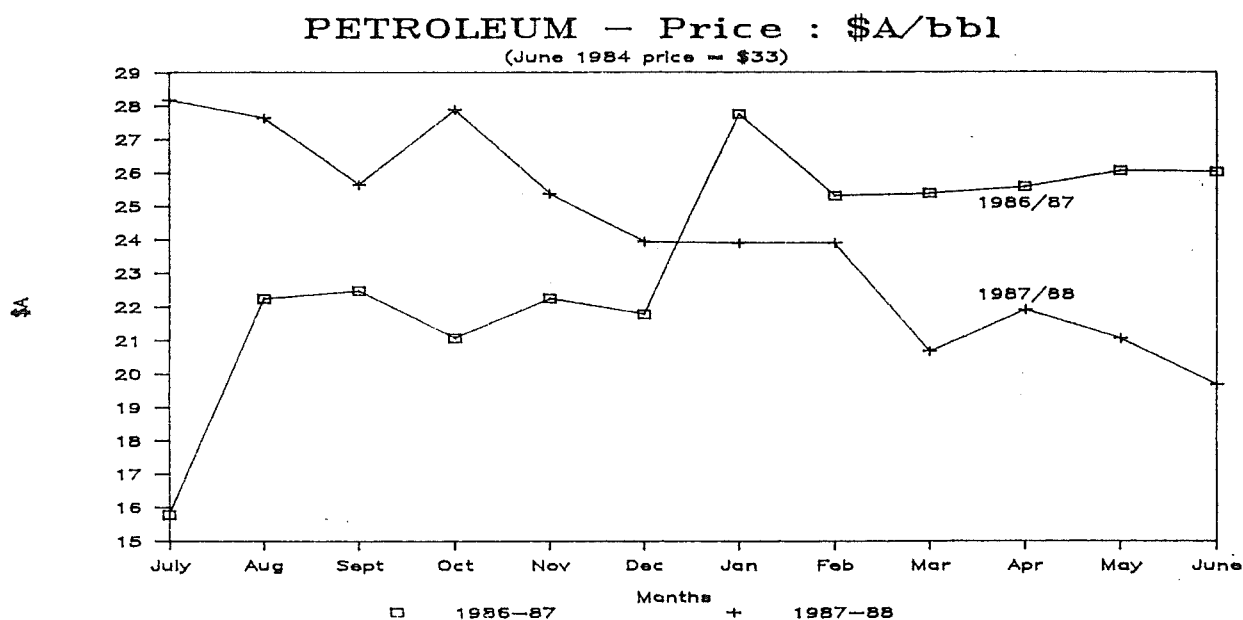
The value of natural gas produced in Western Australia rose by 15.3% or \$42.5m to reach \$320.5m in 1987/88. Average gas prices were slightly higher but the increase in value is mainly attributable to the 13.4% increase in quantity produced.

A steady fall in petroleum prices from \$28 per barrel in July 1987 to \$19.50 per barrel in June 1988 did not dampen the level of exploration or production of petroleum in Western Australia.

1987/88 saw a large increase in the level of exploration activity in Western Australia. 31 exploration wells were drilled both on and offshore, compared with only 16 wells in 1986/87.

Offshore exploration was concentrated in the Carnarvon Basin, with successful finds being recorded near Varanus Island and Thevenard Island.

Onshore exploration was accelerated in the Canning Basin where 20 wells were drilled. Two wells, West Terrace 2 and Lloyd 1 encountered geologically significant oil accumulations and they may become productive in the near future.



SOURCE: BRENT SPOT, MONTHLY AVERAGE OF WEDNESDAY PRICES.

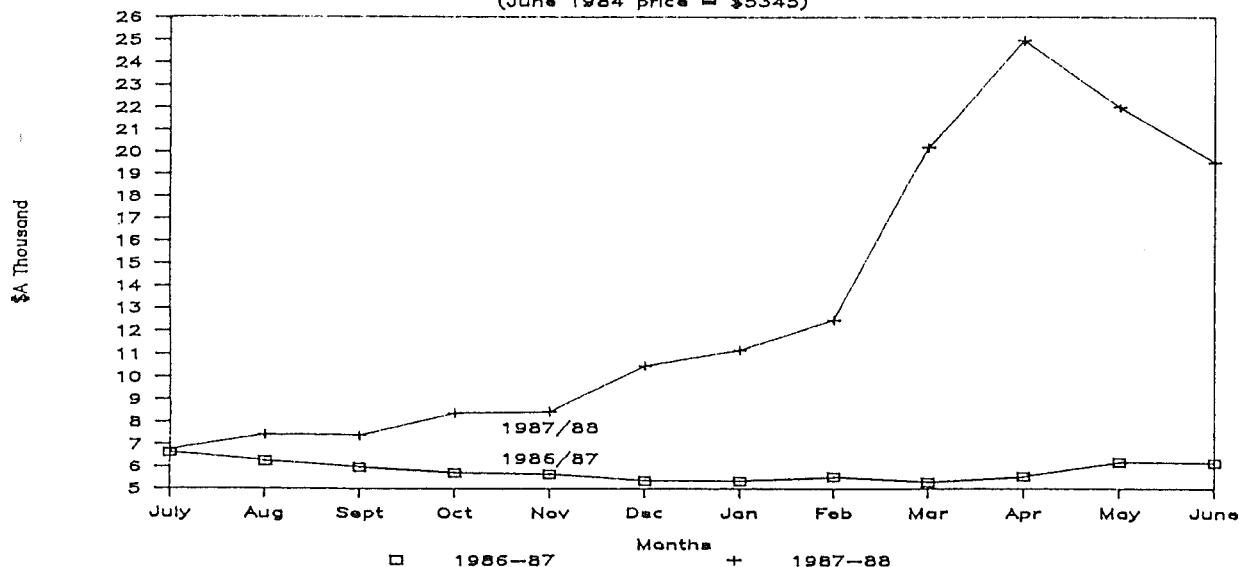
## NICKEL

Although nickel concentrate production fell to 388,964t in 1987/88 down 4% on 1986/87's production of 406,321t, the value of the concentrate produced increased a massive 48% up \$127 million to \$392 million in 1987/88 on 1986/87's value of \$265 million.

Extremely sharp price rises were recorded from February to March 1988 in response to a number of temporary supply shortages. The spectacular price rises have come after nearly five years of depressed prices and is indicative of a stronger market for future years.

### NICKEL - Prices : \$A/tonne

(June 1984 price = \$5345)



SOURCE: L.M.E. CASH, MONTHLY AVERAGE OF WEDNESDAY PRICES.

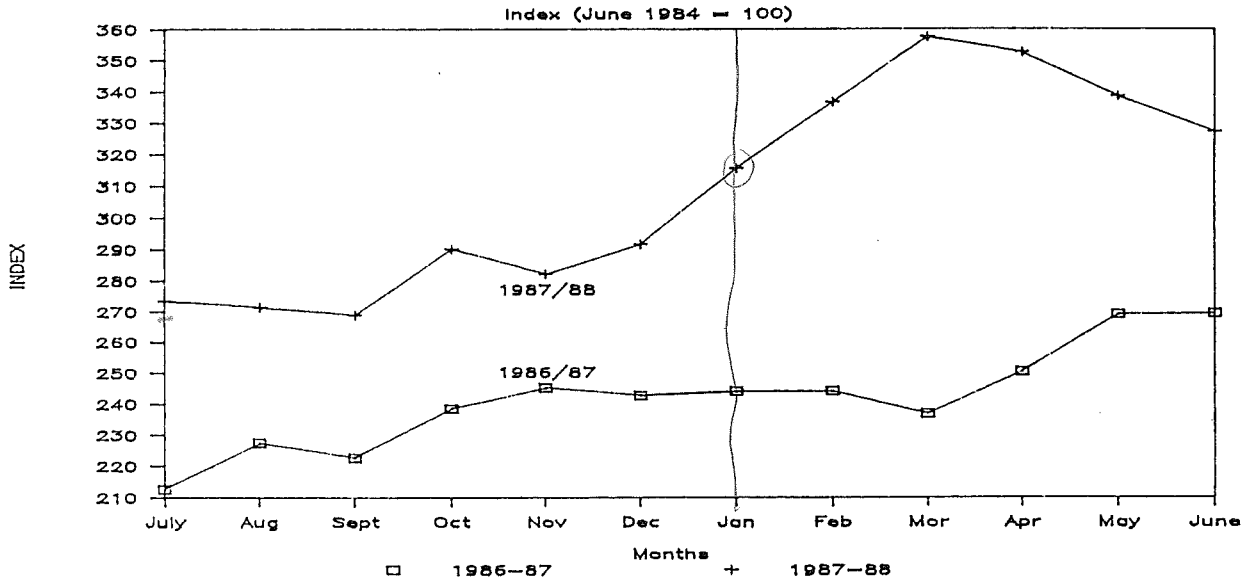
## MINERAL SANDS

Strong increases in the price of rutile and ilmemite caused the Mineral Sands Index to rise dramatically. The value of production for mineral sands increased substantially from \$196.6 million in 1986/87 to \$223.7 million in 1987/88. The higher value of production was mainly due to higher zircon prices and increases in the quantity of upgraded ilmemite (synthetic rutile) produced following the commissioning of two new synthetic rutile plants.

Western Australia is a significant producer of mineral sands on the world scene, producing 30% of world's ilmemite supplies and 50% of monazite. W.A. also supplies significant quantities of rutile and zircon to world markets.

The graph below represents an index of the prices for the three major mineral sands products produced in W.A., ilmenite, rutile and zircon. It has been constructed using a weighting for the respective prices based on an average contribution to the total value of mineral sands production over the last 5 years.

### PRICE INDEX FOR MINERAL SANDS



SOURCE: LONDON PRICES, AS DETAILED IN TEXT ABOVE.

### DIAMONDS

In 1987/88 the value of diamonds produced in Western Australia was \$248.2 million, down \$35.9 million on the 1986/87 figure of \$284.1 million. However, Australia is still ranked fifth after the USSR, Botswana, South Africa and Namibia in terms of the value of diamonds produced. The decline in the value of production was caused mostly by a decrease in the quantity of diamonds produced. Production fell from 32.2M cts in 1986/87 to 30.2M cts in 1987/88 despite the Bow River Diamond project commencing during the year.

### MINERAL EXPLORATION

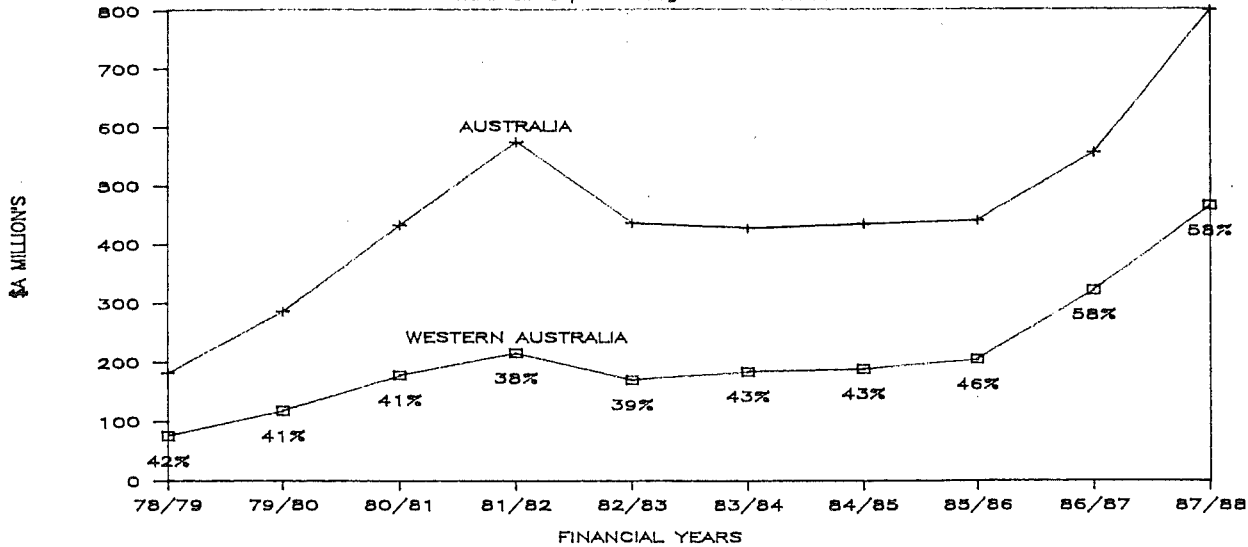
Mineral exploration expenditure in Australia for the 1987/88 financial year was at an all time high of \$799.2 million up 44% on 1986/87's figure of \$556.8 million. 58% of this or \$466.3 million was spent in Western Australia.

In 1987/88 \$360.9 million was spent on Gold exploration in Western Australia, this was approximately 80% of total exploration expenditure and represents a 50% increase on 1986/87's expenditure of \$240.3 million. Other commodities experiencing substantial increases in exploration expenditure were diamonds up 68% to \$18.1 million and Base Metals up 48% to \$40.9 million.

The graph following suggests a healthy level of exploration which is essential for the continued growth of Western Australia's mining industry.

## EXPLORATION EXPENDITURE

W.A. as a percentage of AUSTRALIA



SOURCE: AUSTRALIAN BUREAU OF STATISTICS

### SUMMARY AND OUTLOOK

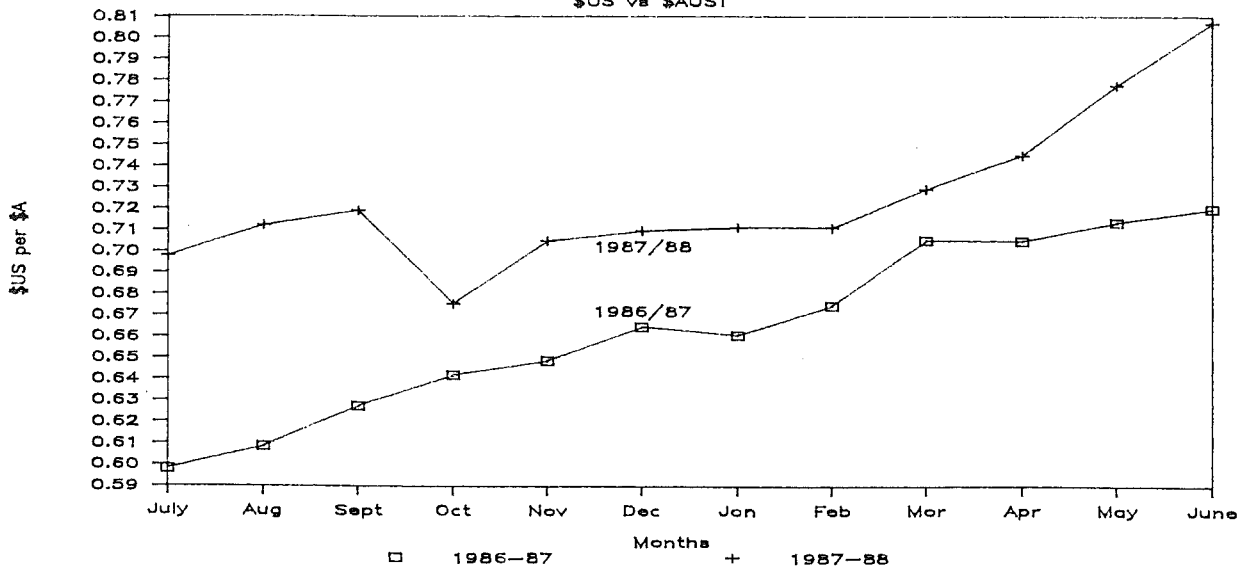
Some mineral commodity prices such as those for Alumina, Nickel and Mineral Sands rose during 1987/88. Others such as Iron Ore, Petroleum, Diamonds and Gold experienced price falls over the same period.

It can therefore be suggested that, while higher commodity prices played a significant part in the continued steady growth in the Western Australian mineral sector, increases in production were a major feature of the past year's performance. An overall 18.6% growth in the value of mineral production indicates that W A's mining companies are still very well rated by the world's major mineral buyers.

The above growth has been achieved despite a gradual improvement in the Australian dollar exchange rate, which would have been expected to decrease Australia's competitiveness against other major mineral producing countries.

### EXCHANGE RATE COMPARISON

\$US vs \$AUST



SOURCE: AUSTRALIAN FINANCIAL REVIEW, MONTHLY AVERAGE OF DAILY PRICES.

TABLE 1  
QUANTITY AND VALUE OF MINERALS 1986/87, 1987/88

Mineral	Unit	1986/87		1987/88	
		Quantity	Quantity	Value (\$A)	Quantity
Alumina	t	5 727 327	1 090 879 157	6 063 130	1 182 997 535
Barytes	t	-	-	9 669	1 160 280
Building Stone					
black granite	t	585	50 000	-	-
quartz	t	1 861	83 755	294	13 210
Clay					
attapulgitic	t	10 458	n.a.	11 387	n.a.
cement clay	t	23 991	59 969	22 679	56 698
fire clay	t	208 895	252 326	191 184	381 127
kaolin	t	7 460	241 564	185	11 187
white clay	t	72 176	209 528	1 697	20 364
Coal	t	3 795 055	141 742 231(r)	3 701 942	150 965 157
Cobalt	t	463	4 012 332	325	3 521 185
Construction Material					
aggregate	t	100 816	581 430	261 853	1 314 472
gravel	t	22 365	28 965	5 989	38 905
rock	t	116 222	187 560	315 395	3 265 965
sand	t	1 271 826	3 786 995	1 618 124	4 602 471
sandstone	t	20	40	-	-
Copper	t	3 519	4 106 685	2 071	5 938 229
Diamond	ct	32 164 524	284 094 805	30 218 355	248 202 718
Diatomite	t	401	2 006	124	682
Dolomite	t	243	3 162	130	2 060
Emerald	g	200	1 784	-	-
Felspar	t	4 405	68 814	9 602	387 558
Garnet Sand	t	12 122	427 334	17 890	630 044
Gold	kg	64 911	1 300 079 190	90 546	1 843 770 410
Gypsum	t	233 404	2 673 698	99 162	947 660
Iron Ore	t	78 026 315	1 678 811 297(r)	95 177 702	1 867 172 034
Kyanite	t	955	153 220	826	114 799
Limestone	t	194 895	1 251 642	170 194	1 581 478
Mineral Beach Sand					
ilmenite	t	1 038 922	57 843 880(r)	946 494	63 934 291
reduced ilmenite	t	53	13 250(r)	-	-
upgraded ilmenite(a)	t	61 178	22 899 652(r)	195 504	69 996 495
leucoxene	t	12 606	5 140 988	10 882	4 581 114
monazite	t	12 407	8 417 755	9 705	6 960 550
rutile	t	82 462	46 089 968	85 078	51 168 571
xenotime	t	43	328 846	-	-
zircon	t	310 576	56 297 397	366 053	97 148 148
Nickel Concentrate	t	406 321	264 726 489	388 964	391 749 276
Nickel Ore	t	59 257	10 065 723	-	-
Palladium	kg	490	3 218 062	454	2 842 171
Peat	t	1 641	51 669	879	52 794
Petroleum Products					
condensate	kl	512 434	76 464 584(r)	1 140 514	169 911 500
crude oil	kl	1 574 655	262 843 620	1 932 597	304 355 749
natural gas	1000m <sup>3</sup>	3 199 165	277 989 304	3 629 175	320 504 994
Platinum	kg	105	2 645 121	82	1 936 029
Salt	t	5 051 148	107 382 344	5 533 859	107 165 215
Semi-precious Stone					
amethyst	kg	51 000	195 500	51 000	195 500
Silica Sand	t	371 165	2 279 997(r)	402 995	2 985 987
Silver	kg	11 160	1 971 953	12 673	2 295 547
Spodumene	t	8 221	1 855 601	24 471	4 397 393
Talc	t	179 241	n.a.	169 612	n.a.
Tantalite	t	108	4 224 365	133	5 676 606
Tin Concentrate	t	731	4 882 698	434	2 855 928
Vermiculite	t	819	16 388	1 679	87 072
Zinc Concentrate	t	-	-	7 223	2 805 427
<b>Total Value</b>			<b>5 855 841 549(r)</b>		<b>6 945 636 791</b>

Note: (r) Revised from Previous Edition  
(a) Also known as synthetic rutile

Figure 1

### 1982/83 VALUE OF PRODUCTION

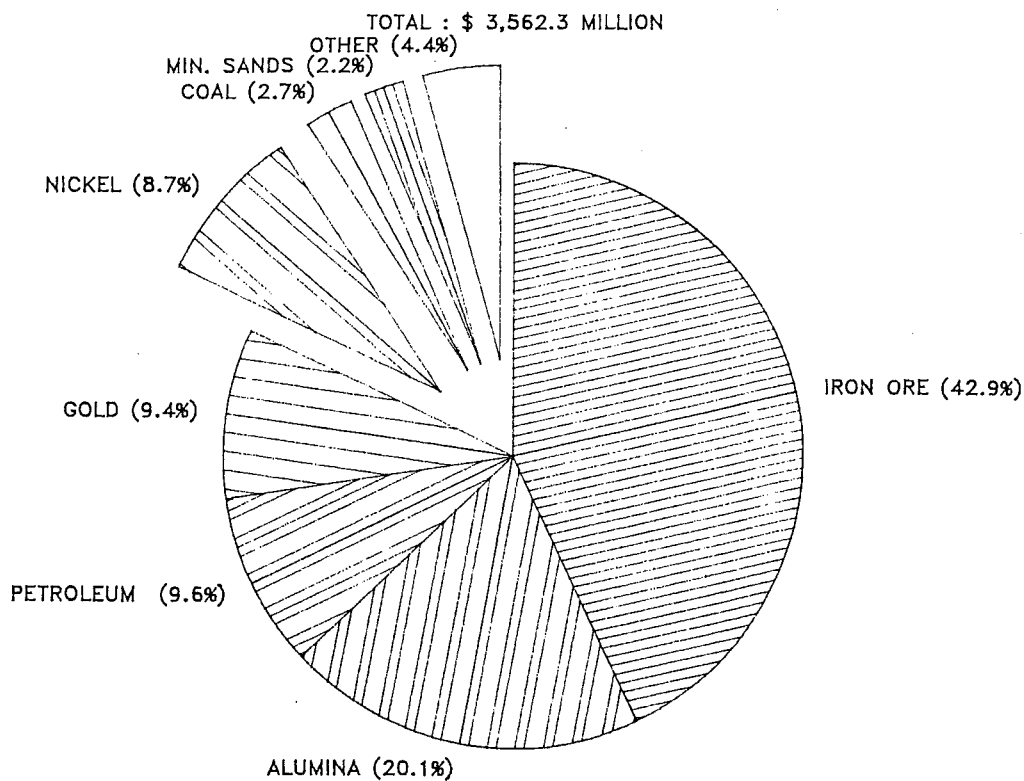


Figure 2

### 1987/88 VALUE OF PRODUCTION

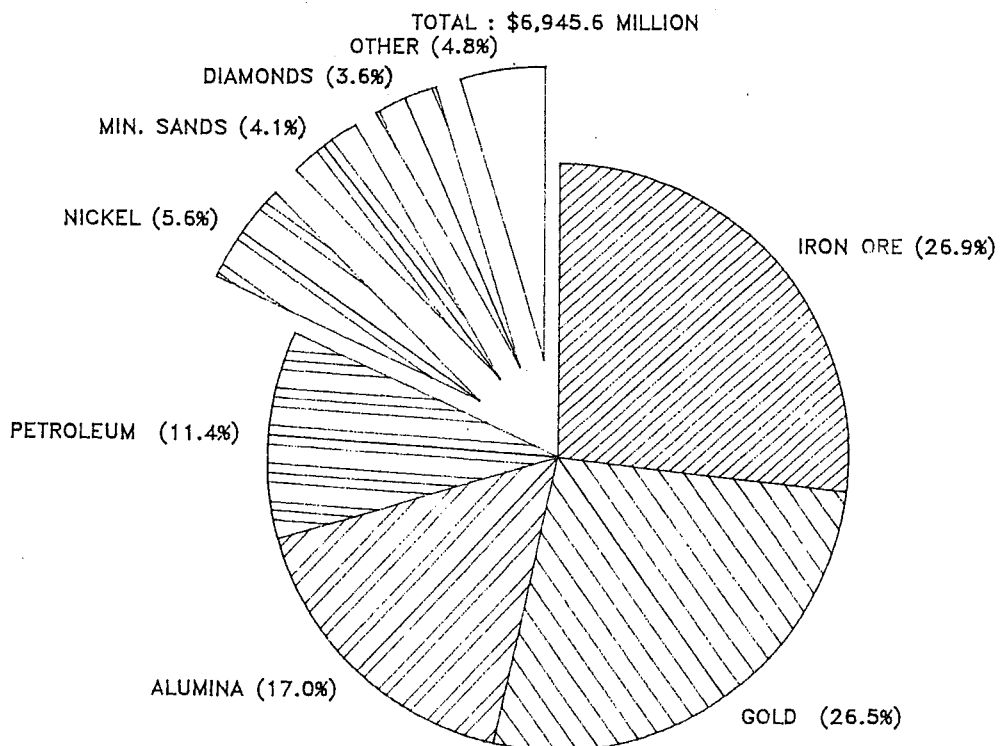


TABLE 2  
 QUANTITY AND VALUE OF MINERALS  
 SHOWING MINERAL-FIELD AND METALLIC CONTENT

Mineral	Mineral-field	Quantity tonnes	Metallic Content	Value (\$)	Ref.
Alumina ✓	South West	6 063 130		1 182 997 535	(a)
Barytes ✗	Pilbara	9 669		1 160 280	(b)
Building stone					
- quartz rock ✗	South West	294		13 210	(b)
Clay ✗					
- attapulgite ✗	South West	11 387		N.A.	
- cement clay ✗	South West	22 679		56 698)	
- fire clay ✗	South West	191 184		381 127)	(b)
- kaolin ✗	Greenbushes	185		11 187)	
- white clay ✗	South West	1 697		20 364)	
Coal ✗	Collie	3 701 942		150 965 157	(c)
Cobalt ✓	Coolgardie		† 324.684	3 521 185	(d), (e)
Construction Materials ✗					
- aggregate ✗	East Coolgardie	227 795		957 328	
	Kimberley	6 526		26 104	
	Pilbara	19 447		256 900	
	West Kimberley	8 085		74 140	
		261 853		1 314 472	
- gravel ✗	Coolgardie	3 309		16 545	
	West Pilbara	2 680		22 360	
		5 989		38 905	
- rock ✗	South West	225 339		2 028 051	
	West Kimberley	35 892		610 174	
	West Pilbara	54 164		627 740	
		315 395		3 265 965	



Mineral	Mineral-field	Quantity tonnes	Metallic Content	Value (\$)	Ref.
- sand ✗	Coolgardie	24 191		148 437	
	Mt Margaret	157		314	
	Peak Hill	14 912		82 376	
	Pilbara	13 302		77 021	
	South West	1 503 767		3 768 965	
	West Pilbara	61 795		525 358	
		1 618 124		4 602 471	
Total Construction Materials		2 201 361		9 221 813	(b)
			+		
Copper ✓	Coolgardie		2 701.496	5 938 229	(d), (e)
			ct		
Diamonds ✗	Kimberley		30 218 355	248 202 718	(d)
Diatomite ✗	South West	124		682	(c)
Dolomite ✗	South West	130		2 060	(c)
Felspar ✗	South West	9 602		387 558	(f)
Garnet Sand ✓	South West	17 890		630 044	(c), (g)
			kg		
Gold ✓	State-wide	90 545.779		1 843 770 410	
Gypsum ✗	South West	71 396		794 319	(b), (c)
	Yilgarn	27 766		153 341	(b)
Total Gypsum		99 162		947 660	

Mineral	Mineral-field	Quantity tonnes	Metallic Content	Value (\$)	Ref.
Av. Assay Fe %					
Iron Ore ✓					
Interstate					
- ore	Peak Hill	3 968 418	65.78	85 326 903	
	West Kimberley	1 479 040	66.50	16 266 460	
		5 447 458		101 593 363	
Exported					
- ore	Peak Hill	31 163 240	63.00	667 015 810	
	Pilbara	4 111 165	61.67	77 423 343	
	West Pilbara	51 812 871	61.19	967 284 020	
	West Kimberley	2 102 165	66.54	42 352 612	
		89 189 441		1 754 075 785	
- pellets	West Pilbara	540 803	63.26	11 502 886	
		89 730 244		1 765 578 671	
Total Iron Ore		95 177 702		1 867 172 034	(d)
Kyanite	South West	826		114 799	(d)
Limestone	South West	126 828		1 294 978	
	West Pilbara	43 366		286 500	
Total Limestone		170 194		1 581 478	(b)

Mineral	Mineral-field	Quantity tonnes	Metallic Content	Value (\$)	Ref.
Av. Assay TiO <sub>2</sub> %					
Mineral Beach Sands					
- ilmenite ✓	South West	946 494	56.28	63 934 291	
- upgraded ilmenite	South West	195 504	92.00	69 996 495	
TiO <sub>2</sub> +					
- leucoxene ✓	South West	10 882	9 841	4 581 114	
Th O <sub>2</sub> 10kg units					
- monazite ✓	South West	9 705	63 990	6 960 550	
TiO <sub>2</sub> +					
- rutile ✓	South West	85 078	80 822	51 168 571	
ZrO <sub>2</sub> +					
- zircon ✓	South West	366 053	239 976	97 148 148	
Total Mineral Beach Sands				293 789 169	(d)
Av. Assay Ni%					
Nickel Concentrates					
	Coolgardie	278 265	11.40	288 087 264	
	East Coolgardie	32 573	11.70	34 630 549	
	Mt Margaret	78 126	9.57	69 031 463	
Total Nickel		388 964		391 749 276	(h)
kg					
Palladium ✓	Coolgardie		453.847	2 842 171	(d), (e)
Peat	South West	879		52 794	(b)

Mineral	Mineral-field	Quantity tonnes	Metallic Content	Value (\$)	Ref.
		kl			
Petroleum	Basin				
- condensate	Carnarvon	1 139 584		169 750 000	(d)
	Perth	930		161 500	(b)
		1 140 514		169 911 500	
- crude oil	Canning	41 968		6 721 774	
	Carnarvon	1 877 143		295 764 487	
	Perth	13 486		1 869 488	
			1 932 597		304 355 749
		$m^3 10^3$			
- natural gas	Carnarvon	3 372 291		294 385 000	(b)
	Perth	256 884		26 119 994	(f)
		3 629 175		320 504 994	
Total Petroleum				794 772 243	
		kg			
Platinum ✓	Coolgardie		81.822	1 936 029	(d), (e)
Salt ✗	Gascoyne	1 533 398		30 374 588	(d)
	Pilbara	2 020 062		37 453 010	(d)
	South West	250		6 250	(c)
	West Pilbara	1 980 149		39 331 367	(d)
Total Salt		5 533 859		107 165 215	
Semi-precious stones		t			
- amethyst	Gascoyne		51	195 500	(c)

Mineral	Mineral-field	Quantity tonnes	Metallic Content	Value (\$)	Ref.
Silica X	Coolgardie	44 575		109 206	
	South West	358 420		2 876 781	
Total Silica		402 995		2 985 987	(d)
Silver ✓			kg		
By-product of gold mining	State-wide		12 017.680	2 088 648	
	Coolgardie		655.207	206 899	(d), (e)
Total Silver			12 672.887	2 295 547	
Spodumene ✓	Greenbushes	24 471		4 397 393	(d)
Talc X	South West	169 612		N.A.	
			Ta <sub>2</sub> O <sub>5</sub> kg		
Tantalite X	Greenbushes	133	147 421	5 676 606	(d)
			Sn t		
Tin ✓	Greenbushes	434	304	2 855 928	(d)
Vermiculite X	Phillips River	1 679		87 072	(c)
			Zn t		
Zinc ✓	West Kimberley	7 223	4 059	2 805 427	(d)
Value of Gold				1 843 770 410	
Value of other Minerals				5 101 866 381	
TOTAL VALUE OF ALL MINERALS				6 945 636 791	

## ABBREVIATIONS

cons.	concentrates	f.o.t.	free on truck
f.o.b.	free on board	n.a.	not available
f.o.r.	free on rail	n.ap.	not applicable

## REFERENCES

- (a) Value based on the average Australian value of alumina as published by the Bureau of Mineral Resources in the Australian Mineral Industry Review.
- (b) Value at works.
- (c) Estimated ex-mine value.
- (d) Estimated f.o.b. value.
- (e) Metallic by-product of nickel mining.
- (f) Estimated f.o.r. value.
- (g) Estimated f.o.t. value.
- (h) Estimated f.o.b. value based on the current price of nickel containing products.
- (i) Delivered value.

## UNITS AND CONVERSION FACTORS

			Conversion factors		
	Metric unit	Symbol	Imperial unit	Multiply Imperial unit by	Multiply metric unit by
Mass	gram	g	troy (fine) ounce (oz)	31.103522	0.032151
	kilogram	kg	pound (lb)	0.453592	2.204624
	tonne	t	long ton (2240 lbs)	1.016046	0.984207
	tonne	t	short ton (2000 lbs)	0.907185	1.102311
Volume	kilolitre	kl	barrel (bbl)	6.28981	0.158987
	kilolitre	kl	cubic metre (m <sup>3</sup> )	1	
Energy	kilojoule ( Typical natural gas	kj	British thermal unit (BTU) 39 MJ/M <sup>3</sup> )	1.05506	0.94781
Prefix	kilo (k)	10 <sup>3</sup>			
	mega (M)	10 <sup>6</sup>			
	giga (G)	10 <sup>9</sup>			
	tera (T)	10 <sup>12</sup>			

**TABLE 3**  
**QUANTITY AND VALUE OF MINERALS BY LOCAL GOVERNMENT AREA**

Mineral	Local Government Area	Quantity tonnes	Metallic Content	Value (\$)	Ref.
Alumina	Boddington	1 074 744		211 331 040	
	Harvey	664 668		129 561 885	
	Murray	2 804 500		546 697 625	
	Serpentine-Jarrahdale	1 519 218		295 406 985	
		6 063 130		1 182 997 535	(a)
Barytes	East Pilbara	9 669		1 160 280	(b)
Building stone					
- quartz rock	Mukinbudin	294		13 210	(b)
Clay					
- attapulgitic	Mullewa	11 387		N.A.	
- cement clay	Armadale	22 679		56 698)	
- fire clay	Chittering	189 534		377 827)	
	Victoria Plains	1 650		3 300)	
- kaolin	Bridgetown-Greenbushes	185		11 187)	(b)
- white clay	Serpentine-Jarrahdale	1 697		20 364)	
Total Clay		277 132		469 376	
Coal	Collie	3 701 942		150 965 157	(c)
Cobalt	Coolgardie		† 324.684	3 521 185	(d), (e)
Construction Materials					
- aggregate	Boulder	227 795		957 328	
	Derby-West				
	Kimberley	8 085		74 140	
	Port Hedland	19 447		256 900	
	Wyndham-East				
	Kimberley	6 526		26 104	
		261 853		1 314 472	
- gravel	Ashburton	900		900	
	Coolgardie	3 309		16 545	
	Roebourne	1 780		21 460	
		5 989		38 905	

Mineral	Local Government Area	Quantity tonnes	Metallic Content	Value (\$)	Ref.
Construction Materials (cont)					
- rock	Broome	35 892		610 174	
	Cockburn	225 339		2 028 051	
	Roebourne	54 164		627 740	
		315 395		3 265 965	
- sand	Canning	214 480		312 558	
	Cockburn	1 037 610		2 951 385	
	Coolgardie	24 191		148 437	
	Dandaragan	1 897		11 382	
	Laverton	157		314	
	Meekatharra	14 912		82 376	
	Northam	77 228		116 370	
	Port Hedland	13 302		77 021	
	Roebourne	61 795		525 358	
	Wanneroo	172 552		377 270	
		1 618 124		4 602 471	
Total Construction Materials		2 201 361		9 221 813	(b)
†					
Copper	Coolgardie		2 701,496	5 938 229	(d), (e)
ct					
Diamonds	Wyndham-East Kimberley		30 218 355	248 202 718	(d)
Diatomite	Dandaragan	124		682	(c)
Dolomite	Lake Grace	130		2 060	(c)
Felspar	Mukinbudin	9 602		387 558	(f)
Garnet Sand	Capel	422		186 664	(g)
	Northampton	17 468		611 380	(c)
		17 890		630 044	
kg					
Gold	State-wide		90 545,779	1 843 770 410	



Mineral	Local Government Area	Quantity tonnes	Metallic Content	Value (\$)	Ref.
Gypsum	Dalwallinu	28 936		556 564	(b), (c)
	Kellerberrin	1 550		7 750	
	Lake Grace	3 028		15 140	
	Merredin	1 039		5 818	
	Narembeen	2 700		16 200	
	Nungarin	28 653		154 558	(c)
	Trayning	20 284		113 591	
	Wyalkatchem	11 669		68 149	
	Yilgarn	1 303		9 890	
Total Gypsum		99 162		947 660	
Av. Assay Fe %					
Iron Ore					
Interstate					
- ore	East Pilbara	3 968 418	65.78	85 326 903	
	Derby-West				
	Kimberley	1 479 040	66.50	16 266 460	
		5 447 458		101 593 363	
Exported					
- ore	Ashburton	51 812 871	61.19	967 284 020	
	Derby-West				
	Kimberley	2 102 165	66.54	42 352 612	
	East Pilbara	35 274 405	62.84	744 439 153	
		89 189 441		1 754 075 785	
- pellets	Ashburton	540 803	63.26	11 502 886	
		89 730 244		1 765 578 671	
Total Iron Ore		95 177 702		1 867 172 034	(d)
Kyanite	Carnamah	826		114 799	(d)
Limestone					
Limestone	Dandaragan	887		4 435	
	Gingin	15 119		322 265	
	Irwin	569		2 845	
	Roebourne	4 790		46 979	
	Wanneroo	148 829		1 204 954	
Total Limestone		170 194		1 581 478	(b)

Mineral	Local Government Area	Quantity tonnes	Metallic Content	Value (\$)	Ref.
Av. Assay TiO <sub>2</sub> %					
Mineral Beach Sands					
- ilmenite	Capel	705 233	54.92	50 159 125	
	Carnamah	241 261	60.26	13 775 166	
		946 494		63 934 291	
- upgraded ilmenite	Capel	128 482	92.00	44 299 928	
	Carnamah	67 022	92.00	25 696 567	
		195 504		69 996 495	
TiO <sub>2</sub> †					
- leucoxene	Capel	10 882	9 841	4 581 114	
Th O <sub>2</sub> 10kg units					
- monazite	Capel	2 222	15 350	1 617 723	
	Carnamah	7 483	48 640	5 342 827	
		9 705	63 990	6 960 550	
TiO <sub>2</sub> †					
- rutile	South West	85 078	80 822	51 168 571	
ZrO <sub>2</sub> †					
- zircon	Capel	196 153	58 997	22 611 294	
	Carnamah	259 900	170 979	74 436 854	
		366 053	239 976	97 148 148	
Total Mineral Beach Sands				293 789 169	(d)
Av. Assay Ni%					
Nickel Concentrates					
	Boulder	32 573	11.70	34 630 549	
	Coolgardie	278 265	11.40	288 087 264	
	Laverton	78 126	9.57	69 031 463	
Total Nickel		388 964		391 749 276	(h)
kg					
Palladium	Coolgardie		453.847	2 842 171	(d),(e)
Peat	Manjimup	879		52 794	(b)

Mineral	Local Government Area	Quantity tonnes	Metallic Content	Value (\$)	Ref.
kl					
Petroleum					
- condensate	Carnamah	54		9 656	(b)
	Irwin	876		151 844	(b)
	Roebourne	1 139 584		169 750 000	(d)
		1 140 514		169 911 500	
-----					
- crude oil	Derby-West				
	Kimberley	41 968		6 721 774	
	Irwin	13 486		1 869 488	
	Roebourne	1 877 143		295 764 487	
		1 932 597		304 355 749	(d)
-----					
m <sup>3</sup> 10 <sup>3</sup>					
- natural gas	Carnamah	7 692		440 070	(f)
	Irwin	249 192		25 679 924	(f)
	Roebourne	3 372 291		294 385 000	(b)
		3 629 175		320 504 994	
-----					
Total Petroleum				794 772 243	
-----					
kg					
Platinum	Coolgardie		81.822	1 936 029	(d), (e)
-----					
Salt	Carnarvon	951 868		19 821 162	(d)
	Lake Grace	250		6 250	(c)
	Port Hedland	2 020 062		37 453 010	(d)
	Roebourne	1 980 149		39 331 367	(d)
	Shark Bay	581 530		10 553 426	(d)
Total Salt		5 533 859		107 165 215	
-----					
Semi-precious stones					
t					
- amethyst	Upper Gascoyne		51	195 500	(c)
-----					

Mineral	Local Government Area	Quantity tonnes	Metallic Content	Value (\$)	Ref.
Silica	Canning	107 908		1 186 988	
	Capel	8 036		104 468	
	Cockburn	208 644		1 399 428	
	Coolgardie	44 575		109 206	
	Wanneroo	33 832		185 897	
Total Silica		402 995		2 985 987	(d)
<hr/>					
Silver			kg		
By-product of gold mining	State-wide		12 017.680	2 088 648	
	Coolgardie		655.207	206 899	(d), (e)
Total Silver			12 672.887	2 295 547	
<hr/>					
Spodumene	Bridgetown-Greenbushes	24 471		4 397 393	(d)
<hr/>					
Talc	Meekatharra	22 364		N.A.	
	Three Springs	147 248		N.A.	
Total Talc		169 612		N.A.	
<hr/>					
			Ta <sub>2</sub> O <sub>5</sub> kg		
Tantalite	Bridgetown-Greenbushes	133	147 421	5 676 606	(d)
<hr/>					
			Sn t		
Tin	Bridgetown-Greenbushes	434.350	303.950	2 855 928	(d)
<hr/>					
Vermiculite	Ravensthorpe	1 679		87 072	(c)
<hr/>					
			Zn t		
Zinc	Derby-West Kimberley	7 223	4 059	2 805 427	(d)
<hr/>					
				1 843 770 410	
				5 101 866 381	
				6 945 636 791	

TABLE 4  
GOLD PRODUCTION (KG) AND ORE TREATED 1987/88  
SHOWING MINERAL-FIELD AND DISTRICT

DISTRICT MINERAL-FIELD	ALLUVIAL KILOGRAMS	DOLLIED AND SPECIMENS KILOGRAMS	MILLED OR SMELTERED		TAILING RETREATMENT KILOGRAMS	TOTAL GOLD KILOGRAMS
			ORE TREATED (TONNES)	GOLD THEREFROM KILOGRAMS		
KIMBERLEY	24.022	0.049	5	0.036	-	24.107
WEST KIMBERLEY	-	-	-	-	-	-
MARBLE BAR	11.649	0.034	2 177 948	7 071.084	77.535	7 160.302
NULLAGINE	64.333	1.901	20 916	274.576	-	340.810
PILBARA	75.982	1.935	2 198 864	7 345.660	77.535	7 501.112
WEST PILBARA	17.232	2.031	-	-	-	19.263
ASHBURTON	3.846	-	-	-	-	3.846
GASCOYNE	2.095	0.677	352	4.347	-	7.119
PEAK HILL	35.569	3.455	296 740	873.711	-	912.735
LAWLERS	6.207	0.809	1 310 020	3 868.822	99.643	3 975.481
WILUNA	0.067	-	1 152 423	3 684.961	482.228	4 167.256
BLACK RANGE	1.688	1.834	857 386	2 957.758	37.873	2 999.153
EAST MURCHISON	7.962	2.643	3 319 829	10 511.541	619.744	11 141.890
CUE	25.690	0.966	282 594	1 364.243	15.056	1 405.955
MEEKATHARRA	5.285	0.121	1 970 410	4 757.053	3.270	4 765.729
DAY DAWN	23.289	0.058	81 110	1 047.827	65.044	1 136.218
MT MAGNET	17.973	0.160	1 005 004	3 490.424	1.372	3 509.929
MURCHISON	72.237	1.305	3 339 118	10 659.547	84.742	10 817.831
YALGOO	1.010	0.114	699 241	1 798.234	-	1 799.358
MT MORGANS	4.746	-	128 491	388.777	2.896	396.419
MT MALCOLM	3.160	0.744	1 502 714	4 886.380	750.362	5 640.646
MT MARGARET	10.387	1.475	578 458	1 636.557	137.826	1 786.245
MT MARGARET	18.293	2.219	2 209 663	6 911.714	891.084	7 823.310
MENZIES	0.107	-	529 763	1 178.594	29.294	1 207.995
ULARRING	-	-	175 069	459.425	14.202	473.627
NIAGARA	3.681	0.044	8 489	21.370	35.787	60.882
YERILLA	-	-	235 040	685.271	3.128	688.399
NORTH COOLGARDIE	3.788	0.044	948 361	2 344.660	82.411	2 430.903
BROAD ARROW	0.189	-	3 016 695	8 130.898	113.507	8 244.594

DISTRICT MINERAL-FIELD	ALLUVIAL KILOGRAMS	DOLLIED AND SPECIMENS KILOGRAMS	MILLED OR SMELTERED		TAILINGS RETREATMENT KILOGRAMS	TOTAL GOLD KILOGRAMS
			ORE TREATED (TONNES)	GOLD THEREFROM KILOGRAMS		
KANOWNA	0.357	0.024	94 178	188.857	15.135	204.373
KURNALPI	0.864	-	189 059	425.838	-	426.702
NE COOLGARDIE	1.221	0.024	283 237	614 695	15.135	631.075
EAST COOLGARDIE	0.987	0.034	5 415 377	16 402.232	452.050	16 855.303
BULONG	1.693	-	56	0.109	-	1.802
EAST COOLGARDIE	2.680	0.034	5 415 433	16 402.341	452.050	16 857.105
COOLGARDIE	4.570	-	2 001 002	5 587.578	57.834	5 649.982
KUNANALLING	0.262	-	67 814	170.151	4.430	174.843
COOLGARDIE	4.832	-	2 068 816	5 757.729	62.264	5 824.825
YILGARN	6.098	0.507	3 884 904	6 745.423	38.292	6 790.320
DUNDAS	-	-	509 668	2 920.114	0.105	2 920.219
PHILLIPS RIVER	-	-	6 341	20.229	-	20.229
SOUTH WEST	-	-	2 228 402	6 775.938	-	6 775.938
<b>TOTAL</b>	<b>277.056</b>	<b>15.037</b>	<b>30 425 669</b>	<b>87 816.817</b>	<b>2 436.869</b>	<b>90 545.779</b>

TABLE 5  
GOLD PRODUCTION (KG) AND ORE TREATED 1987/88  
SHOWING LOCAL GOVERNMENT AREA

LOCAL GOVERNMENT AREA	ALLUVIAL KILOGRAMS	DOLLIED AND SPECIMENS KILOGRAMS	MILLED OR SMELTERED		TAILINGS RETREATMENT KILOGRAMS	TOTAL GOLD KILOGRAMS
			ORE TREATED (TONNES)	GOLD THEREFROM KILOGRAMS		
BODDINGTON	-	-	2 125 846	6 478.081	-	6 478.081
BOULDER	-	-	8 690 116	25 082.827	576.114	25 658.941
COOLGARDIE	-	-	2 054 276	5 732.532	60.470	5 793.002
CUE	55.403	-	710 215	3 519.478	65.044	3 639.925
DUNDAS	-	-	508 308	2 916.508	-	2 916.508
EAST PILBARA	58.089	-	2 198 856	7 344.075	76.632	7 478.796
HALLS CREEK	16.020	-	-	-	-	16.020
LAKE GRACE	-	-	102 556	297.857	-	297.857
LAVERTON	3.190	-	670 468	1 966.232	135.140	2 104.562
LEONORA	1.002	-	2 822 956	8 658.984	850.006	9 509.992
MEEKATHARRA	35.370	3.455	2 462 514	5 848.673	-	5 887.498
MENZIES	-	-	956 541	2 394.256	77.648	2 471.904
MT MAGNET	5.925	-	1 698 483	5 283.378	-	5 289.303
PORT HEDLAND	5.861	-	-	-	-	5.861
RAVENSTHORPE	-	-	6 143	17.747	-	17.747
ROEBOURNE	15.922	-	-	-	-	15.922
SANDSTONE	-	-	857 326	2 957.623	37.873	2 995.496
UPPER GASCOYNE	2.036	0.641	332	4.229	-	6.906
WESTONIA	-	-	724 648	1 663.252	-	1 663.252
WILUNA	-	-	599 029	2 347.112	482.228	2 829.340
YILGARN	-	0.507	2 650 079	5 076.312	31.830	5 108.649
OTHER	78.238	10.434	586 977	227.661	43.884	360.217
<b>TOTAL</b>	<b>277.056</b>	<b>15.037</b>	<b>30 425 669</b>	<b>87 816.817</b>	<b>2 436.869</b>	<b>90 545.779</b>

Figure 3

# WESTERN AUSTRALIAN GOLD PRODUCTION

1886-1988 (est.)

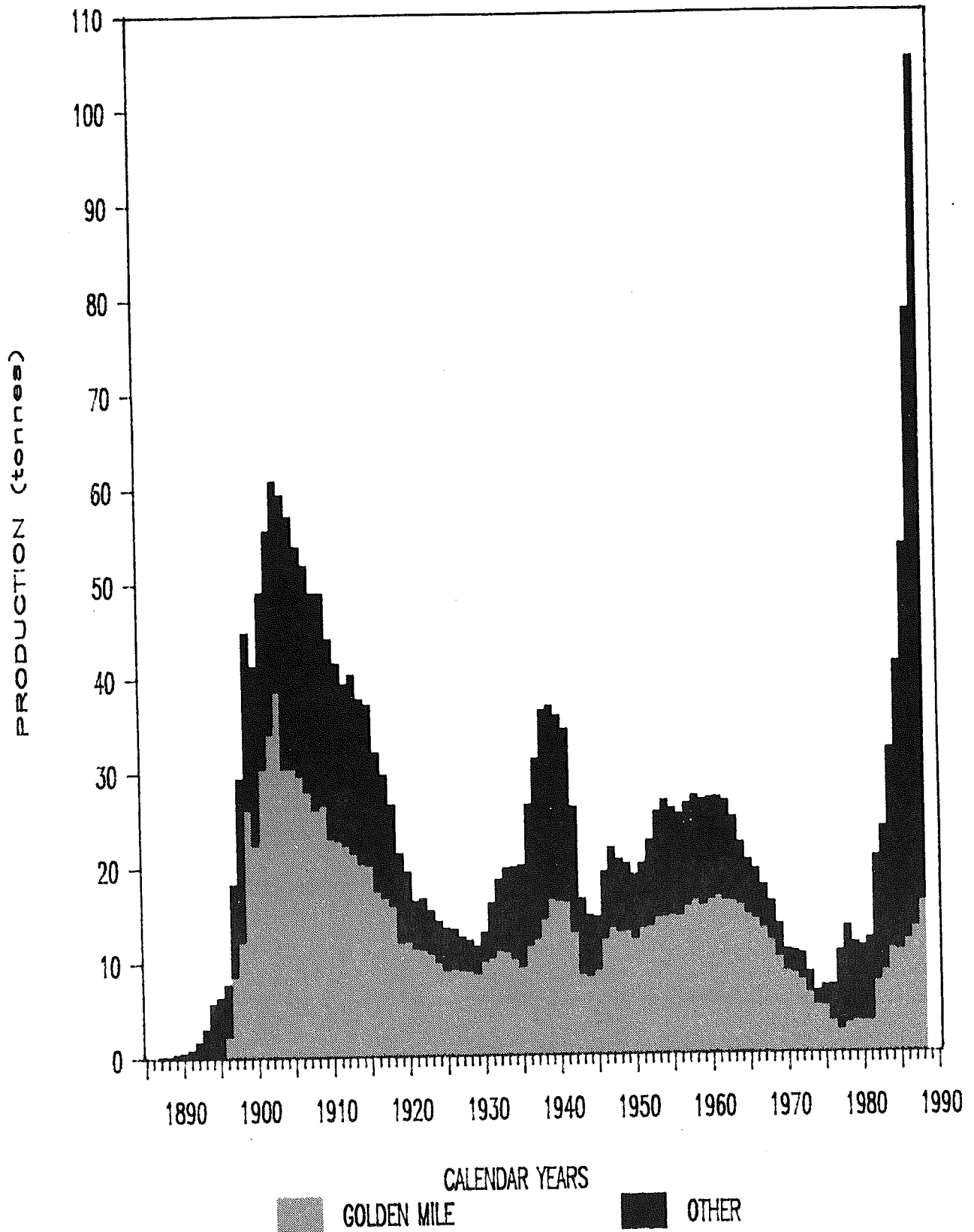


TABLE 6

## ROYALTY RECEIPTS 1986/87, 1987/88

Mineral	1986/87 (\$A)	1987/88 (\$A)	Value (\$A) Variance	% up (% down)
Alumina	10 540 225	12 132 983	1 592 758	15
Building stone	823	298	(525)	(64)
Clay	153 343	331 800	178 457	116
Coal	1 353 229	1 520 155	166 926	12
Cobalt	56 373	24 772	(31 601)	(56)
Construction materials				
aggregate	19 797	60 578	40 781	206
gravel	10 088	534	(9 554)	(95)
rock	22 519	84 622	62 103	276
sand	250 568	110 506	(140 062)	(56)
sandstone	-	25	25	n.ap.
Copper	143 183	106 883	(36 300)	(25)
Diamond	13 109 395	12 221 752	(887 643)	(7)
Diatomite	173	34	(139)	(80)
Dolomite	18	-	(18)	(100)
Emerald	134	-	(134)	(100)
Feldspar	3 195	14 429	11 234	352
Garnet sand	19 230	32 261	13 031	68
Gold	111 974	122 814	10 840	10
Gypsum	83 998	31 677	(52 321)	(62)
Iron ore	92 780 315	94 807 770	2 027 455	2
Kyanite	5 841	8 347	2 506	43
Limestone	90 641	54 029	(36 612)	(40)
Mineral beach sands				
ilmenite	1 462 769	2 530 669	1 067 900	73
leucosene	137 980	89 155	(48 825)	(35)
monazite	252 178	320 669	68 491	27
rutile	1 038 150	2 366 266	1 328 116	128
xenotime	8 457	-	(8 457)	(100)
zircon	1 347 903	3 685 866	2 337 963	173
Nickel	4 315 281	3 760 762	(554 519)	(13)
Ochre	2 255	-	(2 255)	(100)
Palladium	24 567	21 227	(3 340)	(14)
Peat	2 740	1 672	(1 068)	(39)
Petroleum Products				
condensate	695 164(r)	1 284 015	588 851	85
crude oil	21 917 124	23 818 340	1 901 216	8
natural gas	4 801 877(r)	4 941 808	139 931	3
Platinum	24 567	21 227	(3 340)	(14)
Salt	747 615	876 877	129 261	17
Semi-precious stones				
amethyst	6 375	14 662	8 287	130
Silica sand	165 339	197 211	31 872	19
Silver	87 238	55 446	(31 792)	(36)
Spodumene	72 632	217 515	144 883	199
Talc	88 874	91 994	3 120	4
Tantalite	109 428	159 774	50 346	46
Tin	143 601	102 163	(41 438)	(29)
Vermiculite	804	2 402	1 598	199
Zinc Concentrate	78 427	-	(78 427)	(100)
Total value	156 286 407(r)	166 225 989	9 939 582	6

Note: (r) Revised from previous edition.



Figure 4

### 1982/83 ROYALTY RECEIPTS

TOTAL : \$ 102.5 MILLION

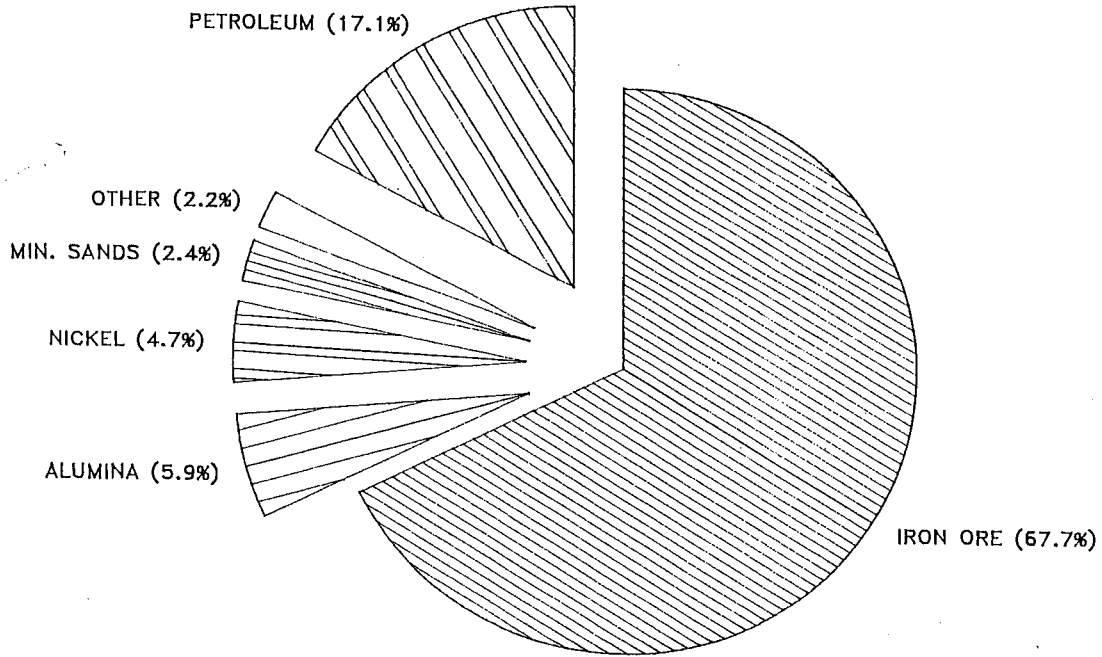


Figure 5

### 1987/88 ROYALTY RECEIPTS

TOTAL : \$ 166.2 MILLION

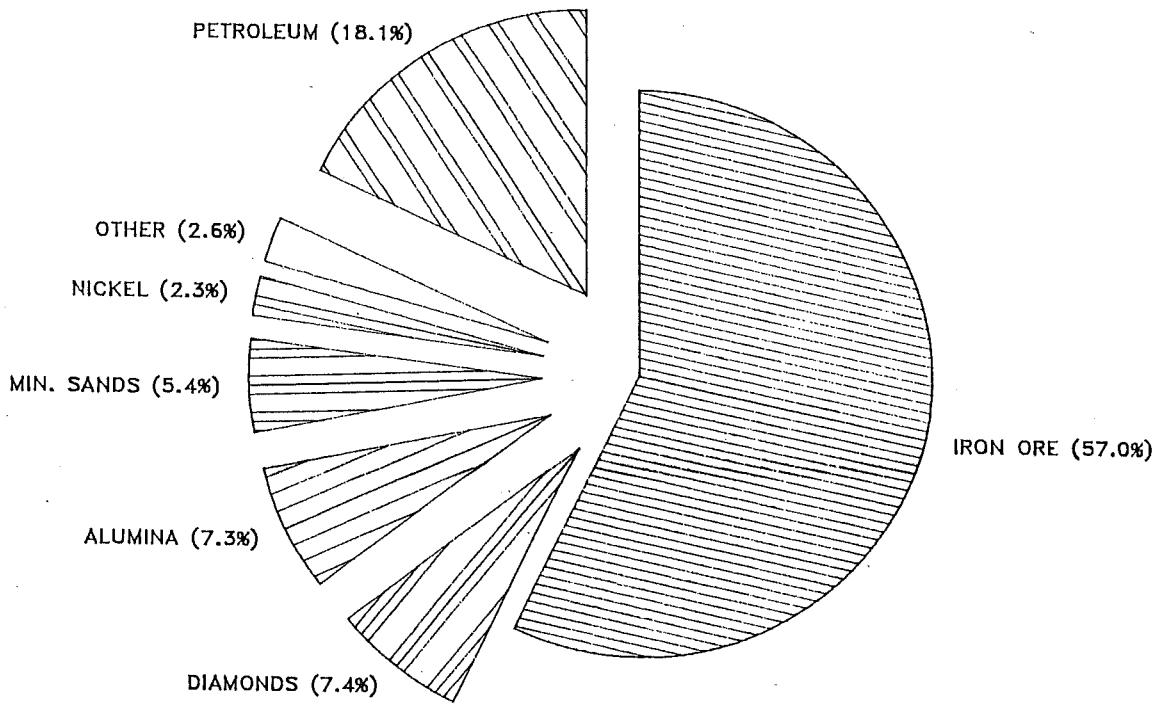


TABLE 7  
NUMBER OF PERSONS EMPLOYED IN THE WESTERN AUSTRALIAN MINING INDUSTRY  
AS AT JUNE 1988

(SOURCE: AXTAT REPORTING SYSTEM, MINING ENGINEERING DIVISION)

MINERAL COMPANY	LOCATION	1982(a)	1987/88
<b>ALUMINA</b>			
Alcoa of Australia Ltd.	Jarrahdale/Kwinana	1676	1574
	Del Park/Huntley/Pinjarra	1643	1683
	Wagerup	103	500
	Administration	210	283
Worsley Alumina Pty. Ltd.	Worsley	-	876
		<b>3632</b>	<b>4916</b>
<b>COAL</b>			
Griffin Coal Mining Co. Ltd.	Collie	421	493
Western Collieries Ltd.	Collie	648	712
		<b>1069</b>	<b>1205</b>
<b>COPPER-SILVER ZINC</b>			
Seltrust Mining Corporation Pty. Ltd.	Teutonic Bore	148	-
<b>DIAMOND</b>			
Argyle Diamond Mines J.V.	Lake Argyle	-	677
Freeport Bow River Properties Ltd.	Bow River	-	60
		-	<b>737</b>
<b>GOLD</b>			
AUR NL	Mt. Martin	-	45
Australian Consolidated Minerals Ltd.	Golden Crown	-	92
	Westonia	-	219
	Golden Kilometre	-	92
Australian Mine Mgmt. Pty. Ltd.	Norseman	-	51
Australis Mining NL	Cork Tree Well	-	40
Austwhim Resources NL	Mt Morgans	-	52
BHP Minerals Ltd.	Gimlet South/Orban J.V.	-	126
Bamboo Creek J.V.	Bamboo Creek	-	72
Bardoc Gold Pty. Ltd.	Bardoc	-	58
Barrack Mine Management	Horseshoe	-	119
	Willuna	-	95
Boddington Gold Project	Boddington	-	265
Broken Hill Metals	Hopes Hill	-	121
Brunswick NL	Galtee Moore	-	52
Callion Mining Pty Ltd	Callion	-	44
Central Norseman Gold Corp. NL	Norseman	373	469
Consolidated Exploration Ltd	Lady Bountiful	-	66
	Davyhurst	-	35
Chevron Exploration Corp.	Mt. Wilkinson	-	108
Cypress Minerals Aust. Co.	Gidgee	-	74
Eastmet Ltd.	Youanmi	-	98
Edjudina Gold Mines Pty. Ltd.	Neda/Gawler	-	95
Endeavour Resources Ltd.	Bluebird/Alladin	-	114
Forrest Gold Pty. Ltd.	Hannans South	-	21
	Tower Hill	-	55
Forsayth NL	Lawlers	-	82
	Mt Gibson	-	108
Freeport McMoran Australia Ltd.	Karonie	-	65
Gabanintha Gold Mines	Gabanintha	-	72
Golden Valley Mines NL	Fraser	-	51
Goongarrie Gold Mines	Goongarrie	-	65
Great Victoria Gold Ltd.	Gt Victoria	-	76
Hampton Australia Ltd.	Jubilee	-	97
Harbour Lights Mining Pty. Ltd.	Leonora	-	112
Hill 50 Gold Mine NL	Mt. Magnet	167	260
Hunter Resources Ltd.	Mertondale	-	30

MINERAL COMPANY	LOCATION	1982(a)	1987/88
KLV-Kalgoorlie	Mt Charlotte	184	343
KLV-Fimiston	Perseverance	531	523
Kia Ora Gold Corp. Ltd.	Marvel Lock	50	175
Kunanalling Joint Venture	Gibraltar	-	45
Kurara J.V.	Kurara	-	62
Metana Minerals	Reedy	-	78
	Mt Magnet	-	120
Mincoa NL	Edwards Find	-	94
Mt Percy Project	Mt Percy	-	71
Nevoria J.V.	Nevoria	-	70
Newmont Holdings Pty. Ltd.	New Celebration	-	131
Norgold Ltd	Bottle Creek	-	75
North Kalgurli Mines Ltd.	Fimiston	263	443
Norseman Gold Mines NL	Ravensthorpe	-	74
Pancontinental Gold Mining Areas Pty. Ltd.	Paddington	-	143
Peak Hill Resources	Peak Hill	-	51
Queen Margaret Gold Mines	Bellevue	-	203
Sons of Gwalla NL	Gwalla	-	87
Sundowner Minerals NL	Mt Fisher	-	71
Telfer Project	Telfer	111	482
WMC-GT. Boulder Holdings	Emu	-	128
	Kambalda	37	114
	Lancefield	75	100
	Sand King	10	53
Whim Creek Consolidated NL	Meekatharra	32	155
All Other Operators		1182	1257
<b>TOTAL GOLD</b>		<b>3027</b>	<b>8844</b>
<b>IRON ORE</b>			
BHP Minerals Pty. Ltd.	Koolyanobbing	77	-
	Kwinana	418	-
	Yamp1	558	459
Goldsworthy Mining Ltd.	Pilbara/Port Hedland	1178	892
Hamersley Iron Pty. Ltd.	Tom Price-Paraburdoo/Dampler	4041	2810
	Channar	-	25
Mt Newman Mining Co. Ltd.	Newman/Port Hedland	3794	3769
Robe River Mining Co. Pty. Ltd.	Pannawonica/Cape Lambert	1384	1166
		<b>11450</b>	<b>9121</b>
<b>MINERAL BEACH SAND</b>			
Allied Eneabba Pty. Ltd.	Eneabba	204	363
Associated Minerals Cons. Ltd.	Capel	122	177
	Eneabba/Narngulu	136	284
Cable Sands Pty. Ltd.	Capel	82	143
Westralian Sands Ltd.	Capel	139	388
		<b>683</b>	<b>1355</b>
<b>NICKEL</b>			
Agnew Mining Co. Pty. Ltd.	Leinster	288	20
Metals Exploration Ltd.	Nepean	175	-
Western Mining Corporation	Kalgoorlie	364	324
	Kambalda	1476	1618
	Kwinana Refinery	405	314
	Mt Windarra	348	530
		<b>3056</b>	<b>2806</b>
<b>PETROLEUM PRODUCTS</b>			
Bond Corporation Pty. Ltd.	Harriet	-	79
Home Energy Pty. Ltd.	Bliana/Sundown	-	4

MINERAL COMPANY	LOCATION	1982(a)	1987/88
Barrack Energy Ltd.	Mt Horner	-	3
Strata Oil NL	Woodada	45	4
West Australian Petroleum Pty. Ltd.	Barrow Island	133	183
	Dongara	9	11
Woodside Offshore Petroleum Pty. Ltd.	North Rankin A/Burrup Peninsula	-	1343
		187	1627
<b>SALT</b>			
Dampier Salt Ltd.	Dampier	173	174
	Lake McLeod	117	90
Leslie Salt Co.	Port Hedland	49	116
Shark Bay Salt J.V.	Shark Bay	98	101
		437	481
<b>ZINC CONCENTRATE</b>			
BHP Minerals Ltd	Cadjebut	-	99
<b>ALL OTHER MATERIALS</b> (Including Rock Quarries)			
		683	724
<b>TOTAL</b>		<b>24 372</b>	<b>31 915</b>

(a) 1982/83 Employment statistics not available.

PRINCIPAL MINERAL PRODUCERS 1987/88 - Head office postal address, telephone number: minesite.

#### ALUMINA

Alcoa of Australia (WA) Ltd, P O Box 252, Applecross 6153, (09) 364 0111: Del Park, Huntly, Jarrahdale, Willowdale.  
Worsley Alumina Pty Ltd, P O Box 344, Collie 6225, (097) 34 3022: Boddington.

#### BARYTES

Dresser Minerals Int. Inc, P O Box 441, Port Hedland 6721, (091) 732 377: North Pole.

#### BUILDING STONE - quartz

Matlock Mining N L, 1 Mill St, Perth 6000: Mukinbudin

#### CLAY - attapulgite

Mallina Holdings Ltd, 249 Stirling Highway, Claremont 6010, (09) 384 7077: Lake Nerramyne.

##### - cement clay

Bell Basic Industries Ltd, 136-138 Great Eastern Highway, South Guildford 6055, (09) 279 0000: Armadale.

##### - fire clay

Clackline Refractories Ltd, 45 Richardson St, West Perth WA 6005 (09) 322 7788: Plawanning.  
Midland Brick Company Ltd, Bassett Road, Middle Swan 6056, (09) 274 5522: Bullsbrook.

##### - kaolin

Greenbushes Tin Ltd, 91 Kensington St, East Perth 6000, (09) 325 8900: Greenbushes.

#### WHITE CLAY

Bristle Ltd, 212 Adelaide Tce, Perth 6000, (09) 325 7299: Jarrahdale.

#### COAL

Griffin Coal Mining Company Ltd, GPO Box 6474, Perth 6001, (09) 325 8155: Collie.  
Western Collieries Ltd, GPO Box X2231, Perth 6001, (09) 325 2711: Collie.

#### COBALT

Western Mining Corporation Ltd, 191 Great Eastern Highway, Belmont 6104, (09) 478 0711: Kambalda.

#### CONSTRUCTION MATERIALS - aggregate

Calsil Ltd, 5 Mill Street, Perth 6000, (09) 321 8552: Port Hedland.  
Woodhead JL, 407 Packsaddle Road, Kununurra 6743, (091) 81 1472 : Kununurra.  
The Readymix Group WA, 75 Canning Hwy, Victoria Park WA 6100, (09) 470 2222: Boodardie, Boulder, Karratha, Oscar Range.

##### - gravel

Ivanjah Pty Ltd, P O Box 159, Kalgoorlie WA 6430, (090) 21 3961: Grosmont.  
Kane DJ, 8 Oleander Place, Wickham 6720, (091) 87 1616 : Mt Welcome.  
Pioneer Concrete (WA) Pty Ltd, 123 Burswood Rd, Victoria Park 6100, (09) 362 1100: Port Hedland, Paraburdoo.

PRINCIPAL MINERAL PRODUCERS 1987/88 - continued.

CONSTRUCTION MATERIALS (ctd) - rock

Cockburn Cement Ltd, Russell Rd, South Coogee 6166, (09) 410 1533: Coogee.  
County, B S, C/- Specified Services, Unit 3/77 Hay St, Subiaco 6005, (09) 382 4488: Yeeda Station.  
Specified Services Pty Ltd, P O Box 89, West Perth 6005, (09) 321 3086: Mt Regal.

- sand

Amatek Ltd, 1 Newburn Rd, Kewdale 6104, (09) 353 3030: Gnangarra.  
Calsil Ltd, P O Box 7214, Cloisters Square, Perth 6000, (09) 321 8552: Port Hedland.  
Cockburn Cement Ltd, Russell Rd, South Coogee 6166, (09) 410 1533: Cockburn Sound.  
Cottlers Pty Ltd, P O Box 311, Port Hedland 6721, (09) 72 1553: Port Hedland.  
Drew, M, P O Box 55, Cervantes, 6511, (095) 45 7018: Cervantes.  
Hastie, J W, Lot 117 Coolgardie Rd, Kalgoorlie 6430, (090) 21 3961: Coolgardie.  
Marathon Roofing Pty Ltd, P O Box 5, Willetton 6155, (09) 455 1488: Jandakot.  
Specified Services Pty Ltd, Unit 3/77 Hay St, Subiaco 6008, (09) 382 4488: Maitland Stillman WJ,  
PO Box 71, Boulder WA 6432: Lake Lefroy.  
The Readymix Group (WA), 75 Canning Hwy, Victoria Park 6100, (09) 470 2222: Karratha, Lake  
Raeside, Rocklea, Turner River, Warramble Station, Warrawanda Creek, Widgiemooltha.  
Tomlinson JJ, 1 Bernard St, Claremont WA 6010, (09) 384 5553: Chidlow  
Wreford, WB, 75B Wellard Way, Karratha, WA 6714, (091) 85 3840: Karratha.

COPPER

Western Mining Corporation Ltd, 191 Great Eastern Hwy, Belmont 6104, (09) 478 0711: Kambalda.

DIAMOND

Argyle Diamond Mines Pty Ltd, 2 Kings Park Rd, West Perth 6005, (09) 482 1188: Argyle.  
- Ashton Mining Limited)  
AO (Aust) Pty Ltd ) 4th Floor, 441 St Kilda Rd, Melbourne Victoria 3004 (03) 267 5500.  
Tanaust Pty Ltd )  
Capricorn Diamond Pty Ltd, 2 Kings Park Rd, West Perth 6005, (09) 482 1188: Argyle.  
Westralian Diamond Trust, 28th Floor, Capita Centre, 197 St George's Tce, Perth 6000, (09) 322 7933.  
Freeport Bow River Properties Ltd, 22nd Floor, 360 Collins Rd, Melbourne Victoria 3004, (03) 602 4811:  
Lissadell.  
Gem Exploration and Minerals Pty Ltd, 9th Floor, 220 St George's Tce, Perth 6000, (09) 322 1979:  
Lissadell.

DIATOMITE

Hines, Horton and Rule, C/- 141 Robinson Street, Gingin 6503, (095) 75 2261: Gabys Peak.

DOLOMITE

Green K&P, P O Box 31, Newdegate 6355, (098) 71 1547 : Lake Magenta.

FELDSPAR

Matlock Mining NL, 1 Mill Street, Perth WA 6000, : Mukinbudin.

GARNET SAND

Cable Sands P O Box 133, Bunbury 6230, (097) 21 4111 : Capel  
Target Minerals N L, P O Box 188, Geraldton 6530, (099) 23 3644: Port Gregory.

PRINCIPAL MINERAL PRODUCERS 1987/88 - continued

GOLD

Australian Consolidated Minerals Ltd, C/- GPO Box X2201, Perth WA 6001, (09) 325 7755: Golden Crown, Westonia.  
BHP Minerals, 240 Hay St, Kalgoorlie 6430, (090) 242 060: Gimlet South, Ora Banda Tailings, New Gimlet West.  
Boddington, P O Box 48, Boddington 6390, (098) 838 260: Boddington.  
Central Norseman Gold Corporation N L, P O Box 56, Norseman 6443, (090) 39 1101: Central Norseman.  
Consolidated Exploration Ltd, P O Box 86, Fimiston 6433, (090) 91 2660: Davyhurst, Lady Bountiful.  
East Murchison Mining Pty Ltd, GPO Box C130, Perth, (09) 4265500 : Gidgee.  
Forsyth NL & Reynolds Aust. Mines Pty Ltd, 1st Floor, 28 The Esplanade, Perth 6000, (09) 3227221: Mt. Gibson.  
Hill 50 Gold Mine N L, P O Box 83, Mt Magnet, WA 6638, (09) 634 104: Hill 50.  
Kalgoorlie Mining Associates, P O Box 105, Fimiston 6433, (090) 21 3411: Fimiston, Mt Charlotte.  
Kia Ora Gold Corporation NL, PO Box 78, Southern Cross WA 6426, (090) 401 030: Marvel Loch.  
Metana Minerals NL, P O Box 792, Cloverdale 6105 (09) 277 9944 : Creedy, Parkinson, St George, Paris.  
Mt Percy Gold Project, PO Box 489, Kalgoorlie 6430, (090) 218 276: Mt Percy.  
Newmont Holdings Pty Ltd, P O Box 231, Boulder 6432, (009) 198 200: New Celebration.  
North Kalgurli Mines Ltd, PMB 13, Kalgoorlie 6430, (090) 21 0600: North Kalgurli, Paringa.  
Pancontinental Goldmining Areas Pty Ltd, P O Box 1161, Kalgoorlie 6430, (090) 24 2000: Paddington.  
Sons of Gwalia Ltd, P O Box 669, West Perth 6005, (09) 481 1988: Sons of Gwalia.  
Western Mining Corporation Ltd, P O Box 80, Belmont 6104, (09) 478 0711: Emu, Gt Boulder, Kambalda, Lancefield, Sand King.  
Western Alluvials Pty Ltd, C/-Bardack Mine Management, 614 Newcastle St, Leederville 6107 (09) 328 8200: Wiluna Goldmine, Wiluna Dumps.  
Whim Creek Consolidated N L, P O Box 144, West Perth 6005, (09) 325 5855: Haveluck/Phar Lap.

GYPSUM

Endeavour Resources Pty Ltd, 15th Floor, R & I Tower, 108 St George's Tce, Perth, 6000 (09) 324 6350: Wyalkatchem.  
Brady H B and Company Pty Ltd, P O Box 42 Bayswater 6053, (09) 279 4422: Lake Brown.  
CSR Building Materials, 21 Sheffield Rd, Welshpool 6106, (09) 451 4444: Yellowdine.  
Eaton MB & AE, PO Box 146, Narembeen 6369, (090) 64 7316, Mt. Walker.  
Fitzgerald, EM & EJ, PO Box 392, Merredin 6495, (090) 41 1146: Hines Hill.  
Kidman, G, PO Box 69, Newdegate 6355, (098) 71 6044: Varley.  
Lake Hillman Mining PL, P O Box 46, Kalannie 6468, (09) 66 2045: Lake Hillman.  
McAndrew Mining, C/- Post Office Yelbeni 6487, : Yelbeni.  
Nixon P F and R S, P O Box 49, Kalannie 6468, (09) 662 045: Lake Hillman.  
Pustkuchen, JV & Enright, North Baandee via Dooklakine, 6411, (090) 44 4032: Hines Hill.  
Swan Portland Cement Ltd, Burswood Rd, Rivervale 6103, (09) 361 8822: Lake Hillman.

IRON ORE

BHP Utah Minerals Int. 123 Kewdale Rd, Kewdale 6105, (09) 353 3822: Cockatoo Island, Koolan Island.  
Goldsworthy Mining Ltd, 197 St George's Tce, Perth 6000, (09) 322 1788: Shay Gap.  
Hamersley Iron Pty Ltd, 197 St George's Tce, Perth 6000, (09) 327 2327: Mt Tom Price.  
Mt Newman Mining Company Pty Ltd, 200 St George's Tce, Perth 6000, (09) 320 4666: Newman.  
Robe River Iron Associates, 9th Floor, 12-14 St George's Tce, Perth 6000, (09) 421 4747: Pannawonica.

KYANITE

Allied Eneabba Pty Ltd, 45 Stirling Highway, Nedlands 6009, (09) 386 8611: Eneabba.

PRINCIPAL MINERAL PRODUCERS 1987/88 - continued

LIMESTONE

Aquarius Holdings Pty Ltd, Unit 3/104 Erindale Road, Balcatta, 6021, (09) 349 6009: Wanneroo.  
Endeavour Resources Ltd, 15th Floor, R & I Tower, 108 St George's Terrace, Perth 6000, (09) 324 6350: Dandaragan, Dongara.  
Bell Basic Industries Ltd, 136-8 Great Eastern Highway, Guildford 6055, (09) 279 0000: Wanneroo.  
Henderson Nominees Pty Ltd, 19 Rangeview Road, Landsdale 6065, (09) 342 9988: Moore River.  
Specified Services Pty Ltd, Unit 3/77 Hay St, West Perth 6005, (09) 382 4488: Cleaverville.  
Swan Portland Cement Ltd, P O Box 78, Rivervale 6103, (09) 361 8822: Wanneroo.  
Unimil Pty Ltd, 26 Tomlinson Rd, Welshpool 6102, (09) 362 1411: Lancelin.  
WA Limestone Co, 41 Spearwood Ave, Bibra Lake 6163, (09) 418 4440: Nowerup.

MINERAL BEACH SANDS

Allied Eneabba Ltd, 45 Stirling Highway, Nedlands 6009, (09) 389 1222: Eneabba.  
Associated Minerals Consolidated Ltd, 45 Stirling Highway, Nedlands 6009, (09) 389 1222: Capel, Eneabba.  
Cable Sands Pty Ltd, P O Box 133, Bunbury 6230, (097) 21 4111: Capel.  
Westralian Sands Pty Ltd, P O Box 96, Capel 6271, (097) 27 2002: Boyanup, North Capel, Yoganup.

NICKEL

Western Mining Corporation Ltd, 191 Great Eastern Highway, Belmont 6104, (09) 478 0711: Carninya Hill, Kambalda, Windarra.

PALLADIUM

Western Mining Corporation Ltd, 191 Great Eastern Hwy, Belmont 6104 (09) 478 0711: Kambalda.

PEAT

Magnet Industries, 665 Welshpool Rd, Wattle Grove 6107, (09) 453 6777: Manjimup.

PETROLEUM - condensate

Doral Resources NL, 31 Ventnor Ave, West Perth WA 6005, (09) 481 5866: Woodada.  
West Australian Petroleum Pty Ltd, 233 Adelaide Tce, Perth 6000, (09) 325 0181: Barrow Island, Dongara.  
Woodside Offshore Petroleum Pty Ltd, 1 Adelaide Tce, Perth 6000, (09) 224 4111: North Rankin.

- crude oil

Barrack Energy Ltd, 262 St George's Tce, Perth 6000, (09) 322 2288: Mt Horner  
Bond Corporation Pty Ltd, Griffin Centre, 28 The Esplanade, Perth 6000, (09) 322 7355: Harriet.  
Home Energy Company Ltd, 4th Fl, 233 Adelaide Tce, Perth 6000, (09) 325 1555: Blina.  
West Australian Petroleum Pty Ltd, 1 Adelaide Tce, Perth 6000, (09) 325 0181: Barrow Island, Dongara.  
Western Mining Corporation Ltd, 233 Adelaide Tce, Perth 6000, (09) 425 4444: Herald/Pepper.

- natural gas

Doral Resources NL, 31 Ventnor Ave, West Perth 6005, (09) 481 5866: Woodada.  
West Australian Petroleum Pty Ltd, 233 Adelaide Tce, Perth 6000, (09) 325 0181: Dongara.  
Woodside Offshore Petroleum Pty Ltd, GPO Box D188, Perth 6000, (09) 425 1211: North Rankin.



PRINCIPAL MINERAL PRODUCERS 1987/88 - continued

PLATINUM

Western Mining Corporation Ltd, 191 Great Eastern Highway, Belmont 6104, (09) 478 0711: Kambalda.

SALT

Dampier Salt Ltd, 177 St George's Tce, Perth 6000, (09) 327 2327: Dampier, Lake MacLeod.

Leslie Salt Company, 44 St George's Tce, Perth 6000, (09) 325 4888: Port Hedland.

Shark Bay Salt Joint Venture, 22 Mount St, Perth Perth 6000, (09) 322 4811: Shark Bay.

SEMI-PRECIOUS STONES - amethyst

Soklich Trading Company, Lot 326 Dale Place, Orange Grove 6109 (09) 459 1449: Gascoyne.

SILICA SAND

Amatek Limited, 1 Newburn Road, Kewdale 6104 (09) 353 3030: Jandakot.

Australian Glass Manufacturers Co, 35 Baille Road, Canning Vale 6155 (09) 455 1111: Lake Gnangara.

Bell Basic Industries Ltd, 136-138 Great Eastern Highway, Guildford 6055, (09) 279 0000: Jandakot.

The Readymix Group (WA), 75 Canning Hwy, Victoria Park 6100, (09) 470 2222: Jandakot.

Western Mining Corporation Ltd, 191 Great Eastern Highway, Belmont 6104, (09) 478 0711: Mt Burges.

SILVER

Western Mining Corporation Ltd, 191 Great Eastern Highway, Belmont 6104, (09) 478 0711: Kambalda.

SPODUMENE

Lithium Australia Ltd, 91 Kensington St, East Perth 6001, (09) 325 8900: Greenbushes.

TALC

Gwalla Minerals NL, 38 Parliament Place, West Perth 6005, (09) 481 0023: Mt Seabrook.

Western Mining Corporation Ltd, P O Box 116, Three Springs 6519, (099) 54 5047: Three Springs.

TANTALITE

Greenbushes Tin Ltd, 91 Kensington St, East Perth 6000, (09) 325 8900: Greenbushes.

TIN

Greenbushes Tin Ltd, 91 Kensington St East Perth 6000, (09) 325 8900: Greenbushes.

VERMICULITE

Vermiculite Industries Pty Ltd, 15 Spencer Street, Jandakot 6164: Young River.

ZINC

BHP Minerals Ltd, Level 8, Forrest Centre, 221 St George's Tce, Perth 6000, (09) 426 5800: Cadjebut.