Compilation of Uranium Production History and Uranium Deposit Data Across Australia

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Overview of this Document

Australia has been involved in the nuclear industry since its dawn in the dark days of World War 2. Prior to this, we had supplied radium to the Curies of France, but this was not on a large scale. The 1950's saw a frenzied rush of prospecting, leading to mines being established across the Northern Territory, principally at Rum Jungle and in the Upper South Alligator Valley, at Mary Kathleen in Queensland and at Radium Hill in South Australia. Some of this uranium was later tested in the nuclear weapons exploded and tested on our own soil at Maralinga and Emu Field in South Australia. Experimental and exploration scale mines proliferated across the country. The early 1960's saw the realisation by the superpowers that uranium was in reality quite abundant in supply, and therefore the expensive Australian-produced uranium was no longer necessary for weapons programs. Most mines closed almost as quickly as they arose out of nowhere. Only Rum Jungle continued under heavy Commonwealth government subsidy.

With the nuclear industry supposedly reinventing itself in the mid-1960's as a "peaceful" source of energy, exploration again hit frenzy pitch by 1970, and soon discoveries of massive and high grade deposits were found across Australia. These included the big four of Ranger, Koongarra, Jabiluka and Nabarlek in the Top End of the Northern Territory. Other deposits found across Australia included Beverley, Honeymoon, Yeelirrie, Manyingee, Oobagooma, Olympic Dam, as well as dozens of small calcrete deposits in central Western Australia. The large Kintyre deposit was discovered in 1985 by CRA (now Rio Tinto), apparently while searching for diamonds and base metals.

This compilation is the first comprehensive picture of the production history of old mines, current mines and the size and grade of the numerous uranium deposits. This helps in establishing the true involvement of Australia in the nuclear fuel cycle historically, as well as our eagerness to stay active in the world's most destructive and opposed industry.

There are many inconsistencies in the various published data for some sites (Rum Jungle being the most confusing in this regard). Such differences have not been fully reconciled herein, and only what appears to be the most appropriate data set is presented. For the grade and tonneage data, the author has not sought to distinguish between the different classes of resource estimates, such as "measured", "probable", "inferred", "estimated additional" and the like. The deposit data used is generally the "total reserve", and is the most likely size and grade applicable to mining and milling. If it is imperative to confirm the category of the resource estimate, see the listed reference for that deposit or contact the author through the SEA-US website (see references).

Summary :

- **Production Data** - known production history and data for a mine [(1)].
- **Export Data** - export data and values for Australia, including safeguards accounts.
- **Deposit Data** - estimated uranium resources at a particular deposit.

[(1)] data is sometimes quoted as ‘uranium ore concentrate’, which is ~99% U_3O_8, data has been adjusted where quoted.

Production Summary by June 30, 2003 :

		t Ore Milled	%U_3O_8	t U_3O_8	Tailings %U_3O_8	t Low Grade Ore & Waste Rock
1970s-Present	Olympic Dam	62,754,413	0.079%	30,736	0.030%	~8,430,000
	Ranger	25,458,600	~0.290%	71,714	0.033%	>91,497,000
	Nabarlek	597,957 [M] 157,000 [HL]	1.84% ~0.05%	10,955	0.036% ~0.02% ?	2,330,000
	Beverley [(ISL)]	153 ML [P] >12,527 ML	-	33.27 [P] 1,614	-	2.686 ML [P] » 48.39 ML
	Honeymoon [(ISL)]	??	-	>29.4 [P]	-	??
	Mary Kathleen	6,200,000	0.10%	4,801	~0.02%	17,571,000
	Trial Mines	Various		» 12		» 150,000
Sub-Total		**95,167,970 t**	**0.149%**	**119,573 t**	**0.030%**	**(~) 119,978,000 t**
1950s-60s	Moline	135,444	0.46%	716.0	0.070%	??
	Rockhole	13,155	1.11%	139.7	0.066%	??
	Mary Kathleen	2,710,483	0.156%	4,091.76	~0.005%	4,429,764
	Radium Hill / Port Pirie	975,090 ? ~152,400	0.119% ~0.7%	852.3	~0.02% ~0.10%	??
	Rum Jungle	1,496,641	0.35%	3,530	~0.086%	14,283,000
	Trial Mines [RJ]	9,224.9 [RJ]	0.92%	- [RJ]	- [RJ]	??
Sub-Total		**5,331,076 t**	**~0.22%**	**9,330 t**	**~0.032%**	**>18,712,764 t**
(1900s -30s)	Mt Painter	~933 t	~2.1%	~3 t ??	-	?? [194.01 mg ^{226}Ra]
	Radium Hill	~2,150 t	~1.4% ?	up to 7 t ?	-	?? [1,800 mg ^{226}Ra]
Sub-Total		**~3,083 t**	**1.6% ?**	**10 t ?**		**?? [1.99 g ^{226}Ra]**
Grand Total		**100,502,566 t**	**0.152%**	**128,912 t**	**0.030%**	**>138,690,000 t**

[M] ore milled; [HL] low grade ore heap leached; [P] pilot plant only. [(ISL)] ISL involves chemical solutions only and no physical extraction of ore. » is much greater than. [RJ] Ore milled at Rum Jungle ('RJ'), not included in sub-totals.

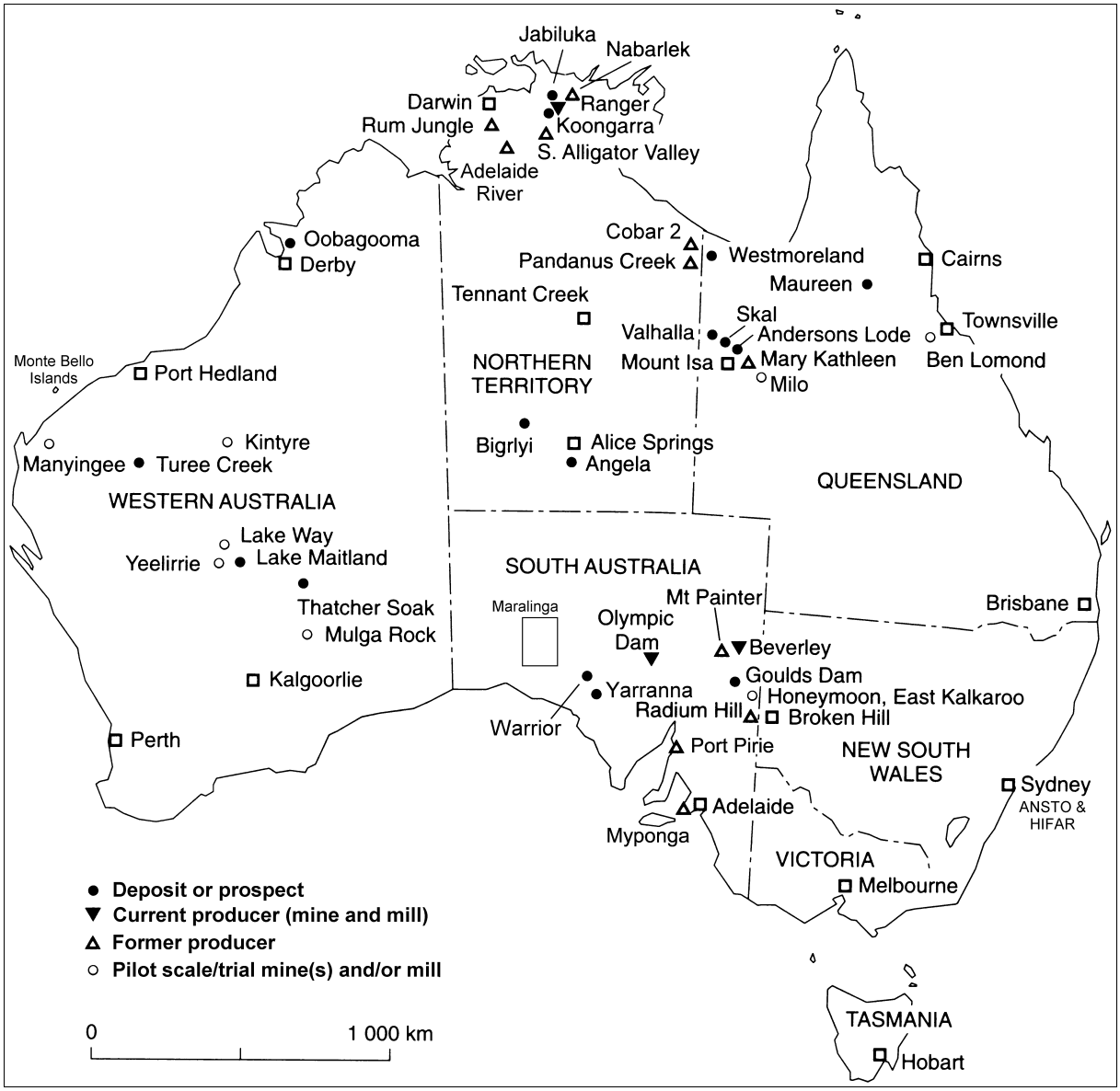
Exports Summary by December 31, 2002 :

		t U_3O_8	$million	$US/lb	$A/kg
1976-2002	NP	116,600	6,901	$10.46	$60.06

1950s-60s		t U_3O_8	£million	£/lb	$A/kg
Moline	NW	152.2 [RJ]	£0.806 [RJ]	£2.40 [RJ]	-
	NP	531.9	£5.0	£4.93	
Rockhole	NP	139.6	£1.15	£3.73	-
Mary Kathleen	NP	4,091.8	£39.7	£4.41	-
Radium Hill	NW	852.3	£17.5	£9.32	-
Rum Jungle	NW	1,438	£20.0	£6.31	-
	NP	~2,100 [(1)]	($?? million)	(??)	
Trial Mines [RJ]	NW	84.50	£0.383	£2.06	-
Sub Totals		**7,290.3**	**£84.539**	**£5.31**	**-**

[RJ] Production from ore trucked to Rum Jungle for processing or sold direct to the CDA. NW / NP - Nuclear weapons / power.
[(1)] Stockpiled uranium from 1963-1971, later sold by the government in the mid 1990s.

Map of Australian Uranium Deposits, Mines & Mills



Reference : Adapted from [1]

(Myponga, Cobar 2, Milo, Adelaide River, Warrior, Yarranna, Maralinga, Monte Bello Islands and ANSTO/HIFAR added by the author)

Queensland Uranium Production

Site	Ore	Grade	t U_3O_8	Year	Company	Ref's
Mary Kathleen	6.30 Mt 2.71 Mt	0.10% 0.156%	4,800.6 4,091.76[1]	76-82 58-63	Rio Tinto / AAEC Rio Tinto / Kathleen Inv's	[2] [3] [92]
Anderson's Lode	~10 t	~0. 2%		50's	Unknown	[114]
Milo [2]	9.27 t	0.77%	0.07	50's	Unknown	[4] [5]
Percyville [3]	10 t	2%	??	50's	Unknown	[5]
Flat Tyre [3, 4]	??	??	??	50's	Unknown	[79]
Ben Lomond [5]	3,500 t	0.21	>0.1 ?	79-81	Total Mining	[6] [3] [44] [109]

[1] About 9 t U_3O_8 of MKU uranium oxide was stored after 1963 for marketing and research purposes.
[2] This ore was trucked to Rum Jungle for treatment.
[3] Uranium ore formerly kept on site at the University of Queensland's Experimental Mine at Indooroopilly, Brisbane [79]. Percyville is also known as Limkins Prospect (eastern Queensland).
[4] Some ore was tested at the University of Queensland. No known production.
[5] The ore at Ben Lomond was extracted during construction of an underground access adit, through which further exploration of the orebody was completed. (Senate - Senate Hansard [6], December 2, 1986, page 2646). Apparently 32 t of ore was flown to Noumea and then to France for tests and processing [44].

Western Australian Uranium Production

Site	t Ore	Grade	t U_3O_8	Year	Company	Ref's
Kintyre [1]	~15.4	1.5-2.0%	~0.25 ?	97- 99 ?	Rio Tinto	[73] [74] [125]
Lake Way [2]	??	??	??	78 ??	Wyoming & Delhi Oil	[89]
Manyingee [3]	(ISL)	0.12%	0.47 (?)	85	Total Mining (France)	[6] [3] [121]
Mulga Rock [4]	??	??	??	83	PNC (Japan)	[3] [21] [80]
Yeelirrie [5]	>130,000	??	~11 ?	80-83 ?	Western Mining Corp.	[2] [3] [71] [95]

Notes : The exact quantity of uranium produced at the various trial mines in WA remains unclear.

[1] There were a small number of pilot scale ore crushing and pre-treatment facilities already at **Kintyre**, apparently now rehabilitated [74]. The pilot processing plant for **Kintyre** was built and operated at ANSTO's nuclear research laboratories in Sydney, NSW. It treated about 15 kg/hour of ore continuously over 42 days in 1997. Further trials have apparently since been undertaken, results unknown. The ore treated at ANSTO was upgraded at Kintyre using both gravimetric (or heavy media) separation as well as radiometric sorting to a concentrate grade of 1.5-2.0% U_3O_8, leading to about 75-100 t of ore being mined. Small shafts and exploration drives have been undertaken at Kintyre [74].
[2] The **Lake Way** site, until early 2000, was unknown as trial mine - it remains radioactively contaminated [89].
[3] For **Manyingee**, some say production was as high as 24 t U_3O_8.
[4] The trial costean/pit at **Mulga Rock** was 200x30 m in area and 30 m deep; some bulk ore samples were to be shipped to Japan, but were apparently refused export permits by the ALP government and reburied at the site - details remain secret.
[5] At **Yeelirrie** the exact uranium production figure is unknown, but could be much higher than the above figure if higher grade parts of the orebody were mined (expected).

South Australian Uranium Production

Site	t Ore	Grade	t U_3O_8	Year	Company	Ref's
Beverley (ISL)	153 ML [P] >9,279 ML	0.18%	33.27 [P] 1,614	1998 [P] 2001-??	Heathgate Resources	[6] [3] [2]
Bimbowrie	~0.6	5.55%	0.03	1950's ?	Unknown	[51]
Honeymoon	(ISL)	0.15%	29.4 ??	98-?? 82-83	Southern Cross Res. MIM / CSR / Teton	[6] [3]
Myponga	327.03 18.85	0.37% 0.22%	1.20 0.04	53-55	SA Government	[22]
Olympic Dam	62.7544 Mt	0.079%	30,736	88-??	WMC	[3] [2]
Radium Hill [1]	975,090 152,400	0.119% ~0.7%	852.3	54-62	SA Government	[3] [23]

Notes : See pages 20-23 for a detailed history of Olympic Dam production and page 13 for the available production data for Radium Hill / Port Pirie. ISL involves no ore extraction and only the pumping of large volumes of chemical solutions.
[P] Pilot milling only.

[1] Commercial scale uranium mining and milling only (see below for radium mining from 1906 to 1932). Ore was pre-treated at Radium Hill to produce a higher grade concentrate (the 0.8%) which was milled at Port Pirie. Approximately 300 lb (136 kg) of scandium oxide, valued at £49,557, was produced at Port Pirie over 1960-61. Further operations from 1971-75 produced rare earths, apparently focusing on scandium oxide, totalling about 1,604 t (?) valued at $185,686.

South Australian Radium Production

Year	Radium Hill	Mt Painter [(1)]	Value
1949		~0.45 t ore to USA	??
1934		18.0 mg Ra	£240
1932		72.0 mg Ra; 0.152 t '$NaUO_3$' [#]	£1,050
1927 Dec ½		45 mg Ra (£450);	
1927 June ½		0.187 t '$NaUO_3$' [#] (£118)	£1,088
1926	no Ra	52 mg Ra; 2.5 t ore conc DC - 18.3 t (0.75%), 3 t ore conc. (2.6-3.8%); MP - 2.17 t ore conc. (6.2%); 700 t ore at surface; no Ra	
1925	3 t ore concentrate; 7.01 mg Ra; 0.23 t '$NaUO_3$' [#]		£172.17
1918			£686
1915 June ½	215 t ore milled, 41 t ore concentrate		
1914 Dec. ½	406 t ore milled, 41 t ore concentrate	6.1 t ore 'high' grade	£5,215
1914 June ½	132 t ore milled >239 mg Ra	20.3 t @ 3.24%, 61 t @ ~1%, 3 t @ 0.8% & 0.8 t @ 5-20% to Europe	
1913 Full Yr	167 t mined @ 1.4%U_3O_8		£3,620
1913 June ½		127 t ore to England @ ~2.6%	
1912 Dec. ½	RH mill @ 10 t/week HH - 122 t smelted HH - 96.5 t treated RHN - 7.1 t ore mined 350 mg Ra	2.3 t ore 2.02% to Europe 7 t ore ~2% to Europe 0.5 t @ 25% (prior to 1913)	~£50 ??
1911 June ½	610 t ore at surface, 44 t ore to Bairnsdale, VIC	5.1 t ore to Europe	
1909 Dec. ½	31 t ore to Europe; ~3 t to USA		
Approximate Totals	>2,150 t ore milled, ~1,800 mg Ra, up to 7 t U_3O_8 by-product (?) Total Value ~£8,800	~933 t ore mined @ ~2.1%, 194.01 mg Ra (£2,338), ~3 t U_3O_8 (£213), Total Value ~£10,000	~£18,800

[(1)] During 1944, "small quantities" uranium ore were mined and supplied to the Manhattan Project - the project which produced the nuclear bombs dropped unncessarily on Hiroshima and Nagasaki in Japan. Exploration and pilot mining work continued until 1949 when the SA government abandoned all work to focus on Radium Hill.

Notes : RH/MP - Radium Hill/Mt Painter onsite mills; RHN - Radium Hill North mine; HH - Hunters Hill radium refinery, Woolwich, Sydney, NSW; DC - Dry Creek radium refinery, Adelaide, SA. Grades in %U_3O_8. [#] sodium uranate (~$Na_2U_2O_7$).

References : [3], [107], [111], [116] & [127].

Northern Territory Uranium Production

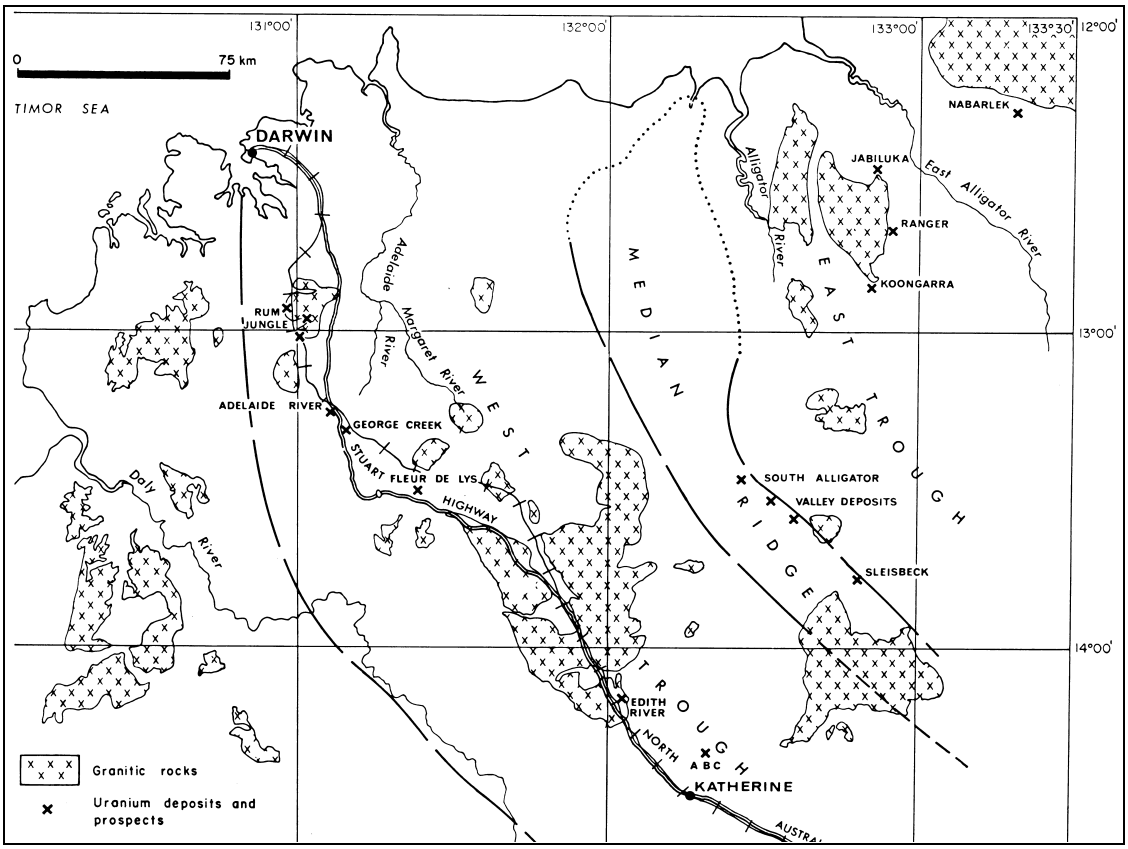
Site			t Ore	Grade	t U_3O_8	Year	Company	Ref's
Cobar 2 [#]			72.72	10.52%	7.65	56-57	North Aust. Uran. Corp.	[7] [8] [5]
Pandanus Creek [1]			3,353 329.37[#]	1.8% 8.10%	- 26.68	60-61	Sth Alligator Uran. NL / Aberfoyle Tin NL	[9] [10] [11]
Rum Jungle [2]	White's	Cu-U	301,000	0.33% U[$] 3.0% Cu	993	53-58	Territory Enterprises Pty Ltd (CRA subsidiary)	[12] [13] [14] [15]
		Cu-Co	295,000	2.8% Cu 0.3% Co	- -	53-58	Territory Enterprises	[12] [13] [15]
		Pb-Cu-Co	87,000	5.1% Pb 0.8% Cu 0.3% Co	- - -	53-58	Territory Enterprises	[12] [13] [14] [15]
	Dysons		157,000	0.34%	534	53-58	Territory Enterprises	[12] [13]
	Rum Jungle Creek South		653,000	0.41%	2,677	61-63	Territory Enterprises	[12] [4]
	Mt Burton		6,100	0.21% U[$] 1.06% Cu	12.8	1958	Territory Enterprises	[2] [12] [14]
Fleur de Lys [#]			119	0.12%	0.24	54-55	Brocks Creek Uran. NL	[8] [16] [11]
Brock's Creek [#]			118.8 62.7	0.12% 0.09%	0.20	55	Brocks Creek Uran. NL	[5]
George Creek [#]			103.4	0.22%	0.23	60	Brocks Creek Uran. NL	[5] [16]
Adelaide River [#]			3,085.2	0.50%	15.43	54-56	Aust. Uranium Corp. NL	[8] [16] [11]
South Alligator	El Sherana		4,687 [4,#] 39,054	0.68% 0.55%	31.87 214.8	56-58 58-59	United Uranium NL	[5] [17] [11]
	El Sherana West		21,658	0.82%	177.6	61-64	United Uranium NL	[17] [11]
	Rockhole [3]		13,155	1.11%	139.7	59-62	Sth Alligator Uran. NL	[11] [18]
	Palette		4,850	2.46%	119.3	56-57	United Uranium NL	[17] [11]
	Saddle Ridge		30,341	0.24%	72.8	60	United Uranium NL	[17] [11]
	Coronation Hill		26,124	0.26%	67.9	61-62	United Uranium NL	[17] [11]
	Scinto V		5,805	0.37%	21.5	58-64	United Uranium NL	[17] [11]
	Koolpin Creek		2,327	0.13%	3.0	58-64	United Uranium NL	[17] [11]
	Skull		531	0.55%	2.9	58-64	United Uranium NL	[17] [11]
	Sleisbeck [#]		637.08	0.34%	2.17	56	North Aust. Uran. Corp.	[5] [11] [76]
	Scinto VI		1,760	0.155%	2.7	58-??	United Uranium NL	[17] [11]
Nabarlek			597,957 157,000	1.84% ~0.05%	10,955	79-88	Queensland Mines Ltd	[2] [19] [20]
Ranger [5]			25.459	0.290%	71,714	81-??	Energy Res. of Aust. Ltd	[3] [2]

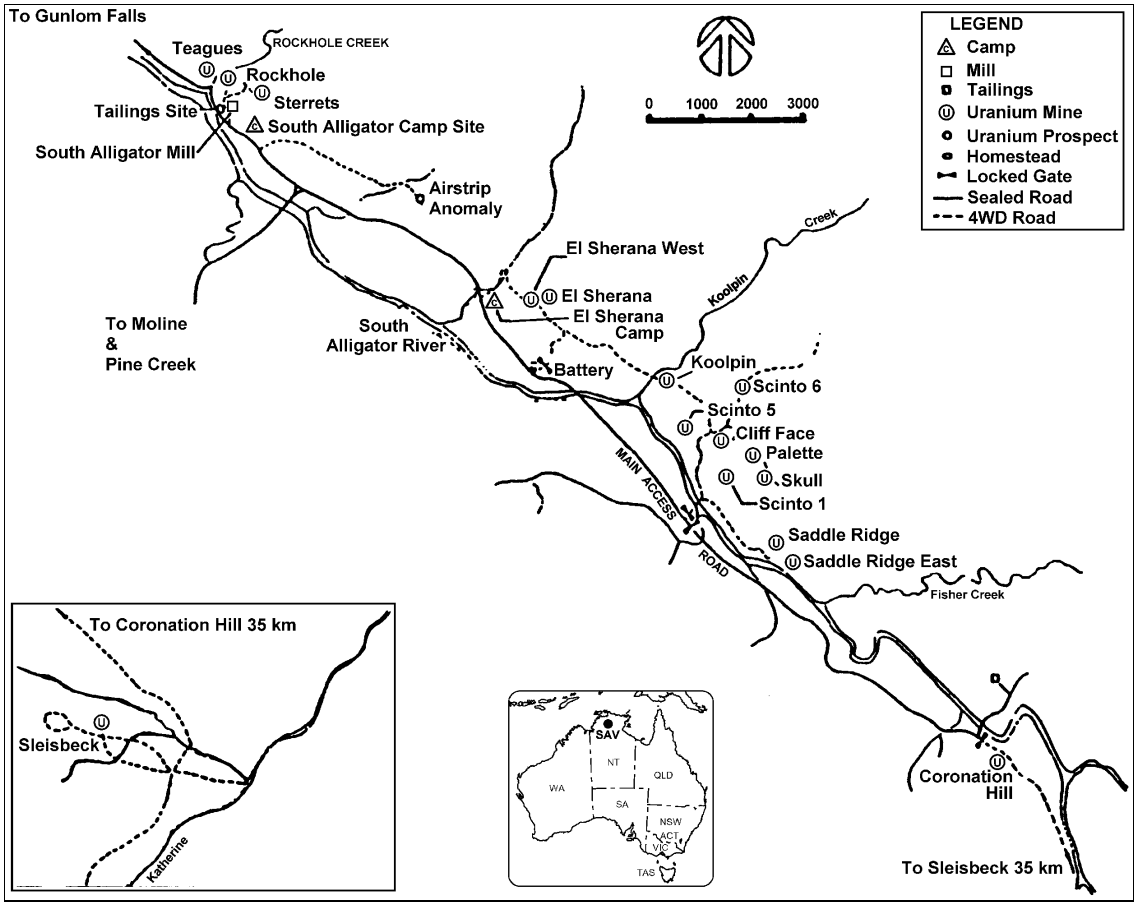
Notes :

[1] The ore extracted from Pandanus Creek was ~3,353 t, hand sorted down to ~329 t before transport to Rum Jungle for processing.
[2] The data for the Rum Jungle mine and mill is often conflicting, especially White's and the adjacent base metal deposits. The Pb ore from White's was not processed and was buried during rehabilitation works. At Mt Burton, a further 1,400 t of 2.66% Cu ore was extracted. A total of 726,000 t of Cu ore from the Intermediate deposit also mined and treated [12]. [$] uranium as uranium oxide (U_3O_8).
[3] Includes Teagues, O'Dwyers and Sterritts.
[4] After purchase of the Moline plant, United processed all South Alligator derived ore themselves.
[#] Ore sold to the AAEC and treated at Rum Jungle.
[5] Ranger production to March 31, 2002.
(See the following detailed history pages for uranium production at Ranger and Nabarlek).

Special Note : Most of the above U_3O_8 figures are totals based on ore and grade only and do not account for losses during the milling and recovery process, although some figures are actual production data (eg. Nabarlek and Ranger). There is confusion with some data due to imperial and metric units and inaccurate mine data.

NT Map of Uranium Projects & South Alligator Valley





References : top [16] & bottom [24]

1950's-60's U-Cu Milling at Rum Jungle

Fin. Year	Rum Jungle Ore Milled				Purchased U Ores		Production		Tailings		
	t U ore	$\%U_3O_8$	t Cu ore	%Cu	t U ore	$\%U_3O_8$	t U_3O_8	t Cu	kt	t U_3O_8	t Cu
68-69	109,000	??	-	??	-	-	246.4	494.5	108	1.18	-
67-68	91,000	??	-	??	-	-	257.0	577.3	91	1.08	-
66-67	79,000	??	103,000	??	-	-	249.9	2,190	180	1.04	750
65-66	79,000	??	144,000	??	-	-	274.7	2,862	220	1.18	820
64-65	74,000	??	121,000	??	-	-	259.4	2,161	196	0.95	800
63-64	73,570	0.37%	-	-	-	-	257.7	-	73	1.00	-
62-63	73,263	0.41%	10,330	2.77%	-	-	250.2	539	83	2.6	170
61-62[1]	79,976	0.35%	91,678	2.2%	244.77	8.22%	246.2	1,553	170	4.4	470
60-61[1]	74,456	0.28%	96,593	2.2%	96.01	9.18%	174.8	3,099	168	3.2	990
59-60	76,863	0.23%	66,830	2.6%	18.29	3.42%	145.8	2,729	141	2.1	380
58-59	74,660	0.23%	25,881	2.3%	1,294.4	0.97%	149.9	1,820	100	2.1	490
57-58	72,036	0.31%	-	2.6%	4,170.9	0.65%	198.1	1,409	75	3.1	490
56-57	72,778	0.41%	-	2.5%	2,374.5	0.38%	241.8	1,429	74	6.0	400
55-56	51,534	0.38%	2,856	2.7%	1,413.3	0.76%	148.9	668.6	55	4.6	790
54-55	22,489	0.23%	444	2.2%	418.1	0.40%	27.8	89.4	23	2.2	480
Total	1,103,625		662,604		10,030.3	0.90%	3,129	21,621[2]	1,757	36.74	7,030

Note : There is an error in [66], as it states uranium production as t U_3O_8, when in fact it is t U quoted (based on comparison to data from [81] & [82]). The total production is widely quoted as 3,530 t U_3O_8. Some uncertainty derives from the degree of losses during milling. Based on the residual uranium left in the tailings, it appears that efficiency improved over time.

[1] A small quantity of silver and gold was recorded in copper concentrates totalling 40,243 fine oz Ag plus 107.1 fine oz Au. A further 23,845 foz of silver was reported in 1961-61.
[2] Based on [113], the total value of copper production appears to be about $25 million.

Compiled from [66], [82], [94] & [100].

1950's-60's U-Cu Mining at Rum Jungle

	White's	**Dyson's**	**Mt Burton**	**Rum Jungle Creek South**	**Mt Fitch [1]**
Years	53-Nov. 58	57- Nov. 58	Oct/Nov 58	Apr 61-Aug 63	68-69
Open Cuts	3,560,000 m^3 ~11 ha	917,000 m^3 ~3.2 ha	101,000 m^3 -	2,220,000 m^3 ~11 ha	-
Ore	396,102 t [2]	156,000 t	6,100 t	660,000 t	-
$\%U_3O_8$	0.27%	0.341%	0.21%	0.43%	0.042%
t U_3O_8	1,069 t	532 t	12.8 t	2,838 t	-
Other	2.7% Cu	-	1.04% Cu	-	0.6% Cu
Low Grade Ore	??	47,800 t at 0.077% U_3O_8 (36.8 t U_3O_8)	3,500 t at 0.072% U_3O_8 0.69% Cu	116,000 t [3] at 0.066% U_3O_8 (76.6 t U_3O_8)	??
Waste Rock	~4,170,000 m^3 [4] ~8,950,000 t [4] ~0.004% U_3O_8 30.4 ha [4]	1,150,000 m^3 2,032,000 t ?? 8.43 ha	100,000 m^3 254,000 t ?? 3.28 ha	1,950,000 m^3 4,877,000 t ~0.018% U_3O_8 21.9 ha	8,000 m^3 ~20,000 t ?? ??

[1] Mt Fitch had overburden excavated but was not mined.
[2] Including 102 t of 0.178% U_3O_8 ore from White's Extended, mined 1958.
[3] Trucked to Rum Jungle for milling 1969 to 1971.
[4] Average estimate only (reliable figures are not available), data for White's is based on estimates of overburden to ore ratios, alternative heap volumes and references below; includes former White's North heap (removed during rehabilitation).

Reference : [102].

1950's-60's Purchased U Ores Treated at Rum Jungle

Mine	Comp.	Year	Type	t Ore	%U_3O_8	t U_3O_8	Value
Pandanus Creek, NT [1]	SAU	60-61	UG	329.36	8.10	26.68	£129,045
Cobar 2, NT [2]	NAUC	56-57	UG	72.72	10.52	7.65	£38,829
El Sherana, NT	UU	56-58	OC	4,687.29	0.68	31.87	£126,274
Sleisbeck, NT	NAUC	56	OC	637.08	0.34	2.17	£8,614
Adelaide River, NT	AUC	54-57	UG	3,085.24	0.50	15.43	£78,837
Brocks Creek, NT	BCU	late 50s	UG	118.8 62.7	0.12 0.09	0.14 0.06	£316
George Creek, NT	BCU	60	UG	103.4	0.22	0.23	£857
Fleur de Lys, NT	BCU	54-55	UG	119	0.2	0.20	??
Milo, QLD	???	late 50s	??	9.27	0.77	0.07	£280
			Total	9,224.86	~ 0.92	84.50	£383,052

Note - £ not adjusted for inflationary effects. Average price £2.06 / lb U_3O_8. NAUC - North Australian Uranium Corporation NL; AUC - Australian Uranium Corporation NL, BCU - Brocks Creek Uranium NL. The total uranium ore listed above is about 805 t less than that purchased according to the first table above, suggesting additional ore not accounted for above (see [102]).

[1] Hand-sorted ore delivered for 1960-61 was 25.4 t @ 18.20% U_3O_8, Mining was completed in December 1961, with hand-sorted ore for 1961-62 (ie. 1961) totalling 193 t @ 7.25% U_3O_8 [113]. However, the data in [113] appears to be incomplete.
[2] Hand-sorted ore for 1960-61 was 29.5 t @ 8.43% U_3O_8, No data for 1961-62 and [113] appears incomplete.

Reference : [102].

1950's-60's Base Metal (Pb-Cu) Mining at Rum Jungle

	White's		Intermediate Copper Mine [1]			Mt Burton
	Copper	Lead [2]	Mill	Sulfide [3]	Oxide [3]	Copper
Years	53-58	53-58	64-65	64-65	64-65	58
Ore	295,000 t	87,000 t	358,000 t	305,000 t	244,000 t	1,400 t
Cu	2.8%	2.7%	2.7%	1.7%	2.0%	2.66%
Other	0.3% Co	5.1% Pb, 0.3% Co	-	-	-	-
Waste Rock	??	??	645,000 m^3 over 6.85 ha 1,727,000 t at 0.005% U_3O_8, 0.2% Cu & 0.5% Pb			??

[1] Mining of copper ore in 1964 was 283,126 t, with 1965 mining 422,791 t.
[2] Not processed. [3] The sulfide and oxide ore was heap leached from 1966 (with little success).

Reference : [102].

1950's-60's Cu Production at Rum Jungle (t Cu)

Cal. Year	Co.	Flotation Copper	Cementation Copper	Total Cu
1958	TEP			
1959	TEP	1,704	855	2,559
1960	TEP	??	??	2,549
1961	TEP			3,069
1962	TEP			744
1963	TEP			147
1964	TEP			819

Cal. Year	Co.	Flotation Copper	Cementation Copper	Total Cu
1965	AMS	2,841	68	2,909
1966	AMS	2,387	519	2,906
1967	AMS	716 (??)	417	716
1968	AMS	0	189	
1969	AMS	0	140	
1970	AMS	0	86.6	
1971	AMS	0	8	

Reference : [88].

Rockhole & Moline Milling & Production Data

(Upper South Alligator Valley)

Fin./Cal. Year	Moline [1]				Rockhole [2]		
	t Milled	%U_3O_8	t U_3O_8	Other Production	t Milled	%U_3O_8	t U_3O_8
1973 [C]	(Mt Diamond - 1,335 t)			217 t Cu conc. (59 t Cu, 2,821 foz Ag)	-	-	-
1972 [C]	(Mt Diamond - 26,894 t)			4,909 t Cu conc. (1,321 t Cu, 62,867 foz Ag, 26.0 t Bi)	-	-	-
1971 [C]	(Mt Diamond Cu-Au - 19,677 t)			3,218 t Cu conc. (924 t Cu, 44,946 foz Ag, 13.64 t Bi)	-	-	-
1970 [C]	(Mt Evelyn - 9,328 t)			920 / 949 t Pb / Zn conc.	-	-	-
1969 [C]	(Mt Evelyn - 23,754 t, 5.4% Pb, 7.4% Zn, 9.2 foz/t Ag)			2,029 / 2,962 t Pb / Zn conc.	-	-	-
1968 [C]	(Mt Evelyn - 26,422 t, 4.9% Pb, 7.5% Zn, 9.2 foz/t Ag)			1,959 t Pb conc.	-	-	-
1967 [C]	(Mt Evelyn - 23,222 t)			2,456 / 4,114 t Pb / Zn conc.	-	-	-
1966 [C]	(re-opened Mt Evelyn Ag-Pb-Zn mine)			(no production)	-	-	-
1965 [C, 3]	(Retreatment of U tails for gold)			5,766 foz Au	-	-	-
1964 [C]	11,804	0.558%	63.2	2,529 foz Au	-	-	-
1963 [C]	15,324	0.691%	-	-	-	-	-
1962 [C]	25,867	0.39%	-	1,753 foz Au	-	-	-
1961 [C]	25,751	0.396%	-	759 foz Au	-	-	-
1960 [C]	40,551	-	-	-	-	-	-
1959 [C]	18,288	-	-	-	-	-	-
1956 [C]	~1,205 [4]	65% [4]	33 [4]	-	-	-	-
68-69 [F]	(Mt Evelyn - 24,138 t)			1,878 t Pb, 1,647 t Zn, 201,979 foz Ag	-	-	-
67-68 [F]	(Mt Evelyn - 25,761 t)			1,515 t Pb, 1,108 t Zn, 237,250 foz Ag, 243 foz Au	-	-	-
66-67 [F]	(Mt Evelyn - 9,678 t)			597 t Pb, 702 t Zn, 73,871 foz Ag	-	-	-
65-66 [F]	(Retreatment of U tails for gold)			1,710.8 foz Au, 86 foz Ag	-	-	-
64-65 [F, 1]	1,888.8	0.83% [5]	13.38	6,577 foz Au, 162.2 foz Ag	-	-	-
63-64 [F]	17,102	0.64% [5]	93.29	362.77 foz Au, 3.0 foz Ag	-	-	-
62-63 [F]	18,720	0.62% [5]	99.49	1,175.1 foz Au, 24.1 foz Ag	1,621	1.32% [5]	20.49
61-62 [F]	23,343	0.41% [5]	81.79	871 foz Au	2,851	1.46% [5]	39.74
60-61 [F]	33,914	0.36% [5]	104.73	836.5 foz Au	4,318	0.94% [5]	38.81
59-60 [F]	38,335	0.31% [5]	139.2	606 foz Au	4,628	0.97% [5]	40.66
Totals (U Ores)	133,303 [F] 137,585 [C]	~0.45%	~716 t	>12,400 foz Au	13,418	~1.11%	139.7 t
Base Metals (1966-73)	81,280 t Ag-Pb-Zn ore, 20,320 t Au ore & 51,000 t Cu-Au ore			2,304 t Cu, >624,109 foz Ag, ~7,200 t Pb, ~8,860 t Zn, 39.6 t Bi	-	-	-

[1] Moline stopped milling uranium ore at the end of August 1964, switching to lead-zinc-silver, gold and copper ores (production totals listed, ~$2,800,000).
[2] Rockhole closed September 1962.
[3] Reprocessed uranium mill tailings only, finished October 1965 (value ~$399,292).
[4] This is the first of 4 shipments of pitchblende concentrate exported to the USA (total apparently contained ~100 t U_3O_8). The ore processed in 1956 to produce the concentrate was the 1,205 t.
[5] grades approximate only.

[F / C] Financial / Calendar year (based largely on [88] & [94] / [112], respectively). foz - fine ounces.

Compiled from [88], [94], [101], [112] & [113].

Radium Hill / Port Pirie Uranium Mining & Milling

Year	Radium Hill		Port Pirie		
	Ore Milled	Ore Conc.	Value	Year	Value
1961 Dec ½	85,344 t	??	£2,900,000	1961	£2,200,000
1960-61	176,755 t	27,065 m^3	£2,900,000	1960	£1,800,000
1959-60	149,347 t	~18,043 m^3	£2,600,000	1959	£1,700,000
1958-59	140,818 t	??	£2,611,339	1958	£1,750,000
1956-57	122,936 t	??	£4,250,000	1957	£1,800,000
1956 June ½	56,896 t	??		1956	£1,750,000
1955	??	??	£1,250,000	1955	£1,250,000
Totals	~975,090 t (0.119% U_3O_8)	?? m^3	~£17,800,000		~£17,800,000

Note : Radium Hill mine started commercial operation in April 1954, with the mill starting in November 1954. All operations ceased on December 22, 1961. Port Pirie commenced on August 15, 1955 and closed on February 23, 1962. Approximately £49,557 of scandium oxide was produced at Port Pirie over 1960-61. By June 1958, revenue totalled £8.5 million.

Reference : [88], [111] & [117].

Beverley & Honeymoon In Situ Leach Mining

		Beverley							Honeymoon
		Mining Solutions	Prod-uction	Liquid Wastes				GAB Water	Trial Mine [1]
	Year	ML	t U_3O_8	ML	U (mg/L)	U (t)	^{226}Ra [2]	ML	t U_3O_8
2003	June		322						
2003	March								
2002	Dec.	5,704.2 (total extracted)	440	22.8	177	4.04	520	10.9	
2002	Sept.			21.3	161	3.43	330	12.5	
2002	June		306	19.5	234	4.56	510	9.9	
2002	March			13.2	204.9	2.70	-	14.2	
2001	Dec.	~1,141 [3]	327	15.4	184	2.83	-	15.60	
2001	Sept.	~1,356 [3]		18.3	102	1.87	-	14.20	
2001	June	~1,052 [3]	219	14.2	71	1.01	-	17.50	
2001	March	~36 [3]		0.49	39	0.02	-	16.44	
2000	Dec.		0	0	-	-	-	3.92	9.8
1999									9.8
1998	Beverley Trial mine [4]	153	33.27	2.686	~272 [5]	~0.73 [5]	-		9.8
Total	**Mine**	**~9,432**	**1,647.3**	**127.9**	**166**	**21.19**	**~455 [2]**	**115.16**	**29.4 t**

[1] Honeymoon trial mine (pilot plant) operated from April 1998 to August 2000.
[2] ^{226}Ra in Bq/L (data only for June to December 2002 quarters).
[3] Mining solutions for 2001 are not published or known, estimate based on a bleed rate for liquid wastes of 1.35%, as per estimates in [30] and the 2002 Annual Environment Report. Estimate compares well with proposed annual mining solutions of 6,709 ML and uranium production rates (pp 4-38) [30]. (Note : The 1998 field leach trial used a bleed rate of 0.5%).
[4] Beverley trial mine (pilot plant) operated from January 2, 1998 to December 20, 1998.
[5] Based on limited trial mine data in the Draft EIS [30]. Although this was stated in the Supplementary EIS to be unrepresentative of commercial operations, the 2001 data shows the 272 mg/L figure to be quite accurate.

References : [30], [119] & [120].

Uranium Mining, Milling & Production at Mary Kathleen

Year	t U_3O_8	Value £	Profit £	Dividends £
1964[1]	0	??	1,028,000	1,705,000
1963	727.96	6,986,764	1,920,000	2,842,000
1962	907.30	8,758,477	3,482,000	2,415,000
1961	873.48	8,525,000	3,193,000	2,274,000
1960	669.42	6,509,718	2,013,000	1,279,000
1959	658.68	6,449,267	2,096,000	781,000
1958	254.92	2,566,818	709,000	-
Total	4,091.76	£39,796,044	£14,441,000	£11,296,000

Year	Value
1982	$66,684,000
1981	$67,300,000
1980	$67,274,686
1979	$63,299,392
1978	$36,974,798
1977	$24,321,905
1976	$8,600,000
Total	$334,454,781

1970s Quarterly Production - t U_3O_8

1982	Dec.	36[2]
	Sept.	318
	June	273.1
	March	232.3
1981	Dec.	232.7
	Sept.	196.9
	June (½)	395.1

1980	Dec.	220.3
	Sept.	246.1
	June	212
	March	156.1
1979	Dec.	233.7
	Sept.	235.2
	June	215.1
	March	148

1978	Dec.	199.4
	Sept.	138.8
	June	152.8
	March	116.4
1977	Dec.	132
	Sept.	106
	June (½)	182
1976	Dec. (½)	293
	June (½)	130

Compiled from [84], [88] and [92]. ½ - half year. [1] final shipment made in 1964, hence earnings in this year.
[2] mill closed late October 1982.

Mining Data (t)		U Ore	Waste Rock	Low-Grade Ore
Total	**1956-1982**	**9,200,000**	**22,000,000 (total)**	
1981	Full Year	839,426	1,291,426	619,174
1980	Full Year	960,000	2,440,000	280,000
1979	Full Year	3,500,000 (total ore-low grade ore-waste rock)		
Total	**1956-1963**	**2,480,847** [1]	**3,863,390**	**566,374**
1963	Full Year	406,060	331,612	69,751
1962	Full Year	521,452	513,921	96,876
1961	Full Year	469,452	656,187	85,301
1960	Full Year	396,038	923,971	66,672
1959	Full Year	424,580	794,610	95,890
1958	Full Year	210,311	290,115	19,752
1957	Full Year	43,952	319,571	130,481
1956	Year End	9,002	33,403	1,651

Year	Ore to Crusher (t)	%U_3O_8	Rejected by Sorter (t)	Milled (t)	%U_3O_8	t U_3O_8
1980				680,000		834.5
1979				779,000		832.0
1963	539,212	0.165%	142,546	396,666	0.216%	727.96
1962	561,607	0.182%	148,399	413,208	0.238%	907.30
1961	550,339	0.178%	114,386	435,953	0.218%	873.48
1960	434,202	0.171%	43,738	390,464	0.189%	669.43
1959	-	-	-	661,964	0.166%	658.68
1958	-	-	-	205,000	0.154%	254.92

Compiled from [88], [91], [92] and [106]. Note - there is a discrepancy between [91] and [106] for milling data (presumably due to radiometric sorting versus actual milling).
[1] average grade of 0.156% U_3O_8. [2] Total low grade ore rejected by radiometric sorter June 1960-October 1963.

Nabarlek Milling & Production Data

Fin. Year	Ore	Grade	Uranium Oxide		Mill Recovery	Residual U_3O_8
			Contained	Production		
	t	$\%U_3O_8$	t U_3O_8	t U_3O_8	%	t
1988-89	-	-	-	80.4 [##]	-	-
1987-88	60,190	~1.83%	-	1,151.2 [#]	-	-
1986-87	74,769	~1.80%	-	1,387.1 [#]	-	-
1985-86	79,512	1.720%	1,367.6	1,384.0 [#]	-	-
1984-85	80,374	1.673%	1,344.7	1,328.1	98.8%	16.6
1983-84	75,567	1.691%	1,277.8	1,274.1	99.7%	3.7
1982-83	76,248	1.626%	1,239.8	1,211.1	97.7%	28.7
1981-82	78,724	1.93%	1,519.4	1,479	97.3%	40.4
1980-81	72,573	2.35%	1,705.5	1,660	97.4%	45.5

Compiled from [104]. [#] includes some U_3O_8 from the heap leaching experiment.
[##] production entirely from heap leaching (see table below). Grades for 1986-88 are estimates only.

1988	June	578.1
1987	Dec.	572.9
	June	781.4
1986	Dec.	600.6
	June	801.7
1985	Dec.	582.3
	June	733.0
1984	Dec.	557
	June	844

1983	Dec.	441
	June	773
1982	Dec.	452
	June	806
1981	Dec.	753
	June	673
1980	Dec. Qtr	479
	Sept. Qtr	414
	June Month	113

Half-yearly as t U_3O_8. Compiled from [84] & [88].

Nabarlek Below Ore Grade - Heap Leaching

Year	Below Grade Ore Slimes Treated (t)	Ore Heap Leached (t)
1988-89	-	85,290 [*]
1987-88	3,191	38,487
1986-87	4,058	21,500
1985-86	3,844	-

Compiled from [104]. Heap leaching of below cut-off grade ore was first approved in 1984 (pp 63, OSS Annual Report 1984-85). The process involves using mill solutions on piles of low grade ore to leach out uranium. It apparently began in the Dry Season of 1985 and continued until late 1988. The exact treatment process for the 'slimes' is unclear. [*] Figures for 1988-89 assumed, based on 157,000 t of low grade ore stockpiled.

Ranger - Mine Production Data (Mt)

	Total Ore (Mt)	Average Grade (%U_3O_8)	Waste Rock (Mt)	Low Grade Ore (Mt)	Total Rock (Mt)
Pit #3	11.874	??	12.489	19.008	43.371
Pit #1	19.78	0.321	55.5[#]	4.5	79.78

[#] Includes some 'very low grade ore' between 0.02-0.05% U_3O_8. Pit #3 data to December 2001 (some low grade ore included in waste rock).

References : ERA Brochure for Pit #1, below for Pit #3. (note conflict with table below from ERA and OSS Annual Reports).

Fin. Year	Ore Mined			Cut Off %U_3O_8	Low Grade Ore		Waste Rock	Const. Material	Total Mined
	Pit	SP	Mill		(Mt)	t U_3O_8 [1]			
2002	3	0.629	0.201	0.12	0.195	137	2.624		4.483
2001 ½ [2]	3	1.207	0.166	0.12	1.483	1,038	1.001		3.857
00-01	3	1.539	0.259	0.12	3.392	2,374	2.443	-	7.633
99-00	3	2.053	0.305	0.12	2.867	2,007	1.657	-	6.882
98-99	3	1.974	0.522	0.12	4.158	2,911	1.185	-	7.839
97-98	3	2.210	0.100	0.12	4.141	2,899	1.730	-	8.181
96-97	3	0.709	-	0.12	2.772	1,940	1.849	-	5.330
95-96 [3]	1	0.00035	-	0.20	0.014	15	0.245	-	0.259
94-95	1	0.841	-	0.20	1.324	1,456	0.404	-	2.569
93-94	1	0.712	-	0.20	1.771	1,948	0.980	-	3.463
92-93	1	0.826	0.004	0.20	1.942	2,136	1.102	-	3.874
91-92	1	0.337	0.098	0.10	0.792	475	-	1.316	2.543
90-91	1	0.439	0.222	0.10	0.569	341	1.002	0.553	2.785
89-90	1	0.617	0.468	0.10	0.862	517	0.957	1.203	4.107
88-89	1	1.923	0.477	0.10	1.735	1,041	1.399	0.440	5.974
87-88	1	1.972	0.158	0.10	2.840	1,704	1.160	0.240	6.370
86-87	1	1.253	0.461	0.075	0.920	437	2.120	0.290	5.044
85-86	1	1.05	0.45	0.10	3.20	522	1.59	0.76	7.05
84-85	1	0.4034	0.500	0.10	1.269	761	1.8187	0.551	4.542
83-84	1	0.7799 (total)		0.10	0.711		427	0.632	3.097
82-83	1	0.3744 (total)		0.10	0.6		360	1.0	3.8
81-82	1	2.0853 (total)		0.10	-	-	1.786 [#]	-	3.9
80-81[4]		1.5467 (total)		0.10	-	-	5.0 [5]		6.547

Total	**3**	**11.874 Mt ore**		**19.008**	**13,306**	**12.489 Mt**	**43.371**
	1	**17.998 Mt ore**		**16.219**	**12,142**	**29.303 Mt**	**63.520**

[1] Assuming an average %U_3O_8 at half the cut off grade.
[2] December half-year data only.
[3] No mining was undertaken from late 1994 to mid 1997 due to the switch from Pit #1 to #3.
[4] Includes from the start of construction.
[5] Assuming 2 t/m^3.
[#] Includes low grade ore.

Notes : SP - Stockpiled ore; Low Grade Ore is that below the cutoff grade; Waste Rock is unmineralised material (less than 0.02% U_3O_8); Const. - Construction material.

Half-Yearly Mine Production Data

	Half-Year	Material Mined (Mt)				
		Ore	%U_3O_8	Low Grade Ore	Waste Rock	Total
2001	December	1.373	??	1.483	1.001	3.857
2001	June	0.7		-	3.1	3.8
2000	December	1.1	0.30%	-	2.7	3.8
2000	June	0.26		-	2.84	3.1
1999	December	2.1	0.27%	-	1.7	3.8

Notes : Waste Rock presumably includes Low Grade Ore (figures from ERA Dec. 2000 Half Yearly report and August 2001 Shareholder Update).

Ranger - Annual Uranium Milling & Production

Fin. Year	Ore	Grade	Uranium Oxide		Mill Recovery	Residual U_3O_8
			Contained	Production		
	Mt	%U_3O_8	t U_3O_8	t U_3O_8	%	t
2003	1.113	~0.27	~3,029	2,460	~89.3%	~175
2002	1.784	0.281	5,013.0	4,470	89.2%	543.0
2001 ½ [1,H]	0.665	0.312	2,076.3	1,952	94.0%	124.3
2000-01	1.840	0.283	5,277.9	4,606	87.4%	665.9
1999-00	1.468	0.299	4,390.8	4,144.0	94.4%	246.8
1998-99	1.827	0.267	4,879.5	4,375.0	89.7%	504.5
1997-98	1.843	0.269	4,796.1	4,162.0	83.9%	634.1
1996-97	1.571	0.311	4,880.8	4,236.9	86.7%	643.9
1995-96	1.201	0.349	4,191.5	3,453.3	82.4%	738.2
1994-95	0.578	0.345	1,994.1	1,548.2	77.6%	445.9
1993-94	0.437	0.389	1,699.9	1,461.8	86.0%	238.1
1992-93	0.426	0.348	1,482.5	1,335.1	90.1%	147.4
1991-92	0.986	0.324	3,194.6	2,980.0	93.3%	214.6
1990-91	1.090	0.295	3,215.5	2,908.3	90.4%	307.2
1989-90	1.089	0.314	3,419.5	3,084.0	90.2%	335.5
1988-89	0.975	0.408	3,978.0	3,595.5	90.4%	382.5
1987-88	0.782	0.423	3,307.9	3,041.5	91.9%	266.4
1986-87	0.869	0.379	3,293.5	3,123.8	94.8%	169.7
1985-86	0.968	0.350	3,388.0	3,067.0	90.5%	321.0
1984-85	1.021	0.317	3,236.6	3,037.0	93.8%	199.6
1983-84	1.003	0.343	3,440.3	3,098.7	90.1%	341.6
1982-83	1.044	0.318	3,319.9	3,000.0	90.4%	319.9
1981-82 [2]	0.859	0.308	2,645.7	2,322.5	87.8%	323.2
Total	**25.459**	**0.295**	**~80,065**	**71,714**	**89.6%**	**~8,351**

[1] Data for half-year [(H)] only ending December 31, 2001, ERA have now changed to calendar year reporting.
[2] 9 months to June 30 only.

Notes - Efficiency calculated as the percentage extracted over that contained. Residual is the amount of uranium left in the mill tailings (giving an average grade of about 0.033% U_3O_8).

Ranger - Quarterly Uranium Production & Sales

	3 Months To	Ore Milled		Uranium Oxide (U_3O_8)			t U_3O_8 Sales		Residual U_3O_8
				Contained	Production	Efficiency			
		kt	%U_3O_8	t	t	%	Ranger	Other	T
2003	June	619	~0.26 #	~1,635 ?	1,460	??	??	??	~175 ??
	March	514	~0.27 #	~1,394 ?	1,245	??	??	??	~149 ??
2002	Dec.	556	~0.29 #	~1,594 ?	1,419	??	??	??	~175 ??
	Sept.	464	~0.29 #	~1,335 ?	1,188	??	??	??	~147 ??
	June	399	~0.26 #	~1,049 ?	934	??	??	??	~115 ??
	March	365	~0.29 #	~1,044 ?	929	??	??	??	~115 ??
2001	Dec.	393	~0.30 #	~1,171	1,154	??	??	??	??
	Sept.	272	0.301	818.7	798	97.5%	-	-	20.7
	June	344	0.302	1,038.9	973	93.7%	-	-	65.9
	March	501	0.290	1,452.9	1,278	88.0%	-	-	174.9
2000	Dec.	498	0.296	1,474.1	1,232	83.6%	-	-	242.1
	Sept.	497	0.264	1,312.1	1,129	86.0%	-	-	183.1
	June	308	0.308	948.6	910.7	96.0%	-	3.0	37.6
	March	408.0	0.309	1,260.7	1,165.0	92.4%	-	-	95.7
1999	Dec.	422.0	0.297	1,253.3	1,159.0	92.5%	-	0	94.3
	Sept.	330.3	0.281	928.1	909.3	98.0%	-	0	18.8
	June	334.3	0.262	875.9	736.2	84.1%	-	0	139.7
	March	429.9	0.264	1,134.9	1,052.7	92.8%	-	0	82.2
1998	Dec.	494.0	0.277	1,368.4	1,191.0	87.0%	-	0	177.4
	Sept.	568.3	0.264	1,500.3	1,395.1	93.0%	-	0	105.2
	June	395.7	0.236	933.9	732.6	78.4%	-	-	201.3
	March	301.4	0.252	759.5	730.9	96.2%	-	-	28.6
1997	Dec.	617.0	0.268	1,653.6	1,454.4	88.0%	-	-	199.2
	Sept.	528.9	0.274	1,449.2	1,244.1	85.8%	508.4	-	205.1
	June	438.6	0.306	1,342.1	1,104.8	82.3%	1,704.3	798.0	237.3
	March	366.5	0.318	1,165.5	988.5	84.8%	883	157	177.0
1996	Dec.	380.1	0.318	1,208.7	1,100.3	91.0%	1,233	239	108.4
	Sept.	385.6	0.302	1,164.5	1,043.3	89.6%	136.1	269.8	121.2
	June	419.9	0.351	1,473.8	1,137.2	77.2%	1,948.6	172.4	336.6
	March	-	-	-	857.4	-	-	-	-
1995	Dec. H	-	-	-	1,458.7	-	1,252	418	-
1994	Dec. H	-	-	-	0.0	-	739	759	-
1993	Dec. H	-	-	-	0.0	-	703	755	-

ERA no longer report quarterly ore grade in milling data; estimates based on the limited available data.

Ranger - Emissions, Energy and Environmental Data

Year	Energy		CO_2		SO_2		Water		Land Dist.	Land Rehab	Total Dist.
	TJ	MJ/t	t	kg/t	t	kg/t	ML	kL/t	ha	Ha	Ha
2001	836	554	63,000	41.7	128	0.085	191	0.127	13	12	450
97-98	864	469	62,293	33.8	194	0.105	210	0.114	10.8	0	390.8
96-97	740	471	53,885	34.3	151	0.096	228	0.145	65	20	380
95-96	527	439	34,473	31.2	63.7	0.053	150	0.125	26	0	335

Abbreviations : CO_2 / SO_2 - carbon / sulfur dioxide Dist. - disturbed Rehab - rehabilitated

Units : TJ - Tera Joules (10^{12} J)
MJ/t - Mega Joules (10^6 J) per tonne (t) ore milled
kg/t - kilograms per tonne ore milled
ML - Mega Litres (10^6 L)
kL/t - kilolitres (10^3 L) per tonne ore milled
ha - hectares (10^4 m^2)

References : [122] [123] [124].

Quarterly & Half-Yearly Production - t U_3O_8

1995	Dec.	410.4
	Sept.	1,048.3
	June	843.1
	March	705.1
1994	Dec.	0.0
	Sept.	0.0
	June	912.4
	March	549.4
1993	Dec.	0.0
	Sept.	0.0
	June	700.5
	March	634.6
1992	Dec.	0.0
	Sept.	0.0
	June	686.4
	March	663.9

1991	Dec.	715.9
	Sept.	913.6
	June	827.6
	March	663.7
1990	Dec.	564.7
	Sept.	852.3
	June	872.8
	March	604.9
1989	Dec.	778.4
	Sept.	827.9
	June	976.1
	March	707.3
1988	Dec.	993.8
	Sept.	918.3
	June	588.3
	March	1,212.0

1987	Dec. [H]	1,241.2
	June [H]	1,020.3
1986	Dec. [H]	2,103.5
	June [H]	1,393.1
1985	Dec. [H]	1,673.9
	June [H]	845.2
1984	Dec. [H]	2,191.8
	June [H]	1,583.8
1983	Dec. [H]	1,514.9
	June [H]	1,065.7
1982	Dec. [H]	1,934.3
	June [H]	1,200.3
1981	Dec.	776.8
	Sept.	345.4

Sales - "Other" refers to uranium traded by ERA but not produced by Ranger. It is typically bought cheaply from Kazakhstan to fulfil contracts 'profitably' (no royalties are paid to Aboriginal people from externally sourced uranium). [H] Half year only.

References - [84] & [88].

Ranger - Annual Corporate Data

Financial Year	Produced t U_3O_8	Sales t U_3O_8			Revenue $million	Costs[1] $million	Profit[2] $million	Jobs
		Ranger	Foreign	Exports				
2003	2,705	??	??	??	??	??	??	??
2002	4,470	4,517	628	-	198.7		21.2	184
2001 ½ [3,H]	1,952	1,915	0	-	83.7	-	10.3	231
2000-01	4,612	3,998	408.2	-	149.1		26.2	-
1999-00	4,144.0	4,511	3.0	-	181.85	135.5	46.3	257
1998-99	4,375.0	4,006.0	0	-	172.93	127.1	43.15	272
1997-98	4,162.0	4,635.3	292.5	-	201.34	152.5	47.62	255
1996-97	4,236.9	3,956.3	1,464.3	-	230.56	156.8	71.57	246
1995-96	3,453.3	3,363.9	867.6	-	180.35	119.6	58.56	215
1994-95	1,548.2	2,012.8	1,418.4	-	140.03	102.0	35.42	198
1993-94	1,461.8	1,934.9	1,510.3	-	152.18	106.1	44.28	193
1992-93	1,335.1	2,250.3	848.0	-	159.51	84.5	72.53	198
1991-92	2,980.0	2,230.1	1,328.4	3,469.1	170.46	96.9	69.09	191
1990-91	2,908.3	2,598.5	802.3	2,648.3	210.41	108.4	101.60	339
1989-90	3,084.0	2,716.1	47.6	2,995.3	206.90	97.9	125.83	340
1988-89	3,595.5	2,633.4	0	3,869.0	177.52	86.9	80.63	354
1987-88	3,041.5	3,274.0	0	3,656.9	251.30	102.0	131.06	374
1986-87	3,123.8	3,048.0	0	2,796.9	234.26	-	108.09	414
1985-86	3,067.0	2,810.2	0	2,724.9	222.51	-	98.42	409
1984-85	3,037.0	2,682.0	0	2,755.6	233.80	-	109.85	421
1983-84	3,098.7	2,668.7	0	2,307.1	246.10	-	113.02	429
1982-83	3,000.0	3,152.2	0	2,857.2	261.20	-	113.36	404
1981-82	2,322.5	1,976.9	0	1,518.1	146.00	-	45.58	414
Total	**71,713.6**	**64,975.6**	**9,618.6**	**»31,598.4**	**4,210.71**	**-**	**1,573.7**	**-**

[1] Costs are ERA's "Net Expenses". [2] Profit before abnormal items and tax. Data not inflation adjusted.
[3] ERA switched to calendar year financial reporting in May 2001. Data for half-year [(H)] ending December 31, 2001.

About Ranger Tables

Compiled from ERA Annual & Quarterly Reports, [2], [25], [77], [78], [83] to [86].

Olympic Dam - Total Cu-U-Au-Ag Production

To June 30, 2001	Ore Milled t	Copper		Uranium	
		%Cu	t Cu	$\%U_3O_8$	t U_3O_8
Totals	**62,754,413**	**2.72%**	**1,452,303**	**0.079%**	**30,736**
Efficiency [1]	-	**85.0%**		**62.3%**	

To June 30, 2001	Silver		Gold	
	g/t	oz Ag	g/t	oz Au
Totals	**6.34**	**6,316,208**	**0.57**	**645,371**
Efficiency [1]	**47.6%** [2]		**54.0%** [2]	

Waste Rock (Mullock) [3]	~8,430,000 t

[1] Based on available grade and production data below.
[2] Silver and gold recovery is highly variable, but can be as high as 75%.
[3] Actual waste rock figures are (generally) not reported publicly by WMC. Based on annual mining rates of 9.5 Mt, waste rock production is about 0.75 Mt, a ratio 12.5:1 or ~8% (Email, Steve Green (WMC), February 13, 2002). Based on design estimates or pilot mining data, the ratio of ore hoisted to the surface to that of waste rock (mullock) was about 3:1 [105; 108]. Curiosly, the 1999 Environment Progress Report states some 2.058 Mt of waste rock produced at Olympic Dam (6.743 Mt ore milled). Most waste rock is used in the underground mine as backfill for mined out stopes.

Olympic Dam - Annual Cu-U-Au-Ag Production

Financial Year	Ore Milled t	Copper (Cu)		Uranium (U_3O_8)		Silver (Ag)		Gold (Au)	
		%	t	%	t	g/t	oz	g/t	Oz
2003	4,276,467	2.36	91,322	0.063	1,392	4.27	323,006	0.48	50,302
2002	8,874,597	2.58	178,120	0.069	2,886	4.29	643,989	0.53	64,290
2001	9,335,736	2.47	156,917	0.072	4,355	4.45	912,859	0.59	113,412
2000	8,900,946	2.53	200,423	0.074	4,500	5.03	625,143	0.53	69,967
1999	6,743,321	2.68	138,272	0.089	3,198	5.49	245,078	0.67	30,510
1998	3,404,616	2.72	73,645	0.079	1,740	5.28	306,679	0.56	31,590
1997 (½)	1,631,448	2.89	41,120	0.076	805	6.06	175,266	0.60	15,521
1996-97	3,003,886	3.00	75,444	0.086	1,758	6.36	608,514	0.53	28,410
1995-96	3,107,985	3.01	83,050	0.076	1,634.5	6.65	381,479	0.59	33,214
1994-95	2,378,231	3.02	68,541	0.070	1,073.4	6.66	314,513	0.56	31,235
1993-94	2,390,160	2.96	66,684	0.079	1,271.6	7.80	423,374	0.45	25,968
1992-93	2,385, 231	3.06	69,502	0.083	1,350.9	9.23	392,583	0.61	31,912
1991-92	1,929,855	3.22	62,082	0.107	1,369	10.01	467,192	0.57	22,851
1990-91	1,714,300	3.20	48,249	0.114	1,482	14.13	402,035	0.73	31,879
1989-90	1,528,257	3.07	37,799	0.098	1,004.5	16.34	126,010	0.93	18,127
1988-89	1,129,507	3.57	16,868	0.126	912	22.16	-	0.63	2,103
1982-87 [1]	2,518,567	-	-	-	-	-	-	-	-
1982-85 [2]	>300,000								
1984-85 [3]	333,575	-	-	-	-	-	-	-	-
1984 [P]	19,870 [P]	??	660	??	9.0	-	-	-	-

[1] Total ore and waste rock hoisted to the surface by December 1987 [93].
[2] Total ore hoisted to the surface by end of 1985, plus total waste rock of >700,000 t [93].
[3] This is the ore and waste rock hauled to the surface during exploration and underground development out from the Whenan Shaft, July 1984 to June 1985 [26], figure does not include ore from earlier and later works. The higher grade ore was used for metallurgical test purposes and processing at the on-site pilot plant [26].
[P] Pilot plant production (Jan. to Nov. 15, 1984) - 78,110 t of ore was crushed and 19,870 t milled to produce copper concentrate and ammonia diuranate ('yellowcake').

Note : t is tonnes (1 t = 1,000 kg = 1 million g); oz is ounces (troy; 1 oz = 31.103 g).

Olympic Dam - Quarterly Cu-U-Au-Ag Production

Quarter Ending		Ore Milled	Copper (Cu)		Uranium (U_3O_8)		Silver (Ag)		Gold (Au)	
		t	%	t	%	t	g/t	oz	g/t	Oz
2003	June	2,334,685	2.19	49,644	0.064	735	4.32	173,340	0.48	23,371
	March	1,941,782	2.57	41,678	0.061	635	4.22	149,666	0.49	26,931
2002	Dec.	2,172,677	2.57	48,328	0.069	826	4.12	191,001	0.51	13,682
	Sept.	2,235,437	2.67	41,966	0.076	873	4.86	131,705	0.52	13,003
	June	2,276,650	2.53	38,977	0.064	595	4.08	157,199	0.53	17,957
	March	2,189,833	2.53	48,849	0.066	597	4.09	164,084	0.55	19,648
2001	Dec.	2,225,514	2.52	43,606	0.075	673	4.30	226,959	0.50	28,596
	Sept.	2,429,732	2.51	53,028	0.077	1,400	4.48	225,917	0.63	25,855
	June	2,316,517	2.62	51,080	0.074	1,270	4.70	233,509	0.61	29,620
	March	2,363,973	2.23	52,809	0.061	1,012	4.30	226,474	0.62	29,341
2000	Dec.	2,281,779	2.39	53,009	0.072	1,189	4.98	313,885	0.52	28,847
	Sept.	2,369,176	2.56	52,949	0.080	1,343	5.19	112,232	0.52	22,455
	June	2,051,106	2.55	48,314	0.070	1,008	4.96	181,659	0.52	11,016
	March	2,198,885	2.61	46,151	0.072	960	4.96	17,367	0.57	7,649
1999	Dec.	1,980,472	2.58	45,085	0.115	973	7.44	24,964	0.84	3,548
	Sept.	2,015,299	2.61	44,054	0.079	1,114	4.51	35,855	0.61	6,998
	June	1,689,058	2.87	27,212	0.076	613	4.72	82,478	0.62	8,564
	March	1,058,492	2.69	21,921	0.078	498	4.96	101,781	0.55	11,400
1998	Dec.	865,153	2.61	18,248	0.078	464	5.00	43,281	0.55	5,236
	Sept.	856,184	2.81	16,408	0.080	446	5.32	78,786	0.54	8,007
	June	881,439	2.78	19,503	0.077	405	5.36	88,742	0.58	8,521
	March	801,840	2.66	19,486	0.083	425	5.46	95,870	0.57	9,826
1997	Dec.	826,037	2.84	19,458	0.076	418	6.00	115,408	0.61	7,570
	Sept.	805,411	2.95	21,662	0.076	387	6.12	59,858	0.58	7,951
	June	820,327	2.77	19,865	0.074	405	5.28	85,172	0.53	7,487
	March	684,012	2.99	16,219	0.088	471	6.54	63,016	0.56	5,329
1996	Dec.	770,881	2.94	18,951	0.095	462	6.45	99,385	0.53	7,797
	Sept.	728,666	3.30	20,409	0.085	420	7.30	99,269	0.52	7,797
	June	797,848	3.16	22,991	0.085	444.0	6.71	108,698	0.52	8,678
	March	800,155	2.82	18,972	0.070	393.6	6.29	272,781	0.62	24,536
1995	Dec.	744,412	2.96	19,700	0.078	446.5	6.10		0.54	
	Sept.	765,570	3.17	21,387	0.070	350.4	7.50		0.66	
	June	627,632	3.17	18,274	0.073	299.8	6.88	314,513	0.44	31,235
	March	590,953	2.76	18,923	0.071	259.7	6.27		0.57	
1994	Dec.	607,849	3.05	14,780	0.066	251.2	7.34		0.60	
	Sept.	551,797	3.08	16,564	0.072	262.7	6.06		0.65	
	June	594,985	2.65	16,244	0.076	290.4	6.72	423,374	0.43	25,968
	March	626,094	3.09	16,483	0.076	328.9	6.53		0.43	
1993	Dec.	562,597	2.99	15,022	0.084	307.8	8.57		0.46	
	Sept.	606,484	3.09	18,934	0.081	344.5	9.45		0.48	
	June	600,614	2.96	17,551	0.068	290.0	9.15	392,583	0.54	31,912
	March	585,603	3.04	15,067	0.087	361.8	8.41		0.44	
1992	Dec.	593,944	3.06	18,195	0.094	404.9	8.83		0.68	
	Sept.	605,070	3.16	18,689	0.082	294.2	10.50		0.76	
	June	566,159	3.32	17,117	0.104	340	9.6	117,528	0.66	7,303
	March	473,262	3.25	15,942	0.112	353	9.5	119,940	0.55	5,612
1991	Dec.	470,756	3.07	14,679	0.104	347	11.1	116,515	0.58	4,913
	Sept.	419,678	3.22	14,344	0.109	329	9.9	113,209	0.46	5,023
	June	436,328	3.29	12,509	0.114	362	9.9	150,751	0.48	5,815
	March	423,786	3.29	11,864	0.100	295	16.4	114,617	0.60	7,220

Olympic Dam - Quarterly Cu-U-Au-Ag Production

Quarter Ending		Ore Milled t	Copper (Cu) %	Copper (Cu) t	Uranium (U_3O_8) %	Uranium (U_3O_8) t	Silver (Ag) g/t	Silver (Ag) oz	Gold (Au) g/t	Gold (Au) oz
1990	Dec.	438,769	3.41	12,768	0.123	419	15.5	82,604	0.70	10,487
	Sept.	415,417	2.80	11,108	0.117	406	14.8	54,064	1.16	8,357
	June	387,862	2.53	9,100	0.097	242	12.9	41,604	1.52	5,940
	March	369,607	2.88	9,026	0.089	202	15.3	680	1.07	3,318
1989	Dec.	380,444	3.50	9,447	0.100	277	18.5	-	0.47	4,500
	Sept.	390,344	3.35	10,226	0.106	283.5	18.62	-	0.65	4,369
	June	339,855	3.31	8,025	0.118	287	20.0	-	0.73	2,103
	March	250,974	3.38	4,009	0.109	173	22.0	-	0.60	-
1988	Dec. ½	538,678	3.83	4,834	0.140	452	23.6	-	0.59	-

WMC - Uranium Export Notes

- 2002 - Unspecified exports to Britain, Finland, Sweden, Belgium, France, Japan, Canada & USA. New long-term contracts with the utilities in the European Union, USA and Asia also signed.
- 2001 - Unspecified exports to Britain, Finland, Sweden, Belgium, France, Japan, Canada & USA.
- 2000 - Exports of about 4,000 t U_3O_8 to Britain, Finland, Sweden, Belgium, France, Japan, Canada and USA (planned, actual unspecified).
- 1999 - Exports of about 2,800 t U_3O_8 to Britain, Sweden, Finland, Belgium, Japan, Canada and USA (planned only, actual unspecified).
- 1998 - Export sales totalled 1,801 t U_3O_8 to :
  - **Britain (UK)** - Nuclear Electric, Magnox Electric and British Nuclear Fuels Ltd (BNFL); **USA** - Texas Utilities Electric, PSE&G and PG&E; **Korea** - Korea Electric Power Corporation; **Japan** - Tokyo Electric Power Co, Kansai Electric Power Co and Kyushu Electric Power Co; **Finland** - Teollisuuden Voima Oy; **France** - Electricite de France (EdF); **Sweden** - Vattenfall Bransle; **Belgium** - Synatom SA.
- 1997 - Export sales totalled 2,297 t U_3O_8, similar to countries and companies as in 1996 and 1998.
- April 17, 1997 - 10-year contract to supply 907 t U_3O_8 annually to Tokyo Electric Power Co. (TEPCO), Japan.
- December Half 1996 - WMC signed a new contract to supply Electricite de France (EdF), France.
- 1996 - Export sales totalled 1,654 t U_3O_8 to :
  - **Britain (UK)** - Nuclear Electric, Magnox Electric and British Nuclear Fuels Ltd (BNFL); **USA** - Texas Utilities Electric, PSE&G and PG&E; **Korea** - Korea Electric Power Corporation; **Japan** - Tokyo Electric Power Co, Kansai Electric Power Co and Kyushu Electric Power Co; **Finland** - Teollisuuden Voima Oy; **France** - Electricite de France (EdF); **Sweden** - Vattenfall Bransle; **Belgium** - Synatom SA; **Canada** - Ontario Hydro.

References : Financial reports - Half-Yearly & Full-Yearly, Form-20F's & ASX documents (WMC website).

WMC - Olympic Dam Emissions, Energy & Environmental Data

	Spills & Leaks		Water		Energy		CO_2		SO_2		Dist.	Reh'd	Tailings
			Total	Rate	Total	Rate	Total	Rate	Total	Rate	Land	Land	Area
Year	(No.)	(ML)	(ML)	(kL/t)	(TJ)	(MJ/t)	(t)	(kg/t)	(t)	(kg/t)	(ha)	(ha)	(ha)
2003	1	0.21											
2002	??	1.374	10,728	1.209	4,881	550	1,075,792	121	2,791	0.314	0	0	380
2001	>15	4.216	10,348	1.108	5,216	559	1,086,681	116	3,518	0.377	34	0	380
2000	106	2.021	10,559	1.185	5,183	581	952,182	107	3,859	0.433	8	7	380
1999			8,658	1.283	4,621	685	837,133	124	2,636	0.391	10	10	380
1998			5,470	1.606	3,018	886	497,364	146	2,216	0.651	459	200	190
1997 (½)			2,531	1.551	1,350	827	222,665	136	1,081	0.662	-	-	190
1996-97			4,782	1.582	2,547	843	422,338	140	2,069	0.685	107	0	190
1995-96			4,677	1.499	2,390	766	398,024	128	2,147	0.688	286	15	
1994-95			4,220	1.775	2,003	842	351,509	148	930	0.391	6	0	
1993-94		>5,000 [1]	3,935	1.636	2,046	851	338,454	141	2,172	0.903	54	1	
1992-93			3,910	1.638	1,897	795	312,999	131	1,824	0.764	4	9	
1991-92			3,529	1.829	1,680	871	277,255	144	1,504	0.780	65	13	
1990-91			3,240	1.890	716	418	133,946	78	501	0.292	5	11	
Total		>5,008	76,587	1.413	37,548	699	6,906,342	125	27,248	0.550	1,038	266	380

[1] Estimated volume of tailings seepage announced in February 1994. The 'leak' had been occurring for some years.

Notes : The accounting data used for CO_2 and SO_2 emissions and energy usage were revised after the first report in 1994-95. Figures for 1990-91 are therefore likely double that indicated for CO_2 emissions and energy usage, triple for SO_2 emissions. Figures for the 1997 half year are caluclated based on ore milled in the December 1997 half-year and the rates reported for 1997-98 (rates stay the same).

References : WMC Environment Progress Reports.

WMC - Olympic Dam Production - Economic Value

	t Cu	$mill.	t U_3O_8	$mill.	oz Au	$mill.	oz Ag	$mill.
2001-02	184,460	$518.012	3,260	~$135.421	92,056	$50.594	774,159	$6.440
2000-01	209,847	$702.935	4,814	$217.776	110,263	$54.653	886,100	$7.483
1999-2000	183,604	$496.232	4,055	$172.077	29,211	$13.277	259,845	$2.134

[1] Although Olympic is almost the exclusive producer of Cu-U_3O_8-Au-Ag in SA, the values reported by [126] have been used and adjusted slightly where reliable data is known. Where some confusion exists, an '~' symbol is used in the value.

	Copper	Uranium	Gold	Silver
%Value	**72.2%**	**22.1%**	**5.0%**	**0.7%**

WMC - Olympic Dam Royalties to the SA Government

Financial Year	Royalties ($million)
2001-02	$27.933
2000-01	$32.282
1999-2000	$20.287

Financial Year	Royalties ($million)
1998-99	$11.431
1997-98	$10.827
1996-97	$10.309

References : ***CHECK CHECK CHECK***.

WMC - Annual Cu-U Division Corporate Data

Year	Revenue [1]	Profit [1]	Jobs [2]
2002	$855.4 million	$35.9 million	
2001	$913.2 million	$47.9 million	988 [E] - 314 [C]
2000	$798.0 million	$165.7 million	1,057 [E] - 377 [C]
1999	$491.6 million	$16.4 million	1,011 [E] - 381 [C]
1998	$350.9 million	$2.5 million	981 [E] - 270 [C]
1997 (½)	$410.1 million	$19.5 million	-
1996-97	$445.0 million	$83.5 million	823 [E&C]
1995-96	$445.6 million	$123.1 million	839
1994-95	$367.7 million	$102.0 million	780
1993-94	$285 million	$60 million	??
1992-93	$188 million	$47 million	??
1991-92	$130 million	$19 million	??
1990-91	$114 million	$24 million	??

[1] Revenue and Profit for the Copper-Uranium Division of WMC, until June 30, 1998, included the Nifty copper mine in WA (~10,000 t Cu per year; Nifty began in November 1993). 1991-94 and 1999 onward are Olympic Dam only, 1995-98 are estimated to be 95% or more Olympic Dam [2].
[2] Jobs are divided as employees (E) and contract workers (C).

All Olympic Dam & WMC tables compiled from Quarterly & Annual Reports of WMC Ltd, [2], [27], [69], [72], [84], [87], [93] and [98]. Additional quarterly production data supplied by email from WMC, February 2002 (with thanks).

South Australia : Uranium Production Value

	t U_3O_8			$Value [2]
	Olympic Dam [1]	Beverley [1]	Total [2]	
2001-02	3,260	633	4,005	161,716,446
2000-01	4,814	219	5,029	227,682,933
1999-2000	4,055	-	4,082	172,077,000

[1] Based on previous Olympic Dam and Beverley data tables.
[2] Data from Minerals & Petroleum South Australia Annual Reports [126].

Note : No attempt has been made to reconcile inconsistent production data (probably related to confusion over uranium ore concentrate versus contained uranium oxide – though this should not account for the difference based on the expected purity (eg. >99%) and the available data from Olympic Dam).

Annual Australian Uranium Production : 1976-2002

Calendar Year	Mary Kathleen	Nabarlek	Ranger	Olympic Dam	Beverley	Pilot Scale Mines/Mills	Australian Total
2003			2,705	1,392	322		4,419
2002			4,470	2,881.3	746		8,097.3
2001			4,203	4,355	546		9,104
2000			4,436.7	4,500	0	9.8 P	~8,946.7
1999			3,857.2	3,198	0	9.8 P	~7,065.2
1998			4,049.6	1,740	33.27 P	9.8 P	5,832.9
1997			4,791.8	1,681		(Honeymoon)	6,472.8
1996			4,138.2	1,719.6			5,857.8
1995			3,006.9	1,356.4			4,363.3
1994			1,461.8	1,133.2			2,595.0
1993			1,335.1	1,304.1			2,639.2
1992			1,350.3	1,392.1			2,742.4
1991			3,121.0	1,333			4,454.0
1990			2,894.7	1,269			4,163.7
1989			3,289.7	1,020.5			4,310.2
1988		578.1	3,712.4	452			4,742.5
1987		1,354.3	2,261.5				3,615.8
1986		1,402.3	3,496.6				4,898.9
1985		1,315.3	2,519.1			~0.47 P,E	3,834.9
1984		1,401.0	3,775.6	9 P		(Manyingee P ?)	5,185.6
1983		1,214	2,580.6				3,794.6
1982	859.4	1,258	3,134.6			(Honeymoon P ?)	5,252.0
1981	824.7	1,426	1,122.2				3,372.9
1980	834.5	1,006				>11 P,E	1,851.5
1979	832					(Yeelirrie)	832.0
1978	607.4						607.4
1977	420						420.0
1976	423						423.0
Total	**4,801.0**	**10,955**	**71,714**	**30,736**	**1,647**	**> 41**	**119,894 t**

As t U_3O_8. Compiled from [84], [88] and previous tables. P Pilot plant production only. E Estimate only.

Australian Uranium Production (& Exports) : 1950s-60s

	Northern Territory					SA	Queensland		Australia	
Cal. Year	Rum Jungle t U_3O_8	Moline t U_3O_8	Rock-hole t U_3O_8	Total t U_3O_8	Total Value £	Radium Hill Value £	Mary Kathleen t U_3O_8	Mary Kathleen Value £	Total t U_3O_8	Total Value £
'64	334.84	63.2	-	398.04	??	-	-	-	398.04	??
'63	274.2	99.2	-	373.40	??	-	727.96	6,986,764	1,100.36	6,986,764
'62	229.6	89.4	20.15	339.14	??	-	907.30	8,758,477	1,246.14	8,758,477
'61	237.7	83.3	63	383.99	??	2,200,000	873.48	8,525,000	1,257.99	10,725,000
'60	144.3	94.8	54.24	293.33	??	1,800,000	669.42	6,509,718	967.33	6,509,718
'59	148.8	62.08	14.81	229.42	788,177[1]	1,700,000	658.68	6,449,267	888.12	9,848,483
'58	153.8	8.83	-	164.71	44,449[1]	1,750,000	254.92	2,566,818	419.71	2,611,267
'57	179.79	61.66	-	241.45	328,514[1]	1,800,000	-	-	241.45	2,128,514
'56	??	??	-	??	485,277	1,750,000	-	-	??	2,235,277
'55	??	-	-	??	??	1,250,000	-	-	??	1,250,000
'54	??	-	-	??	??	-	-	-	??	??
Total	~1,875[2]	~713.5	139.7	~2,730	~£27 m	~£17.8 m	4,091.8	~£39.8 m	~7,672[3]	~£84.3 m

Compiled from [88] and previous tables.
[1] Excludes value of Rum Jungle production.
[2] Uranium sold to the CDA and not that stockpiled by the AAEC after January 1964 (~ 2,100 t U_3O_8).
[3] Includes 852 t U_3O_8 from Radium Hill/Port Pirie.

Note : Differences and discrepancies have tried to be reconciled, but cannot due to conflicting data.

Quarterly Australian Uranium Exports

		t U_3O_8	$mill.	$US/lb	$A/kg
Dec. [P]	2002	4,740	216.3	12.83	45.63
Sep. [P]					
June [P]		1,443	76	9.90	52.53
March [P]		1,454	71	9.83	48.94
Dec. [P]	2001	1,895	94	9.47	49.81
Sep. [P]		2,574	119	9.10	46.37
June		2,199	125	8.72	56.66
March		2,572	124	7.68	48.39
Dec.	2000	2,206	134	7.13	60.85
Sep.		2,745	114	7.80	41.54
June		1,977	94	8.53	47.46
March		1,828	84	9.33	45.91
Dec.	1999	2,371	100	9.65	42.36
Sep.		1,849	88	10.10	47.82
June		1,291	60	10.70	46.78
March		2,068	100	10.33	48.27
Dec.	1998	2,058	98	9.07	47.33
Sep.		572	30	10.32	52.71
June		1,221	64	10.78	52.76
March		1,702	78	11.22	45.69
Dec.	1997	2,100	87	12.32	41.36
Sep.		1,392	59	10.41	42.50
June		1,771	72	11.65	40.80
March		1,653	69	13.83	41.57
Dec.	1996	1,419	66	15.10	46.62
Sep.		858	38	16.30	44.38
June		1,105	51	16.37	46.35
March		2,043	93	14.72	45.39
Dec.	1995	1,138	48	11.92	42.46
Sep.		1,000	50	11.75	49.54
June		860	43	11.77	49.91
March		728	35	10.40	48.58
Dec.	1994	1,285	63	9.37	49.33
Sep.		1,196	46	9.13	38.67
June		966	51	9.27	52.53
March		320	9	9.47	28.53
Dec.	1993	1,642	71	9.97	43.35
Sep.		1,064	62	10.03	58.49
June		317	14	10.03	44.42
March		632	39	9.90	62.41
Dec.	1992	470	21	10.25	45.23
Sep.		869	48	8.18	54.98
June		1,220	51	7.75	41.61
March		402	24	7.95	60.77
Dec.	1991	1,657	86	7.80	52.05
Sep.		1,450	83	8.57	57.48
June		1,302	91	9.12	69.84
March		599	41	9.30	68.66
Dec.	1990	3,424	156	9.28	45.65
Sep.		1,893	84	11.08	44.16
June		1,292	91	9.88	70.11
March		832	55	8.78	65.86

	t U_3O_8	$mill.	$US/lb	$A/kg
1989	1,043	84	9.20	80.44
	556	45	9.70	81.38
	1,605	127	9.92	79.35
	1,230	95	11.17	76.87
1988	1,168	94.799	12.47	81.16
	1,057	85.851	14.22	81.22
	1,197	10.527	15.42	90.66
	905	83.355	16.12	92.13
1987	1,975	181.268		91.78
	417	38.226		91.67
	958	84.315		88.01
	405	38.336		94.66
1986	2,438	213.106		87.41
	563	53.183		94.46
	1,165	106.315		91.26
	0	0		0
1985	602	56.495		93.85
	1,453	133.106		91.61
	717	70.581		98.44
	675	54.567		80.84
1984	754	59.798		79.31
	1,295	132.426		102.26
	738	68.194		92.40
	520	51.661		99.35
1983	1,405	128.799		91.67
	761	70.272		92.34
	589	50.611		85.93
	518	46.326		89.43
1982	1,431	113.846		79.56
	1,893	143.131		75.61
	630	47.991		76.18
	1,505	110.079		73.14
1981	481	33.596		69.85
	160	11.347		70.92
	523	40.427		77.30
	461	34.673		75.21
1980	381	35.021		91.92
	148	14.660		99.05
	168	11.765		70.03
	434	31.245		71.99
1979	382	37.432		97.99
	226	16.484		72.94
	223	17.164		76.97
	486	31.195		64.19
1978	289	18.007		62.31
	165	9.397		56.95
	363	21.380		58.90
	297	18.134		61.06
1977	408	23.787	Dec. Q	58.30
	1,545	74.417	Year	48.17
1976	36	0.021	Year	0.58

Compiled from mostly from [84] (and partly [2]). Note - $US/lb is NUEXCO exchange value; $A/kg is average export unit value. [P] Provisional data only. Financial years 1993/94 and 1994/95 included 852 t and ~880 t, respectively, from the Commonwealth stockpile leftover from Rum Jungle (stored for ANSTO at Ranger, NT, by ERA).

Australian Uranium Exports by Calendar Year

	t U_3O_8	$million	$US/lb	$A/kg
2002 [P]	7,637	363	11.73	47.57
2001	9,240	462	8.69	50.09
2000	8,756	426	8.12	48.65
1999	7,579	348	10.12	46.06
1998	5,553	269	10.23	48.58
1997	6,916	287	12.12	41.50
1996	5,425	248	15.41	45.75
1995 [a]	3,726	176	11.54	47.28
1994 [a,b]	3,767	169	9.28	45.00
1993 [b]	3,655	186	9.98	51.15
1992	2,961	144	8.30	48.71
1991	5,008	301	8.55	60.23
1990	7,441	386	9.79	51.78
1989	4,434	351	10.07	79.17
1988	4,327	274.532	14.48	86.10
1987	3,755	342.145		91.12
1986	4,166	372.604		89.44
1985	3,424	314.749		91.92
1984	3,259	312.079		95.76
1983	3,233	296.008		91.56
1982	5,459	415.047		76.03
1981	1,625	120.044		73.87
1980	1,210	98.391		81.31
1979	1,317	102.275		77.66
1978	1,114	66.918		60.07
1977	1,545	74.417		48.17
1976	36	0.021		0.58
Totals	125,930 t	$6,900.8	$10.46	$60.06

[P] Preliminary data.

[a,b] In 1993/94 and 1994/95, 852 and 880 t U_3O_8 were exported from the Commonwealth stockpile (ie. Rum Jungle).

Compiled from from [84] & [88].

Uranium Export Data by Country

ERA Sales to the United States		
Year	t U_3O_8	$US/lb
2002 [1]	<4,925	$9.74
2001 [2]	<4,678.4	$9.51
2000 [3]	<5,770.6	$9.20
1999	3,320.0	$10.93
1998 [4]	1,250.7	$11.43
1997 [4]	1,973.7	$13.11
1996	2,067.6	$14.66
1995	2,017.7	$10.98
1994	1,275.6	$9.88
1993	1,469.6	$10.65
1992	1,827.5	-
1991	2,139.1	-

		Total Australian Exports (t U_3O_8)			
Year	Quarter	France	Germany	USA	Other
1989	March	506	68	249	407
1988	Dec.	272	68	505	323
	Sep.	309	68	415	265
	June	113	210	677	197
	March	379	68	101	357

[1] US-DoE data for 2002 includes some some U_3O_8 from Olympic Dam (WMC) and Beverley (General Atomics); no figures available to allow credit of the respective U_3O_8 quantities to ERA, WMC or GA. It is quite likely that the U_3O_8 sold through ConverDyn includes a small proportion of U_3O_8 production from the Beverley uranium mine.

[2] US-DoE data for 2001 includes some some U_3O_8 from Olympic Dam (WMC); no figures available to allow credit of the respective U_3O_8 quantities to ERA or WMC. It is quite likely that the U_3O_8 sold through ConverDyn includes a small proportion of U_3O_8 production from the Beverley uranium mine operated by parent company General Atomics. (ERA's 2001 Annual Report states that 31% of sales over the 18-month period from July 2000 to December 2001 were to the USA, suggesting something of the order of 1,967 t U_3O_8).

[3] US-DoE data for 2000 includes some some U_3O_8 from Olympic Dam (WMC); no figures available to allow credit of the respective U_3O_8 quantities to ERA or WMC. (ERA's 2000 Annual Report states that 42% of sales were to the USA, suggesting something of the order of 3,000 t U_3O_8 sold to the USA in the calendar year 2000).

[4] US-DoE data includes U_3O_8 from Olympic Dam (WMC); figure for 1998 based on the average proportion of USA sales in ERA annual reports (US-DoE 1998 total - 2,616.4 t U_3O_8), while for 1997, the proportion of USA sales based on ERA's annual reports gives a higher figure than that above (ERA state 45.9% of sales were to 'North America' in their 1996-97 Annual Report).

Compiled from [84], [85] & [86].

	USA	Canada	Japan	South Korea	Total
2001	3,666.61	158.83	2,158.21	848.16	8,243.06
2000	4,152.1	99.6	2,153.7	1,025.3	8,792.1
1999	2,302.0	171.6	2,246.6	687.6	7,171.7
1998	1,644	85	1,588	1,118	6,035
1997 [1]	~1,600	??	~1,600	1,314	6,916
1997-98					6,416
1996 [1]	~1,500		~1,500	542	5,424

	UK	France	Sweden	Germany	Belgium	Finland
2001	407.45	497.16	200.47	158.76	88.45	58.97
2000	486.9	497.1	235.8	0 (??)	88.5	53.1
1999	599.7	497.2	366.7	158.8	88.4	53.1
1998	538	372	390	159	88	53
1997 [1]	??	968	??	??	??	??
1996 [1]	759	??	??	??	??	??

[1] Exact country export data not available.

Compiled from [2] & [97]. Note conflict with above tables.

Australian Obligated Nuclear Material (AONM)

Uranium and nuclear materials 'flagged' as Australian under IAEA safeguards agreements.

AONM Located Overseas

(tonnes)	NatU	U@Enr	DepU	LEU	Irr. Pu	Sep. Pu	Th	Total
2001	20,800	21,409	52,083	7,480	63.4	0.6	86	101,922
2000	19,045	19,590	47,787	7,073	56.4	0.5	86	93,638
1999	16,590	24,518	38,384	6,672	47.3	1.6	86	86,299
1998	12,990	21,067	36,135	6,300	42.0	1.4	86	76,621
1997	13,043	17,183	33,467	5,821	35.4	1.3	86	69,637
1996	12,736	12,813	31,174	5,412	30.0	1.2	86	62,252
1995	12,013	10,294	28,513	5,041	24.7	1.2	86	55,974
1994	10,721	10,931	24,384	4,776	19	1	86	50,918
1993	11,072	9,947	21,875	4,429	16	-	86	47,425
1992	12,573	10,834	18,587	3,739	14	-	86	45,833
1991	13,992	8,389	16,983	3,194	10.791	-	-	42,569
1990	11,824	9,004	11,990	2,431	7.770	-	-	35,257
1989	13,105	8,352	8,170	1,917	6.076	-	-	31,550
1988	11,963	7,411	6,552	1,728	4.653	-	-	27,659

(as t U) : NatU - Natural Uranium; U@Er - Uranium at Enrichment Plants; DepU - Depleted Uranium; LEU - Low Enriched Uranium. (as t) : Irr. Pu - Irradiated Plutonium (ie. within nuclear waste); Sep. Pu - Separated Plutonium; Th - Thorium.

Note : Quantities as at December 31, each year. See ASNO Annual Reports [97] for non-specific country details.

AONM Within Australia

	U_3O_8	NatU	DepU	Th	Special Fissionable Material # (g)		
	T	kg	kg	kg	U-235	U-233	Pu-239
2002	1,261 [1]	10,825	10,499	59,902	171,607	5	2,046
2001	1,057	10,480	12,085	62,517	168,433	4	2,033
2000	1,248	11,136	10,246	61,035	233,706	4	2,044
1999	1,051	11,126	10,246	61,035	270,771	4	2,063
1998	418	10,249	9,993	61,035	267,785	4	2,094
1997	1,246	10,119	9,742	61,082	298,773	4	2,094
1996	2,443	10,144	9,766	61,086	269,575	4	2,206
1995	1,172	10,144	9,766	61,087	286,706	4	2,211
1994	2,940	10,144	9,766	61,087	286,371	4	2,240
1993	6,793	10,146	9,763	61,087	284,400	4	2,240
1992	6,214	10,168	9,764	61,087	259,033	4	2,243
1991	6,797	10,163	9,447 [2]	61,096	259,032	4	2,243
1990	6,803	11,065	24,079	61,096	259,030	4	2,243
1989	6,443	10,986	24,121	61,067	252,296	12	2,243
1988	9,953	11,009	23,838	44,912	250,173	4	2,243
1987	7,011	11,019	24,079	19,614	241,970	4	2,814

U_3O_8 - Uranium Ore Concentrate ('UOC'); NatU - Natural Uranium (other than UOC); DepU - Depleted Uranium; Th - Thorium; Pu - Plutonium (Pu with >80% Pu-238 not included).

Fissile elements contained in fuel rods and spent fuel at the HIFAR nuclear research reactor, Lucas Heights, NSW. The ^{235}U content does not reflect burnup (eg. 1994 actual ^{235}U is about 170,000 g).

[1] A further 4 t U_3O_8 is listed as being used in research.

[2] Change due to 'deregulation'.

Note : Quantities as at June 30, each year.

Both tables compiled from Annual Reports of the Australian Safeguards & Non-Proliferation Office (ASNO) [97].

South Australian Uranium Deposits

Deposits & Proposals	Disc.	Total t U_3O_8	Grade (%)	Cutoff (%)	Ore (Mt)	Current Company	Ref's
Stuart Shelf							
Olympic Dam [1]	July 1975	1,152,000	0.04		2,880	WMC	[28] [72]
Acropolis Well	1979		0.007			WMC (?)	[29] [8]
Lake Frome							
Beverley	Nov. 1969	21,000	0.18			Heathgate	[30]
East Kalkaroo	1971	910	0.074			SCR	[31] [32]
Gould's Dam	Late 1974	17,640	0.098		18.0	SCR	[31] [32]
Honeymoon	Nov. 1972	3,300	0.12			SCR	[31] [32]
Paralana-Pepegoona	1970	1,000	0.2			Heathgate	[96]
Yarramba	1970	300	0.14			SCR	[32]
Gawler Craton							
Warrior-Malbooma	1973	4,000	0.034		11.76	Uncertain	[33] [115]
Yarranna	1981	??	0.03 ?			Uncertain	[34]
Mt Painter							
Armchair-Streitberg	1910 (?)	1,814	0.1	0.05	1.8144	??	[8]
East Painter	1910 (?)		low ?		5 ?	??	[35]
Hodgkinson	1910	567	0.25	0.05	0.2268	??	[8]
Mt Gee	1910	2,722	0.1	0.05	2.7216	??	[8]
Radium Ridge	1910	2,177	0.06	0.05	3.6288	??	[8]
Mt Painter (*total Excl. East Painter*)	1910	3,800	0.10			??	[36] [8]
Olary (Ethiudna)							
Radium Hill [2]	1906	80.1	0.009		0.89	??	[118]
Crocker's Well	1951	5,000 625	0.05 0.031		10.0 ??	Equinox	[8] [29]
Mt Victoria	1954	207	0.315		66 kt	Equinox	[8]

Notes : The Mt Victoria (Olary) region, with numerous small uranium occurrences, is now referred to as the "Ethiudna" exploration project of Equinox Resources. The Yarramba deposit is sometimes incorrectly confused as the "Honeymoon Extension", although Yarramba is not included in the current proposed Honeymoon project resource estimate (which is only Honeymoon, Honeymoon Extension and East Kalkaroo).

[1] The Olympic Dam orebody also contains 1.2% copper, 0.5 g/t gold and 2.9 g/t silver.
[2] Remaining ore after commercial mining from 1954-61.

Western Australian Uranium Deposits

Deposits & Proposals	Disc.	Total t U_3O_8	Grade (%)	Cutoff (%)	Ore (Mt)	Current Comp.	Ref's
Carnarvon							
Bennett's Well	1981	1,500	0.16			EBR	[37]
Manyingee	1974	12,078	0.08	0.02 ?		PR	[38] [70]
Turee Creek							
Angelo River A	1980-81	797	0.124		0.643	AU	[39] [8]
Angelo River B	1980		0.047			AU	[39]
Noranda	1973	250	0.05		0.5	Unknown	[39] [8]
Turee Creek		392	0.037		1.05	AU	[40]
Canning Basin							
Myroodah	1980's		0.048 ?			AU	[41]
Oobagooma	1978 ?	9,945 5,000	0.12	0.03		PR	[38] [115]
Gascoyne							
Mortimer Hills	1974		0.015			Unknown	[8]
Rudall River							
Kintyre	April '85	36,000	0.15-0.4	0.05		Rio Tinto	[42]
Central WA							
Centipede		3,800	0.1			WilunaM	[39] [115]
Lake Maitland	1971	7,863	0.0518	0.02	15.168	AU	[43]
Lake Mason	Early '70's	2,700	0.035			AU	[39]
Lake Raeside	Early '70's	1,700	0.025			WilunaM	[39] [115]
Lake Way	1972	5,200	0.087	0.029		Uncertain	[8] [44] [3]
Lakeside	Early '70's	520	0.026	0.01	2.00	AU	[41]
Lyndon / Jailor Bore	Early '70's	715				AU	[45]
Millipede / Abercromby	Early '70's	502 / 1,745	0.049 / 0.070	0.02	1.107 / 2.939	AU	[43]
Minindi-Mooloo Downs	Early '70's	432	0.0121		3.5	Uncertain	[45]
Mulga Rock	1979	15,330	0.14	0.035	10.8	PNC	[46] [115]
Nowthanna JV	1969	4,626	0.045	0.02	10.37	AU	[43]
Thatcher Soak		6,000	0.04			Unknown	[45] [39]
Yeelirrie	1970	52,500	0.15		35.2	WMC	[47] [115]

Notes (Year Discovered) : Miscellaneous prospects include Anketell, Cogla Downs, Gascoyne, Killi Killi Hills (1960), Lake Austin, Lyndon, Mundong Well (1972), Wondinong, Yanrey, Yinnetharra.

(JV - Joint Venture; WilunaM -p Wiluna Mines Ltd)

Queensland Uranium Deposits

Deposits & Proposals	Disc.	Total t U_3O_8	Grade (%)	Cutoff (%)	Ore (Mt)	Current Company	Ref's
Mt Isa							
Anderson's Lode	May 1954	2,041	0.167		1.24	Summit	[49] [9]
Elaine	1950's	100	0.06		~0.17	??	[109] [115]
Mary Kathleen	4 July '54	1,200	0.115		~1.04	-	[8]
Valhalla	1954	16,531	0.144	0.08	~11.5	Summit	[48] [115]
Valhalla South	1954	907				Summit	[49]
Skal	10 Mar. '54	3,450	0.13	0.05	~2.7	Summit	[48] [115]
Townsville							
Ben Lomond [1]	1975	4,758	0.247		1.93	Cogema [1]	[50] [8]
Georgetown	1970's	590	0.155	0.045	0.375	Unknown	[51]
Maureen	July 1971	2,940	0.123	0.035	2.383	Unknown	[52]
Newcastle Range	1972	907				Unknown	[53] [68]
Trident	1970's ?	495	0.224			Unknown	[8] [115]
Twogee	1970's ?	755	0.117			Unknown	[8] [115]
Westmoreland [2]							
Garee (lens)	1960's ?	1,500	0.18			Rio Tinto	[8]
Jack (lens)	1960's ?	1,405	0.16			Rio Tinto	[8]
Longpocket (lens)	1960's ?	2,000	0.045			Rio Tinto	[7]
Namalangi (lens)	1960's ?	4,745	0.17			Rio Tinto	[7]
Outcamp (lens)	1976 ?	945	0.16		~0.59	Rio Tinto	[8] [115]
Sue (lens)	1976	675	0.16		~0.42	Rio Tinto	[8] [68] [115]
Junnagunna (total)	1976	5,300	0.098		5.4	Rio Tinto	[54] [8] [68]
Huarabagoo (total)	1968	3,000	0.169		1.8	Rio Tinto	[54]
Redtree (total)	Nov. 1956	12,600	0.126		10.2	Rio Tinto	[54] [48] [115]
Westmoreland **(overall total)**	1956	20,900	0.12		17.4	Rio Tinto	[54] [115]

[1] In October 1998, Anaconda Uranium Corporation (Canadian) renegged on their contract to buy Ben Lomond from Cogema. Current owner uncertain, but presumably Cogema.

[2] The Westmoreland area is really a large area of small deposits ("lenses") concentrated at specific zones, such as Redtree which includes the Garee, Jack and Namalangi lenses, the larger Junnagunna deposit and the nearby Sue, Outcamp and Long Pocket (Black Hills) lenses. Other prospects includes Moongooma, Oogoodoo and Mageera. Several names have come and gone over the years for the numerous spots, however, Ref. [54] gives a good overview and current resource estimates.

Northern Territory Uranium Deposits

Deposits & Proposals	Disc.	Total t U_3O_8	Grade (%)	Cutoff (%)	Ore (Mt)	Current Company	Ref's
McArthur River							
Pandanus Creek	1955	291	0.56		52 kt	Rio Tinto	[8]
Rum Jungle							
Adelaide River	1954	12.1 8	0.22 0.5		~7.1 kt	Unknown	[8]
Mt Fitch	1966	1,500	0.042		~3.5	Unknown	[55] [115]
Kakadu							
Allamber [3]	??	746.5	0.125		0.598	??	[109] [115]
Austatom	Nov. 1976	10,000	~0.2			(AAEC)	[8] [56] [75]
Caramal	??	2,500	~0.33		~0.758	??	[109] [115]
Hades Flat		726				ERA	[8] [56] [115]
Coronation Hill [1]	June 2, 1953	1,850	0.537		0.3442	(BHP)	[99] [115]
Jabiluka 1	Late 1971	3,400	0.25	0.05	1.36	ERA	[57] [8]
Jabiluka 2	Late 1973	163,000	0.53	0.2	31.1	ERA	[57] [90]
Koongarra 1	Late 1969	14,550	0.795	0.09	1.831	Cogema	[58]
Koongarra 2	Late 1969	2,300	0.3		~0.77	Cogema	[3] [115]
Ranger 1 [2]	Late 1969	63,500	0.321		19.78	ERA	[59] [60] [61]
Ranger 3 [2]	Late 1969	~81,000	0.23		33.2	ERA	[103]
Ranger 68	28 Nov. '76	5,500	0.357	0.10	1.5	(ERA)	[62] [56] [115]
South Alligator							
Anomaly 2J	1971	~ 5	0.022			-	[63]
Katherine					(t)		
ABC Prospect	1953	5.0	0.25		1,990	??	[5]
Central Australia							
Angela-Pamela	1974	12,000	0.1			BRM	[64] [115]
Biglyri	1973	6,000 2,774	0.3 0.351		~2.0 ~0.79	Resolute	[65] [115]
Napperby	1973	6,000	0.036		~16.7	PR	[8]
Walbiri	1973	686	0.162		~0.42	??	[8] [115]

Notes - The Ranger 2 prospect is located within Stage 1 of Kakadu NP, and was thought to possibly contain a "high grade mineable resource" (exploration is incomplete). The Austatom and Ranger 68 (also known as Barote Springs) deposits lie within Stage 2 of Kakadu National Park.

[1] Coronation Hill was originally mined in the late 1950s. This deeper ore resource was established by BHP and partners during the proposal to remine the site for gold-platinum-palladium in the late 1980s. Further uranium mineralisation was known to exist outside their planned pit and possibly in conjunction with underground mine extensions.
[2] Ranger 1 is now mined out (by Dec. 1994), and Ranger 3 is currently being mined (resource figure used includes previously mined ore). Estimates of the ore reserves for Ranger 3 vary widely from time to time. Value from latest ERA Annual Report [103]. (Mill extraction efficiency is about 89.3%).
[3] Allamber is comprised of 2 separate ore zones – Twin & Dam, with Dam being 1.5 times that of Twin.

Note : The Austatom deposit was discovered by the Australian Atomic Energy Commission (hence name), now ANSTO.

Some Units & Abbreviations

Ag	Silver	
Au	Gold	
Cu	Copper	
U_3O_8	Uranium Oxide ("yellowcake")	
kt	thousand tonnes ($k = 10^3$)	
Mt	million tonnes ($M = 10^6$)	
foz	fine ounces (usually use "troy" oz = 31.1 g)	
t	tonne (1,000 kg)	(short ton = 0.9072 t; long ton = 1.016 t)
lb	pound (0.4536 kg)	(1 t = 2,204.5 lb) (using imperial lbs)

Some Acronyms

AAEC	Australian Atomic Energy Commission (now ANSTO)
ANAWA	Anti-Nuclear Alliance of Western Australia
IAEA	International Atomic Energy Agency
ISL	In Situ Leaching
JV	Joint Venture
OECD	Organisation for Economic Co-operation and Development
SEA-US	Sustainable Energy and Anti-Uranium Service Inc.
UIC	Uranium Information Centre
URG	Uranium Research Group

Companies

AU	Acclaim Uranium NL
Acclaim Exp.	Acclaim Exploration NL
BRM	Black Range Minerals NL
Cogema	subsidiary of French "Compaigne Generale des Matieres Nucleaires"
EBR	Eagle Bay Resources NL
ERA	Energy Resources of Australia Ltd
Equinox	Equinox Resources NL
Heathgate	Heathgate Resources (subsidiary of *General Atomics*, USA)
MIM	Mt Isa Mines Ltd
PNC	Power Reactor and Nuclear Fuel Development Corporation of Japan (now JNC - Japan Nuclear Fuel Cycle Development Corporation)
PR	Paladin Resources NL
PR / BRM	Paladin Resources and Black Range Minerals Joint Venture project
QML	Queensland Mines Ltd
Rio Tinto	Rio Tinto - now merged with former CRA Ltd, subsidiary Canning Resources Ltd owns Kintyre and Westmoreland deposits.
SCR	Southern Cross Resources Inc. (Canadian)
Summit	Summit Resources NL (New Zealand)
Total	Total Mining Australia (French)
WMC	Western Mining Corporation, now WMC Resources Ltd

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