

# Uraniumletter INTERNATIONAL

*the international independent information and advice bulletin for uranium resource investments*

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## NUCLEAR POWER IN AUSTRALIA

Uranium in Australia has been mined since 1954, though only 3 mines (**Ranger**, owned and operated by Energy Resources of Australia (ERA), a 68.39% subsidiary of Rio Tinto, **Olympic Dam**, owned and operated by BHP Billiton and **Beverley**, owned and operated by Heathgate Resources).

Australia is the world's third-ranking producer behind Kazakhstan and Canada.

Calendar year 2010 production totaled 6,958 tonnes U<sub>3</sub>O<sub>8</sub> (5,900 tonnes U). of this total 3,793 tonnes from Ranger, 2,747 tonnes from Olympic Dam and 418 tonnes from Beverley.

Australia uses no nuclear power, but with high reliance on coal (78% of its electricity) and likely carbon constraints on electricity generation, it remains a possibility.

In the 1930s ores were mined at Radium Hill and Mount Painter in Southern Australia to recover radium for medical purposes. As a result, a few hundred kilograms of uranium were also produced.

Uranium ores as such were mined and treated in Australia from the 1950s until 1971.

Radium Hill (Southern Australia), Rum Jungle (Northern Territory) and Mary Kathleen (Queensland), were the largest producers of uranium (as yellowcake).

Production ceased either when ore reserves were exhausted or constraints were filed. Sales were to supply mainly primarily intended for US and UK weapons programs at that time. However, much if this was used for electricity production.

The development of civil nuclear power stimulated a second wave of exploration activity in the late 1960s. A total of some 60 uranium deposits were identified from the 1950s through to the late 1970s, many by big companies with big budgets.

Since then, only two significant new mines have been found by Kintyre and Beverley Four Mile.

The minor exploration boom 2002-2007 was driven by small companies focused on proving up known deposits.

The Commonwealth Government announced in 1997 that new uranium mining was to proceed commencing with the in 1969 discovered Ranger Project in the Northern Territory, which was sold in 1979 to Energy Resources of Australia (ERA).

The mine opened in 1981, producing 2,800 tonnes per year of uranium, sold to utilities in several countries.

Other discoveries were Naborlek, in 1970 in the same region of Northern Territory, owned by Queensland Mines, and Jabulikam, in 1971.

Naborlek, included in the "three-mines-policy" together with Ranger and Roxby Downs (Olympic Dam), which was delineated in the 1984 ALP National Conference as the only projects from which exports would be permitted, mined a total of 10,858 tonnes of U<sub>3</sub>O<sub>8</sub> and sold to Japan, Finland and France over 1981-1988. Production was ceased in 1988.

## Policy on uranium mining in Australia

Australian Labor Party (ALP) policy on uranium mining has varied over four decades. The 1971 Platform, on which the Whitlan Government was elected in 1972, committed the party to working towards the establishment of a domestic uranium, enrichment and nuclear power sector.

But, after losing government in 1975, pressure grew in the Labor Party for a strong stand against uranium mining and export, as a counterpoint to Liberal Coalition policies to expedite uranium mining and export.

The 1977 ALP National Conference adopted a new policy. Community concerns with the threat of nuclear war were to be allayed by ending uranium mining and ceasing Australia's contribution to the nuclear fuel cycle.

The change committed a future Labor government to declare a moratorium on uranium mining and treatment and to repudiating any commitments in mining.

But, the Commonwealth Government announced in 1977 that new uranium mining was to proceed with the **Ranger project** in the Northern Territory. The mine opened in 1981, producing 2,800 tonnes per year of uranium. Production over three years to end 2002 averaged 3,533 tonnes of uranium per annum.

By the time of the 1982 ALP National Conference, there was concern that the repudiation of contracts would raise issues of sovereign risk and would expose a Labor government to compensation liabilities.

This committed Labor to a policy on uranium mining which was a classic political compromise. The policy was designed to prevent new uranium mines; limit Australia's uranium production with a view to the eventual phasing out of mining all together; and provide moral leadership in ending the nuclear industry.

In the 1983 federal election the ALP won office. The 1984 ALP National Conference then dropped the language of moratorium, repudiation of contracts and phase-out from the Platform.

For the first time the **three-mines-policy** was delineated by naming Naborlek, Ranger and Roxby Downs (Olympic Dam) as the only projects from which exports would be permitted.

Provisional approvals for marketing from other prospective uranium mines were cancelled.

During 1988, Western Mining Corp.'s (now BHP) Olympic Dam project commenced operation.

The naming of specific mines was later deleted from the Labor Platform in the light of the fact that Naborlek ceased production in 1988 and under a Coalition government Beverley started up in 2000.

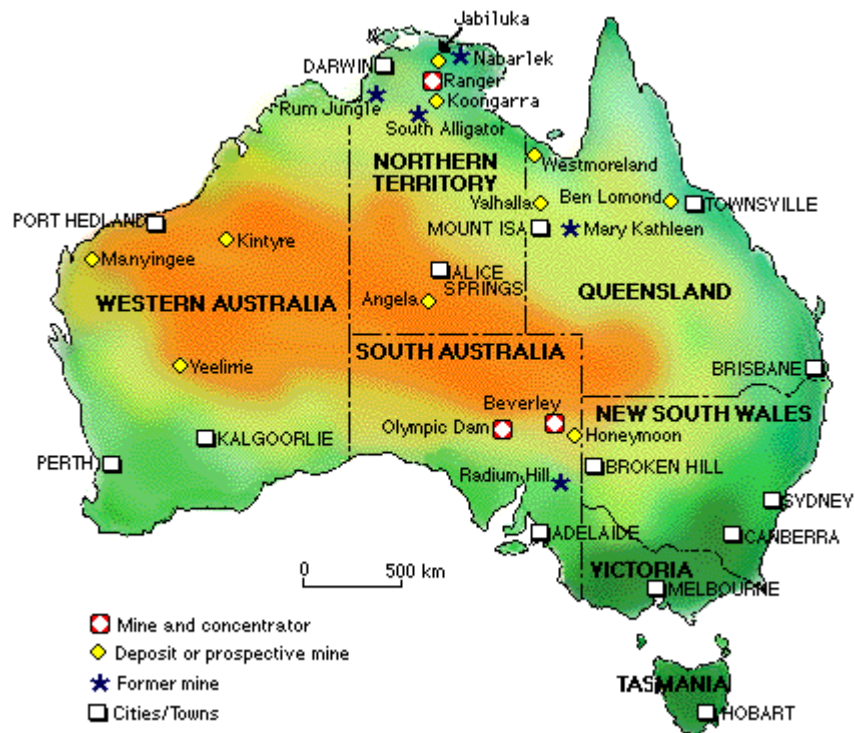
The ALP policy then only allowed exports from existing mines and prevailed the establishment of new ones. This endured through a change of government in 1996 until 2007 when it was abandoned as ineffective and likely to be electorally negative due to changed public opinion arising from global warming concerns.

In **Western Australia**, the replacement of the ALP government in September 2008 by an alliance of the Liberal Party and National Party, resulted in the removal of the ban on uranium mine development.

In **Queensland**, the State Labor Party won the state election of March 2009 with the anti-uranium mining policy remaining in place there.

Since then there have been indications of a change in sentiment in favor of removing the ban at the next state election in March 2012.

## Operating Mines



### ➤ Ranger mine, Northern Territory, owned by ERA, 68.39% owned by Rio Tinto

The Ranger mine and associated town of Jabiru is located about 230 kilometres east of Darwin in the Northern Territory, surrounded by the Kakadu National Park, a major tourist attraction, The mine opened in 1981 at a production rate of approximately 3,300 tonnes of U<sub>3</sub>O<sub>8</sub> per year and has since been expanded to 5,500 tonnes per year capacity.

Mining at the present pit commenced in 1997. Treatment is conventional acid leach. Future development may be underground.

### ➤ Olympic Dam Project, South Australia, owned by BHP Billiton, following its 2005 takeover of WMC Resources

During 1988, the Olympic Dam Project, then a joint venture of Western Mining Corp. and BP Minerals, commenced its operations about 560 km north of Adelaide, in a arid part of the middle South Australia.

The massive deposit is underground, some 350 metres below the surface, and is the largest known uranium ore body in the world. It produces copper, with gold and uranium as by-products.

Annual production capacity for U<sub>3</sub>O<sub>8</sub> has been expanded from 1,800 to 4,600 tonnes U<sub>3</sub>O<sub>8</sub>.

There are plans to greatly increase the mine's size and output by accessing the ore body with a huge open pit, about 4.1 x 3.5 km at 1,000 metres deep.

The plan is to develop a large open pit with associated infrastructure over 11 years and lift uranium production to 19,000 tonnes U<sub>3</sub>O<sub>8</sub> per year.

The open pit will mean that up to 98% of the ore is mined rather than 25% of it.

Most of the uranium will be separated at the mine, but about 2,000 tonnes per year will be exported in copper concentrates, requiring a smelter for these in China or Japan, which is subject to safeguards.

➤ **Beverly mine, South Australia, owned by Heathgate Resources, an associate of General Atomics in the USA**

The small Beverly mine in South Australia started operation late in 2000, 520 kilometres north of Adelaide on the plains north-west of Lake Frome.

It is Australia's first in-situ leach (ISL) mine, accessing a palaeochannel deposit in sand and in saline aquifer. It was licensed to produce 1,180 tonnes of U3O8 (1,000 tones uranium) per year and reached this level in 2004, though production was declined since.

In December 2010, Heathgate received governmental approval to mine the Beverly North deposits, which will maintain production through the Beverly plant.

## Prospective mines

➤ **Honeymoon mine, South Australia, owned by Uranium One, for 51.4% controlled by ARMZ**

The Honeymoon mine in South Australia is in the process of commissioning in 2011. The former owners received government approval to proceed with ISL mine development in November 2011, but reassessed its ore reserves and finally moved to development in 2007.

In 2008, Mitsui of Japan agreed to joint the Honeymoon Project as a 49% Joint Venture partner and a construction contract was then let.

Operation is due to commence in 2011 and ramp up to 400 tonnes U3O8 per year. In 2011, production is expected to be 90 tonnes of U3O8 at \$ 35 per pound – twice the average cost of production in Kazakhstan. Mitsui's A\$ 104 million is largely funding the commissioning.

Early in 2009, a 20% share in Uranium One was taken by three Japanese companies, giving overall 59% Japanese equity in Honeymoon at that time.

In 2010, ARMZ acquired a 51.4 interest in Uranium One valued at \$ 1.52 billion.

➤ **Jabiluka deposit, Northern Territory, owned by ERA (68.4% owned by Rio Tinto)**

The Jabiluka uranium deposit in the Northern Territory was discovered in 1971-1973, 20 kilometres north of the Ranger mine. It is surrounded by the Kakadu National Park but the mine lease area is excluded from the National Park and adjoins the Ranger lease.

It has resources of over 130,000 tonnes of U3O8 and is one of the world's largest high-grade uranium deposits.

A mining lease was granted in 1982, but development was stalled due to disagreements with the Aboriginal traditional owners, then with the Australian Labor Party coming to power at the 1983 federal election. Commonwealth approval was withdrawn and development ceased.

In 1991, ERA, the operator of the adjacent Ranger mine, bought the Jubiluka lease from Pancontinental for A\$ 125 million.

Mining was deferred until agreement could be leased regarding treatment of Jabiluka ore at Ranger mill. ERA will not proceed with the mine until there is agreement from the local Mirror Aboriginal people.



➤ **Four Mile deposit, South Australia, 75% owned by Quasar Resources and 25% free-carried interest held by Alliance Resources**

In May 2008, Quasar Resources, an affiliate of Heathgate Resources, applied for a mining licence for the Four Mile deposit contiguous with the Beverley mine.

Initial production was envisaged at 680 tonnes U3O8 per year from in-situ leach mining, rising to 2,000 tonnes per year by stage 3.

However, the Project is delayed by legal wrangles between the partners, and Alliance is considering setting up its own full treatment plant to produce 2,250 tonnes U3O8 per year.

A scoping study suggests that this would be very competitive with the proposed Heathgate toll treatment.

Alliance reports reserves at 14,000 tonnes U3O8 Indicated resources and 17,700 tonnes Inferred resources.

➤ **Kintyre deposit in Western Australia bought in July 2008 by Cameco (70%) and Mitsubishi (30%) from Rio Tinto for US\$ 495 million**

In September 2010, Cameco said that it envisaged starting mine construction in 2013 and operation in 2015 to produce 2,700 to 3,600 tonnes U3O8 per year for 15 years.

In March 2011, Indicated resources were updated to 25,600 tonnes U3O8 at 0.49% and Inferred resources of 2,400 tonnes at 0.47%.

➤ **Toro Energy is well advanced with its plans to produce 750 tonnes U3O8 per year from its Wiluna Project in Western Australia.**

Wiluna has a current resource of 17,220 tonnes (38 million pounds) of U3O8 contained in 37.10 million tonnes grading 464 ppm U3O8 at a 200 ppm cut-off grade.



➤ **Mega Uranium hopes to start mine construction at Lake Maitland, Western Australia by mid 2011, with a view to producing 750 tonnes U3O8 per year.**

In February 2009, Mega sold 35% of the Lake Maitland Project to Itocho Corp. (10% of Japanese share) and Japan Australia Uranium Resources development Corp. (JAURD – 25% share) for US\$ 49 million.

Lake Maitland has a NI 43-101 compliant Indicated resource of 23.8 million pounds and an Inferred resource of 2.2 million pounds.

The Company's total NI 43-101 complaint resources in Australia contain a total of 43.0 million pounds of U3O8, including resources at Ben Lomond, the Maureen Deposit and Georgetown deposits.

Mega has also uranium interests in Canada and Cameroon.



➤ **Laramide Resources flagship project in Westmoreland in Queensland.**

The Company's 2009 updated NI 43-101 compliant resource totals 51.9 million pounds of U3O8, comprised of 36.0 million pounds Indicated (grading 0.089% U3O8) and 15.9 million pounds Inferred resources (at 0.83% U3O8). Being in its final phase of environmental studies production is possible from 2015.

Laramide has two exploration projects in the US, of which La Jara Mesa in New Mexico has identified a NI 43-101 compliant resource of 10.4 million pounds of U3O8.



➤ **Manhattan Corp.** has a significant Inferred resource of 17 million pounds U<sub>3</sub>O<sub>8</sub> and a further drilled potential of 2.5 to 5.0 million pounds U<sub>3</sub>O<sub>8</sub> already reported for its flagship Double 8 Uranium deposit at Ponton within the Gunbarrel Basin in Western Australia.

➤ **Energy and Minerals Australia** is developing the Mulga Rock polymetallic deposits in Western Australia, with ISL production targeted for 2014 and that from lignite in 2016. The Company has a current 27,100 tonnes Inferred resource for approximately 90% grading 500-600 ppm U<sub>3</sub>O<sub>8</sub> at a 200 ppm cut-off grade.

## AUSTRALIA'S URANIUM DEPOSITS and POTENTIAL MINES

Summary of Known Uranium Resources Available in Major Deposits and Prospective Mines			
Deposit	Grade U <sub>3</sub> O <sub>8</sub>	Contained U <sub>3</sub> O <sub>8</sub>	category
Jabiluka, NT	0.49%	67 700 t	reserves
plus:	0.36%	16 440	measured & indicated resources
	0.53%	57 500	inferred resources
Koongarra, NT	0.8%	14 540 t	reserves
Mt Fitch, NT	0.046%	6 600 t	resources
Angela, NT	0.1%	10 250 t	resources
Bigriyi/ Ngalia, NT	0.082%	12,200 t	indicated & Inferred resources
Nolans Bore, NT	0.02%	3977 t	resources
Napperby, NT	0.036%	3350 t	inferred resources
Kintyre, WA	0.49%	25 600 t	indicated resources
Yeelirrie, WA	0.15%	52 500 t	indicated resources
Mulga Rock, WA	0.055%	27 100 t	inferred resources
Ponton, Double 8, WA	0.031%	7800 t	inferred resources
Nyang, Carley Bore, WA	0.032%	4180 t	inferred resources
Manyingee, WA	0.09%	12 000 t	resources
Oobagooma, WA	0.12%	9950 t	inferred resources
Lake Maitland, WA	0.038%	10 800 t	indicated resources
Lake Way & Centipede, WA	0.055%	11,000 t	ind & inf resources
Dawson-Hinkler Well, WA	0.029%	2800 t	inferred resource
Thatcher Soak, WA	0.029%	4900 t	inferred resources
Honeymoon, SA	0.42m%, 0.24%	2900 t	indicated resources
Billeroo West (Gould Dam), SA	0.045%, 0.33 m%	2 500 t	indicated resources
Beverley Four Mile, SA	0.33%	32 000 t	indicated & inferred resources
Mullaquana, SA	0.275%	10,400 t	inferred resources
Carapateena, SA			unquantified
Prominent Hill, SA	0.012%	9900 t	inferred resources
Mt Gee, SA	0.063%	26,900 t	inferred resources
Crocker Well, SA	0.048%	6 740 t	resources
Curnamona, SA	?	?	
Valhalla, Qld	0.089%	24 765 t	measured & indicated resources
	0.08	5860	inferred resources
Skal, Andersons, Bikini, Watta, Qld	0.06%	12 800 t	inferred resources
Westmoreland, Qld	0.089%	16,000 t	indicated resources
		7000 t	inferred resources
Ben Lomond, Qld	0.27%	3600 t	indicated resources
	0.21%	1250 t	inferred resources

Source: World Nuclear Association

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