



Western Australia's emerging uranium industry

An overview of the uranium projects currently being planned and assessed in Western Australia

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There are currently three mines producing uranium in Australia: the Ranger mine in the Northern Territory and the Olympic Dam and Four Mile operations in South Australia. In Western Australia, there is an emerging uranium industry with several projects well-positioned to commence when market conditions are favourable.

In late 2008, a ban on uranium mining in WA was removed by a newly elected Liberal state government. Since then, two uranium mining projects (Wiluna and Kintyre) have received WA Government and federal environmental approval. Three other uranium mining proposals are in the final stages of environmental assessment and public review. These are the Wiluna Extension, Yeelirrie and Mulga Rock uranium mining projects.

Wiluna Extension project

The Toro Energy Limited Wiluna uranium project was the first uranium project in WA to receive environmental approval in October 2012. The project comprised of the Lake Way and Centipede deposits 15 km and 30 km south of Wiluna. The Wiluna deposits are approximately 500 km north of Kalgoorlie.

Following this, Toro Energy acquired additional resources and extended the project to include the nearby Lake Maitland and Millipede deposits. Mining at Lake Maitland and Millipede is currently being assessed by the WA Environmental Protection Authority (EPA).

The Lake Way, Centipede, Millipede and Lake Maitland deposits contain just over 40 million pounds of U_3O_8 (uranium oxide), primarily as carnotite

mineralisation in calcrete and carbonate hosted near surface deposits. A shallow open pit mine is planned to a maximum depth of ten metres. The Wiluna Extension project has an estimated mine life of 16 years.

Toro Energy plan to construct a central processing plant (previously approved in 2012) at the Centipede deposit and a haul road linking other deposits to the processing plant. Production is forecast at two million pounds of uranium oxide concentrate per annum. Recent successful beneficiation test work has enhanced project economics and process design optimisation work is continuing.

In July 2016, a mining agreement was signed between the traditional owners of the Wiluna area and Toro Energy providing the consent of the native title holders.



Kintyre camp, WA. Image courtesy Cameco Australia.

Kintyre Project

The Kintyre Project is a joint venture between Cameco Australia Pty Ltd (Cameco) and Mitsubishi Development Pty Ltd. It was the second uranium project in WA to receive environmental approval. The project received state approval in March 2015 and federal approval in April 2015.

Kintyre is located on the western edge of the Great Sandy Desert in the East Pilbara region, approximately 1200 km north of Perth. The Kintyre deposit contains around 53.5 million pounds of U₃O₈ based uranium oxide concentrate (UOC). Cameco have advised that further exploration is being undertaken aimed at increasing the resource.

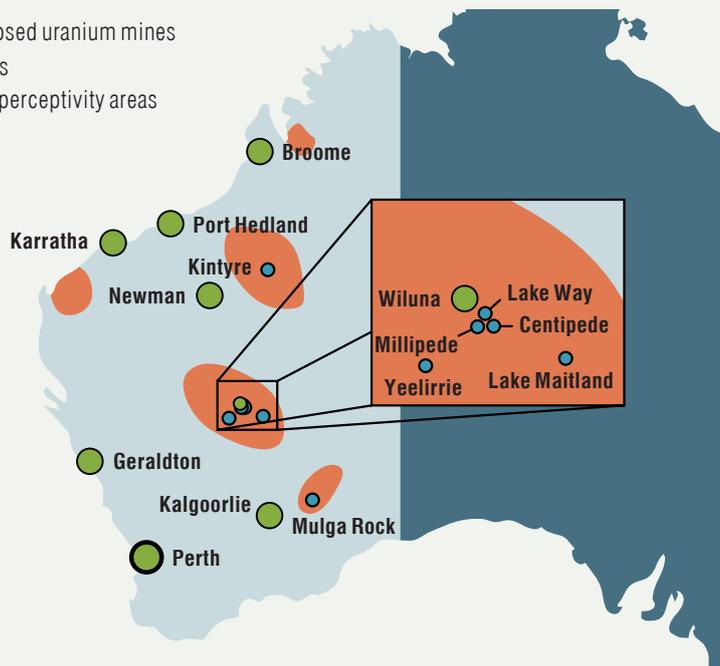
The joint venture project with Mitsubishi Development includes an airstrip, processing plant, waste rock dump, tailings storage facility, accommodation village and a 90 km access road. The single open cut project has an estimated mine life of 12 years.

It is anticipated the project would require a construction workforce of up to 400 employees and an operational workforce of up to 450 employees. Around 30 employees would be based in Perth. An accommodation village of around 250 rooms would be constructed and used during construction and operations.

An Indigenous Land Use Agreement for

Map of proposed uranium projects in Western Australia.

- Proposed uranium mines
- Towns
- High perceptivity areas



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mining operations was signed with the Martu people in 2012. Cameco has advised that the development of Kintyre is subject to favourable market conditions and a development decision by Cameco and Mitsubishi. In 2012, a uranium sales price of around US\$65 per pound was required for the Kintyre project to be economically viable.

Yeelirrie project

The Cameco Yeelirrie deposit, located 70 km south of Wiluna and 660 km northeast of Perth, is the largest known undeveloped uranium resource in Australia. The deposit was discovered by Western Mining Corporation in 1972. In 2005, the deposit was purchased by a subsidiary of BHP Billiton Limited and subsequently sold to Cameco in December 2012. Cameco also purchased the Yeelirrie pastoral lease from BHP.

The Yeelirrie resource contains (measured and indicated) 127 million pounds of U₃O₈ featuring carnotite mineralisation in a carbonate hosted surface deposit. The life-of-mine is estimated to be around 19 years with an

average annual production of approximately eight million pounds of U₃O₈ based UOC. The product would be transported by road from the mine to the Port of Adelaide for export.

The project would employ, on average, a construction workforce of around 500 people with an operational workforce of around 225.

The Yeelirrie project is currently in the final stages of environmental assessment. The WA EPA report, released 3 August 2016, recommended the project not be implemented as eleven species of subterranean fauna located within the project footprint may be threatened with extinction. There is uncertainty regarding the extent of subterranean fauna in the project area. Cameco have released a public statement that acknowledges the complexity and uncertainty involved in assessing subterranean fauna. Cameco have committed to working with agencies and stakeholders to continue to advance the Yeelirrie project through the environmental assessment process.

The WA Minister for Environment will consider the EPA recommendation and, ▶

following the finalisation of the environmental assessment appeals process, make a decision as to whether the project should be implemented. In making this decision, the minister may take into consideration the social and economic benefits of the project. A decision by government is expected by the end of 2016.

Mulga Rock project

The Vimy Resources Limited Mulga Rock project is located 240 km east-north-east of Kalgoorlie. The project consists of four shallow poly-metallic deposits with around 75 million pounds of contained U_3O_8 resource. The deposits of mainly carbonaceous sediments have been oxidised to a depth of 40 metres. The uranium is present as ultra-fine grained uraninite (UO_2) adsorbed onto the carbonaceous material.

The Ambassador, Princess, Emperor and Shogun deposits are distributed over a total length of 30 km. Vimy Resources is proposing to use strip mining techniques similar to that used for mineral sands. Pit voids will be progressively backfilled and rehabilitated.

The Mulga Rock project is also being assessed under the assessment bilateral agreement between the Commonwealth of Australia and Western Australia. The EPA recommendation will help inform government decision makers. Decisions by government for this proposal are expected before the end of 2016.

Government decision-making processes

Decisions by government regarding the environmental acceptability of these proposals are expected late 2016. Approved uranium mining in WA is expected to commence when market conditions improve.

Since the WA Government lifted the ban on uranium mining in late 2008, two uranium mining projects received environmental approval and three other uranium mining proposals are in the final stages of environmental assessment.

Unlike South Australia and the Northern Territory, there is no bipartisan support for uranium mining in Western Australia. The WA Labor Party and the WA Greens are opposed to

Minister for Environment (a total of three months).

Any person can lodge an appeal against the content and recommendations in an EPA report. It is expected that a large number of appeals will be lodged by opponents of uranium mining in an attempt to delay the appeal assessment process and any decisions by the government. The Office of the Appeals Convenor assesses, and where required, investigates appeals and provides advice to the Minister for Environment.

The Office of the Appeals Convenor is aiming to finalise all appeals for uranium mining proposals by the end of November 2016. If this target is met, it should allow the Minister for Environment sufficient time to make decisions before the start of the caretaker period.

Emerging export opportunities

Western Australia is well-positioned to capitalise on the predicted growing demand from Asia for secure uranium supplies.

Collectively, WA uranium mining projects could, in the right market conditions, produce an average of 16 million pounds per annum of uranium oxide concentrate by 2020. About 0.5 million pounds of U_3O_8 UOC is required to keep a large 1000 MWe nuclear power reactor generating electricity for one year.

There is predicted to be a 30 per cent increase in the number of operating nuclear power reactors worldwide over the next decade. These reactors will need a secure supply of uranium. Most of this growth is coming from China and India.

China is committed to increasing the number of reactors from 32 to 97 reactors by 2025. They are committed to achieving climate change targets and reducing atmospheric pollution by replacing brown coal power generation with nuclear power.

India has indicated it will increase the number of reactors from 23 to 34. The recent uranium export agreement between Australia and India provides the protocols and pathway for uranium exports.

Australia exported around 12 million pounds of uranium oxide concentrate in 2014-15 but with additional new supply from WA, this could exceed 20 million pounds by 2025. ⁸

Western Australia is well-positioned to capitalise on the predicted growing demand from Asia for secure uranium supplies.

The project has a life of mine of 17 years with an estimated total production of 50 million pounds. Annual production of three million pounds of UOC is planned. Copper-zinc and nickel-cobalt concentrates will also be produced.

The capital cost estimate for the Mulga Rock processing plant, mining infrastructure and indirect costs is A\$362 million.

The EPA report was released on 15 August 2016. The EPA has concluded that the proposal may be implemented provided this is in accordance with the recommended conditions and procedures. The EPA report is available on the WA EPA website.

uranium mining. However, there are indications that the WA Labor Party will not oppose previously approved uranium mines.

A WA Government election is scheduled for 11 March 2017. The caretaker period for the election is expected to be around the end of January 2017. Decisions regarding uranium mining projects cannot be made during the caretaker period.

Following the release of the EPA reports for a two-week public review period, there is a three-week period for appeals to be collated and an eight-week period for the appeals convenor process to be finalised and advice provided to the