

# The Nuclear Review

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December 2021 | Number 640

Spotlight on Innovation—  
Vimy Resources Limited

News in Review:  
*The Nuclear Industry in 2021*



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### On the Cover

Test pitting and geotechnical investigation trenches at the Ambassador Deposit within Vimy Resources' Mulga Rock Project in Western Australia.

*Photo courtesy of Vimy Resources Limited*

# Spotlight on Innovation— Vimy Resources Limited



Vimy Resources Limited (ASX: VMY | OTCQB: VMRSF) is an Australian-based uranium exploration and development company with interests in Western Australia and the Northern Territory. Vimy's flagship project is the 100 percent-owned Mulga Rock Project located in the Great Victoria Desert of Western Australia. Vimy is also the sole owner and operator of the largest granted uranium exploration package in the prospective Alligator River Uranium District, located in the Northern Territory, where it is exploring for large high-grade uranium unconformity deposits like those found in Saskatchewan's Athabasca Basin in Canada.

In August 2020, Vimy announced results of the Mulga Rock Definitive Feasibility Study (DFS) Refresh, which built on the company's original 2018 DFS. No major adjustments to the mine life or production schedule were reported, which forecast production of 3.5 million pounds  $U_3O_8$  per year for 15 years. However, numerous economic improvements were disclosed in the DFS Refresh. These include a 20 percent reduction in the capital cost of the project to US\$255 million and cash operating (C1) costs over the life-of-mine (LoM) of \$26 per pound  $U_3O_8$ . Vimy also promoted an 8 percent reduction to the All-in Sustaining Cost (AISC) over LoM to \$31 per pound  $U_3O_8$ .

As the next installment in The Nuclear Review's "Spotlight on Innovation" series, this article presents a conversation with Vimy Resources' Executive Director and Interim CEO Steven Michael, which highlights how optimization studies could improve project competitiveness at its flagship asset, the Mulga Rock Project in Western Australia.

## **TNR:** What is the history of Vimy Resources Limited and its various projects?

**Michael:** Vimy was publicly listed in 2008, and until 2017, our sole focus was on the Mulga Rock Project, taking it to a DFS, and building on the excellent work completed by PNC, the Japanese exploration company that discovered the project in the 1980s. More recently, we have been busy advancing the test work, permitting, and approvals and, in fact, have just recently received confirmation of meeting a major development milestone of "substantial commencement."

Taking a step back to 2017, we looked to start building a project pipeline in another project mining jurisdiction within the Northern Territory in Australia. Vimy was ultimately the successful bidder for the ex-Cameco/Rio Tinto joint venture and associated projects located in the prospective Alligator River Uranium Province. These various sites host the highest-grade undeveloped uranium mineral resource in Australia. Our team is actively progressing this asset via metallurgical test work, ore sorting trial, and regional exploration trials.



Steven Michael, Executive Director & Interim CEO, Vimy Resources Limited

## **TNR:** How is the deposit geology at the Mulga Rock Project best described? From a technical perspective, what challenges and opportunities does the geology present, and how does Vimy Resources intend to address these?

**Michael:** The Mulga Rock deposits are found in tributaries of a large paleochannel and hosted by unconsolidated sediments rich in organic matter, under a deep weathering profile. That weathering resulted in uranium and other metals accumulating at a redox boundary with most of the uranium in an ionic state, hence easily leached. Key base metals associated with the uranium mineralization include nickel, cobalt, copper, and zinc.

Being located in the Great Victoria Desert, I would say one challenge that emerged early on was the availability of a nearby water source, needed especially for ore processing. This was quickly overcome as we discovered a very large brackish water resource



a short distance from the project in 2013. While not potable, it is sufficient to support the ion exchange recovery process for uranium and base metals. We have recently embarked on building the pipeline from the water source to the planned location of the processing plant.

Another advantage is the below ground location of the ore body itself. It is relatively shallow at 40-50 meters below surface and is overlain with unconsolidated sediments. This allows for utilization of the proven strip-mining method for removal of the overburden and removal of the ore with no drill and blast. Also, the deep-water table supports in-pit tailings disposal and return of the previously removed overburden. Hence, allowing for pit reclamation as we advance into the different ore zones.

**TNR: What milestone events have defined the history and development of the company's wholly owned Mulga Rock Project?**

**Michael:** This is a question that we address quite often. As a result, we

have developed a timetable with various important accomplishments and milestones, such as project discovery, advancement, approvals, and DFS-related dates. A few others that immediately come to mind are development of the two test pits and subsequent work, as well as the multiple regulatory and mining plan approvals (**Figure 1**).

**TNR: What key lessons did Vimy Resources learn—geologically, metallurgically, and geotechnically—during bulk sampling work and test pitting at the Mulga Rock Project in 2016?**

**Michael:** We feel the test pit and related work was vital in the timetable advancement for Mulga Rock. We indeed had many lessons learned throughout the process.

Geologically, the test pit allowed for further analysis of the uranium resource base, increasing the total resource by over 40 percent to 90.1 million pounds. We were also able to confirm that the grade of base metals proved to be higher than previously evaluated.

Metallurgically, it was determined that the higher-grade components supported a startup with no need for upfront beneficiation. In addition, the sampling process revealed a very clean uranium oxide concentrate with samples delivered, vetted, and passed by conversion facilities operated by Cameco Corp., ConverDyn, and Orano.

Lastly, the geotechnical work challenged our preconception of assumed mining productivity bottlenecks within the overburden. We determined via the test pit process that for overburden removal the free dig process could be efficiently and economically accomplished.

**TNR: In September 2021, Vimy Resources reported positive results from metallurgical optimization testwork concerning an alternative ion exchange resin for its Mulga Rock Project plant circuit. How might this favorably impact uranium recoveries at the Mulga Rock Project, and how might this positively impact capital and operating costs over the life-of-mine (LoM)?**

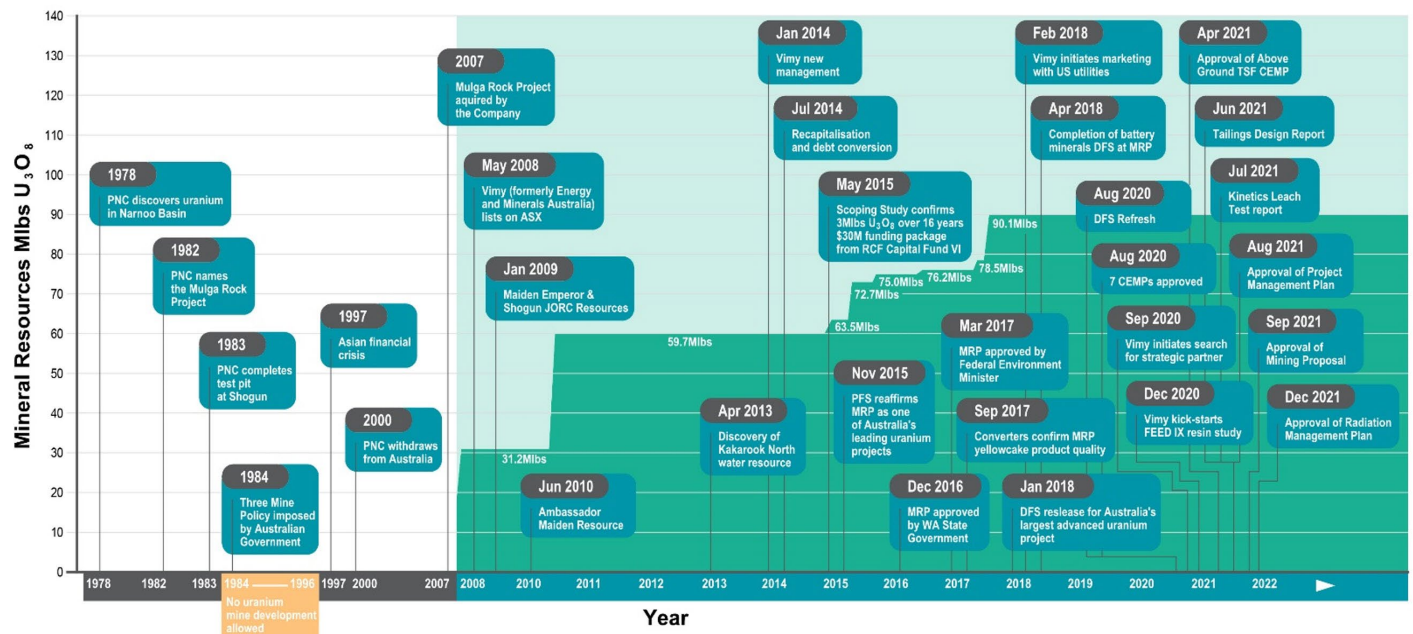


Figure 1 Mulga Rock Project Development Timetable  
Source: Vimy Resources Limited

**Michael:** In 2016-2017, Vimy demonstrated the process flowsheet by conducting two pilot plants and has since sought further optimization.

The use of commercially available Strong Base Anion Ion Exchange resins might deliver an improved bottom line through increased uranium recovery. In addition, capital expenditures and operating costs may be reduced via smaller elution circuits and elimination of a nanofiltration plant and lower reagent consumption.

**TNR: In H1 2021, Vimy Resources reported potential for significant by-product credits arising from an ancillary base metal circuit at the Mulga Rock Project. How have studies regarding the base metal recovery plant progressed through H2 2021?**

**Michael:** The Mulga Rock resource contains a significant amount of associated base metals, including nickel, cobalt, copper, and zinc (**Figure 2**). The significant increase in demand and price of these base metals, associated with the push towards further electrification, especially in the area of electric vehicles and renewable energy battery storage, has renewed our focus on the base metal recovery circuit.

Vimy has reviewed the financial return of base metals concentrates in a Mixed Sulphide Precipitate and will be progressing metallurgical testwork during 2022. We are investigating centrifuge options for the uranium barrens to deliver a tailings wet cake and centrate loaded with base metals. The centrate may be further upgraded via nanofiltration to deliver savings on the base metal recovery circuit capital expenditure.

**TNR: What are the benefits of operating in an established mining jurisdiction such as that in Western Australia?**

**Michael:** The benefits of a world-class jurisdiction like Western Australia include an emphasis on high environmental regulation and safety, a significant qualified workforce, multiple mining-centric research and development centers driven by the world's largest mining companies, and ESG (environmental, social, and governance) factors being front and center of every facet of the sector. We also are pleased to work with and include the local indigenous groups in our Mulga Rock Project processes via open, direct, and ongoing communication.

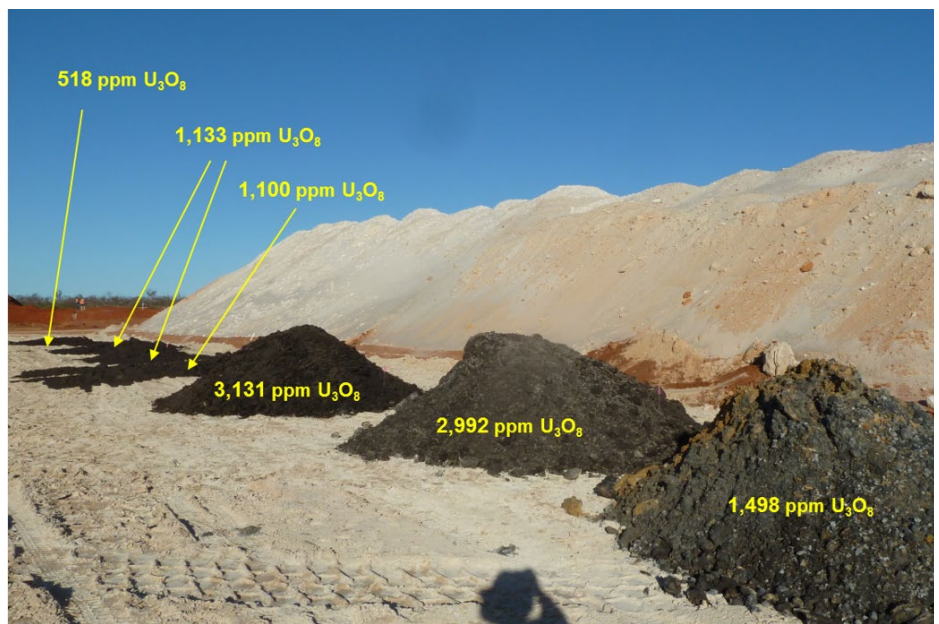
Taking a macro view, Australia continues to support mining as it is an important driver for the nation's economy. Western Australia continues to be an excellent mining destination and was ranked fourth on the Investment Attractiveness Index in the 2020 Fraser Institute Annual Survey of Mining Companies and has

been in the top five each year since 2013.

**TNR: Open-pit operations, such as the proposed Mulga Rock Project, are mass material movement exercises. What strategies does Vimy Resources have in place to manage mine-cost inflation at the proposed Mulga Rock Project?**

**Michael:** Managing mining costs will be an ongoing and continued focus as we will work closely with our contractor partners to look for increased efficiencies and economics. Several targeted areas include investigating further automation of the overburden mining fleet, which we anticipate will deliver superior safety outcomes and operational savings. As industry advances battery-powered vehicles and energy storage, we will evaluate possible future alternatives for a gas power source at the site and transition to an electric mining truck fleet.

As I previously mentioned, we are planning to backfill the overburden as



**Figure 2 Bulk ore sample results derived from the Ambassador Deposit in 2016 represented an integral process toward further de-risking the Mulga Rock Project.**

Source: Vimy Resources Limited



we advance the pit, which will enable us to better manage mine-life costs. The ability to backfill allows for less time and expense for large above-ground stockpiles and will minimize the operating hours of the mining fleet.

**TNR: Supply chain disruption in the wake of COVID-19 travel restrictions is affecting existing uranium producers. Does Vimy Resources have any concerns on delivery schedules for big ticket items required to build the Mulga Rock Project?**

**Michael:** Firstly, the impacts of COVID-19 have and continue to be felt across most areas of business. We strive to protect our workers by following state and federal guidelines, as well as having a company COVID policy in place. The health and safety of our personnel is paramount.

The ongoing effects of the pandemic have had global impacts on supply chain efforts and availability. We will work closely with our various suppliers to maximize delivery planning well in

advance, in an effort to limit interruptions. With the Mulga Rock final investment decision anticipated in late 2022, as well as having a two-year construction period, we hope that COVID-19-related disruptions and supply chain pressures will have largely abated.

That said, Vimy will continue to manage residual pressures by focusing on local sourcing of goods to the extent possible. This includes bigger ticket items such as reagents and consumables. Regional synergies exist for sourcing sulphuric acid to minimize shipment-related risks and working with a local supplier for salt and other related items. Powering the site will be a large cost so we have built into the project model flexibility for on-site power generation, with the potential to include a portion of renewable energy.

**TNR: Is Vimy Resources pursuing opportunities to consolidate human, physical, and economic resources through M&A activity?**

**Michael:** Vimy has actively reviewed projects worldwide over the last four years and did not find any that presented better value than the combination of the Mulga Rock and the Alligator River Projects. We refrained from engaging in dilutive mergers and acquisitions for that reason.

We are currently recruiting people resources to build on the existing management and operations team, when appropriate, by tapping into prior personnel with project-specific IP knowledge. The market for labor is tight, however we believe there is a pool of talented people who will relish the opportunity to be involved in developing Western Australia's first uranium mine and delivering the source of long-term, carbon-free energy around the globe.

**TNR: Innovation is not simply restricted to technology and changes in the way that uranium is physically recovered; it can apply to a company's operating structure, team management, business strategy, and shareholder engagement. What innovations have Vimy Resources implemented to remain competitive and resilient amid challenging market conditions?**

**Michael:** We have embraced innovation as a core value, and applied it from exploration to development, baseline studies, and permitting. Further automation of operations will be a key tool in minimizing our projects' environmental footprint and in controlling widespread costs inflation and operational pressures.

Vimy has undergone significant personnel change over the past



**Figure 3 Excavation Activity at Ambassador North Pit, December 2021. This represents the substantial commencement of on-site works at the Mulga Rock Project.**

Source: Vimy Resources Limited

few months at both the board and management level. This has provided an opportunity for the company to add new people with a wide range of experiences and diverse thinking. Mulga Rock will be of the first new uranium mine development in many years and will be based on modern ESG requirements, including innovation around mining, processing, energy consumption, waste disposal, and rehabilitation (Figure 3).

**Michael:** We are trailblazers in Western Australia and alone in that space (see our Web site for recent announcements to the Australian Stock Exchange: [www.vimyresources.com.au](http://www.vimyresources.com.au)).

*"Vimy Resources has embraced innovation as a core value, and applied it from exploration to development, baseline studies, and permitting. Further automation of operations will be a key tool in minimizing our projects' environmental footprint and in controlling widespread costs inflation and operational pressures."*

concentrates and growing uranium supply concerns. It is the perfect time to be preparing to build a new uranium mine in a favorable mining jurisdiction, with a second project not too far behind. Vimy is focused on becoming one of the next emerging suppliers and continuing to advance our projects towards production.



**TNR: What are the key points that potential investors should know about Vimy Resources today? Any comments regarding the ASX:VMY and OTCQB:VMRSF listings?**

The de-risking of the project achieved through the last 10 years of development activities and the value created along the way will be recognized shortly in the face of increasing need for uranium ore

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