

# THE NORTHERN MINER

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## Plugged in tech-metal juniors

*From graphite to vanadium, high-tech minerals and metals are sure to see growing use in the future from applications such as smart phones, cars and energy storage. Here's a look at a few of the juniors that are getting ready to meet that demand.*



Drillers at Pure Energy Minerals' Clayton Valley lithium project in Nevada.  
Credit: Pure Energy Minerals.



A seam hosting 2% uranium and high-grade vanadium (the black rock) at Western Uranium's past-producing Sunday mine in Colorado.  
Credit: Western Uranium.

### **Avalon Advanced Materials**

Avalon Rare Metals has become **Avalon Advanced Materials** (TSX: AVL), reflecting the junior's focus on lithium and tin-indium.

In preparation for a preliminary economic assessment (PEA) at its Separation Rapids lithium project near Kenora, Ont., Avalon is developing a hydrometallurgical process to make lithium hydroxide for use in lithium ion batteries from petalite.

The junior aims to complete a feasibility study next year. Separation Rapids hosts a historic resource of 10 million tonnes grading 1.4%  $\text{Li}_2\text{O}$ .

Avalon is also working on a PEA at its past-producing East Kemptville tin-indium project near Yarmouth, Nova Scotia.

East Kemptville contains 18.5 million indicated tonnes grading 0.176% tin, 0.17% zinc and 0.064% copper. Inferred resource adds 17 million tonnes grading 0.15% tin, 0.12% zinc and 0.06% copper.

## **Commerce Resources**

**Commerce Resources** (TSXV: CCE) is working on a prefeasibility study for its Ashram rare earth project in northern Quebec's Nunavik region.

In June, the junior received a grant from Quebec's mines ministry and from the Fonds de recherche du Quebec, Nature et technologie, to study and optimize tailings management at Ashram.

The Ashram prefeasibility study will include results from the tailings study, as well as an updated resource.

Measured resources at the project total 1.6 million tonnes grading 1.77% total rare earth oxides (TREO), 28 million indicated tonnes grading 1.9% TREO and 220 million tonnes of 1.88% TREO.

A 2012 PEA estimated that an open-pit mine at Ashram would have a 25-year life and cost \$763 million to build. The study calculated a \$2.3-billion pre-tax net present value and 44% internal rate of return (IRR).

Commerce also holds the Upper Fir tantalum-niobium deposit in British Columbia.

## **Lomiko Metals**

**Lomiko Metals** (TSXV: LMR) is planning a resource update for the La Loutre graphite project in Quebec this summer.

An initial resource released in February pegged indicated resources at La Loutre at 18.4 million indicated tonnes of flake graphite grading 3.19% graphitic carbon. Inferred resources add 16.7 million tonnes grading 3.75% graphitic carbon.

The updated resource will include a high-grade zone that returned up to 28.5 metres of 16.53% graphitic carbon.

Lomiko has a right to earn up to 100% of La Loutre and the nearby Lac des Îles project from Canada Strategic Metals.

In April, Lomiko also acquired the right to earn up to 70% interest in Critical Elements' Bourier lithium project in Quebec.

Lomiko also owns 40% of Graphene Energy Storage Devices.

## **Nemaska Lithium**

Soon to graduate to the TSX, **Nemaska Lithium** (TSXV: NMX) is building a \$38-million first-phase production plant at its Whabouchi spodumene project in Quebec.

The plant, which will produce 500 tonnes of high-purity lithium hydroxide annually using a proprietary process, should be complete before year-end.

The plant will be partly funded by a \$12-million advance payment for Whabouchi product from Johnson Matthey Battery Materials and a \$13-million grant from Sustainable Development Technology Canada.

Nemaska plans to bring a strategic partner on board to help finance the project to commercial production.

The junior expects to start construction of the mine, concentrator and hydromet plant in early 2017, with commercial production starting in the third quarter of 2018.

A recent feasibility study pegged initial capex at Whabouchi at \$549 million, with a \$1.2-billion after-tax NPV, 30.3% IRR and 26-year mine life. Probable reserves stand at 27.3 million tonnes grading 1.53% Li<sub>2</sub>O.

## **Pure Energy Minerals**

**Pure Energy Minerals** (TSXV: PE) expects to release a preliminary economic assessment for its Clayton Valley South lithium brine project in Nevada before year-end.

The company landed a deal last September to supply electric carmaker Tesla with lithium hydroxide for lithium-ion batteries. The five-year supply deal depends on Pure Energy showing the technical and economic viability of Clayton Valley South.

The junior is testing a processing technology that could dramatically speed up production from lithium brines. If test work is positive, it will be included in the PEA, along with an updated resource.

Clayton Valley South hosts inferred resources of 816,000 tonnes lithium carbonate equivalent in five mineralized zones of varying grades and saturated thicknesses.

## **Tantalex Resources**

**Tantalex Resources** (CSE: TTX) is now in the business of supplying tantalum pentoxide sourced by its subsidiary in the Democratic Republic of the Congo, United Materials Congo. In June, United signed a deal with a local mining co-operative to supply technical expertise and equipment in return for exclusive access to local production of tantalum.

Tantalex has already received its first 1,500 kg shipment of Ta<sub>2</sub>O<sub>5</sub> and arranged for buyers. The junior has a phased agreement to acquire prospecting licences in Namibia from Reydev Mining. However no work has been completed on the project in the last year and future work will depend on funding. It's also attempting to renew the licence at its Mayoko tantalum-niobium project in the DRC.

## **Western Uranium**

Earlier this year, **Western Uranium** (CSE: WUC) landed a uranium supply contract with a U.S. utility for delivery beginning in 2018 and lasting through 2022.

The company expects to restart production at its fully permitted Sunday mine complex in Colorado this year.

Western Uranium also has six other past-producing mines in Colorado and Utah.

In addition, through its takeover of Black Range Minerals last year, the company acquired proprietary in situ uranium extraction technology called "ablation."

The junior plans to use the low-cost, environmentally friendly technology at its Sunday Complex and market it to other miners.

The Sunday Complex contains measured and indicated resources of 1 million lb. U<sub>3</sub>O<sub>8</sub> and 6.1 million lb. V<sub>2</sub>O<sub>5</sub> in 203,170 short tons grading 0.25% U<sub>3</sub>O<sub>8</sub> and 1.49% V<sub>2</sub>O<sub>5</sub>. Inferred resources add 264,604 tons at 0.36% U<sub>3</sub>O<sub>8</sub> and 2.16% V<sub>2</sub>O<sub>5</sub>.

## **Zenyatta Ventures**

Responding to requests from potential clients for more graphite samples from its Albany project in northern Ontario, **Zenyatta Ventures** (TSXV: ZEN) is building a pilot plant for the project.

The plant will also help the junior determine the most efficient flow sheet for Albany's ultra high-purity, hydrothermal graphite — information that will be required for an upcoming prefeasibility study.

A PEA last June projected that 30,000 tonnes of high-purity (99.9%) graphite could be produced annually at Albany over a 22-year mine life for an initial capex of US\$412 million. The open-pit mine would have an after-tax NPV of US\$438 million (at a 10% discount rate) and a 24% IRR.

Albany hosts indicated resources of 25.1 million tonnes grading 3.9% graphitic carbon for 977,000 tonnes graphite. Inferred resources add 20.1 million tonnes grading 2.2% graphitic carbon.