

MINING LIFE & EXPLORATION NEWS

Canada's Quarterly Mining Magazine

"Northern Ontario-Quebec Mining Voice"
Promoting interest, understanding and
investment within the mining industry.

SUMMER 2018

PM 40022702



North America Mining Expo



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Sudbury Mining Report

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Electric Vehicle Battery Demand propels future nickel demand



By Frank Giorno

Market analysts for nickel agree that the demand for nickel is growing and stockpiles that caused a glut in 2017 are shrinking – two signs that bode well for the Sudbury mining cluster.

Early signs of a strengthening demand for nickel surfaced last fall in October 2017, when Bloomberg News wrote about the role the electric car battery will play in boosting the demand for nickel. Bloomberg focused on the need for nickel sulphate, a key ingredient in lithium-ion batteries, that could see demand increase 50 percent to 3 million metric tons by 2030.

Nickel sulphate is what Sudbury produces. It is a first class, high grade of nickel and it is the grade of nickel electric car manufacturers need for their batteries.

Saad Rahim, chief economist at Trafigura, said in an interview with Bloomberg, while other battery metals such as cobalt and lithium have more than doubled since the start of 2017, nickel prices had been subdued because of large inventories, but the stockpiles are receding.

“When you look structurally, we should start to get bullish now,” Rahim said. “Are you going to be able to meet that demand when the time comes, given under investment in the supply side?”

Forecasts by Glencore, which operates Sudbury Integrated Nickel Operations, also expect that nickel production will need to increase 1.2 million tons by 2030, equal to more than half of current global output, to keep up with demand from the battery industry.

In November, 2017 Kitco.Com reported increased sales of nickel in the Chinese futures market which shot up in response to similar gains by the London Metal Exchange.

“What we’re seeing is a reaction to a new demand market for nickel in electric cars, first in London, then in Shanghai nickel,” said Amy Li, a metals analyst for National Australia Bank.

Nickel companies globally are repositioning themselves for future demand for nickel in the development of electric car batteries that should peak by 2025 according to metal market ana-

lysts.

In Sudbury, Vale and Glencore, are currently upgrading their mining facilities. Some of the upgrades have been in the works for some time and could be completed at just the right moment as the electric car industry appears to be accelerating towards a share of the vehicles on the road.

Vale and Glencore’s Sudbury Integrated Nickel Operations have received board approval for major mine development projects in the Sudbury Basin. Vale is proceeding with a C\$760 million phase one development of its Copper Cliff Deep project.

Glencore is moving ahead with a \$700 million (US) development of Onaping Depth.

While the recent buzz about nickel use in batteries has captured the imagination of the nickel industry, today’s demand for the metal is still dominated by the production of stainless steel.

Market experts say stainless steel accounts for 70 percent of nickel demand today, while batteries use just 5 percent. In total, global demand for nickel is growing at a healthy rate of 6-7 percent a year. This has been fueled by China’s resurgent boom in stainless steel demand over the past two years which is expected to continue into 2018.

The forecast by the International Nickel Study Group (INSG) are cautiously optimistic about the growth in demand for nickel in 2018.

In early June 2018, the London Metals Exchange reported that nickel stockpiles had shrunk to 278,800 tonnes from where they were almost a year ago when they stood at 389,154 tonnes.

According to the International Stain-

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Vale projects designed to secure its future in the Sudbury Basin

By: Frank Giorno

Vale has faced challenges over the last year, but as the company reported in its May 2018 Report to the Sudbury Community it is confident of its future in Sudbury and that will position it to compete in providing nickel sulphate for electric vehicle batteries and the increasing demand for the stainless-steel market.

“The past year has truly been a time of transformation, and we have a lot of information to share with you about our current operations and plans for the future,” the company stated in its May 2018 Report to the Sudbury

Community.

Last year Vale and other nickel producers experienced a prolonged global downturn in the nickel market. Nickel price volatility, capital requirements, operating cost and productivity issues represent long-term challenges that Vale says it is meeting head on to ensure it continues to operate in Sudbury for years to come.

According to Vale’s Q2 report nickel production from the Sudbury mines reached 13,300 t in 2Q18, 5.0% lower than in 1Q18 and 68.4% higher than in 2Q17. The decrease compared to

1Q18 was mainly due to the strategic decision to increase Sudbury source inventory in advance of the planned 3Q18 scheduled maintenance shutdown. The increase compared to 2Q17 was mainly due to the planned maintenance shutdown conducted in 2Q17 when Sudbury started the transition to a single furnace operation.

As anticipated in the 1Q18 Production and Sales Report, the Coleman mine returned to operation in April 2018 following an unscheduled maintenance shutdown since November

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INSG forecasts increase in nickel usage

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less Steel Forum (ISSF) production is expected to grow in 2018, but at a slower rate. In 2017, world stainless steel melting production reached 48.1 million tonnes in 2017, a 5.8 percent growth year-on-year.

Some of the factors for the growth in 2017 included, Indonesia started producing stainless steel and it will continue to ramp up production. Also, nickel-containing batteries had a positive effect on nickel usage, and this trend is expected to continue.

China’s nickel pig iron (NPI) production recovered in 2017 after a decline in 2016 and is expected to increase further in 2018.

World primary nickel production is projected to increase by the Interna-

tional Nickel Study Group INSG to 2.227 Mt in 2018, continuing an upward swing over the past three years. It was 2.076 Mt in 2017 and 1.989 Mt in 2016.

The INSG forecasts an increase in primary nickel usage to 2.344 Mt in 2018. World primary nickel usage was 2.192 Mt in 2017 and 2.033 Mt in 2016.

INSG recognizes the significant impact of the current financial, economic and political uncertainties on commodity markets in many parts of the world and cautions that future market developments could be affected.

Following the increase in demand and the reduction in nickel stockpiles, prices have also started to rise for nickel. In the first half of 2017, nickel

was selling for an average price of US \$4.43 per pound and but this year into the first week of June nickel prices had climbed to the US \$7 per pound mark last week — a gain of about \$1.50 pound since last December. It has dropped slightly to US \$6.79 as of June 25, 2018.

The Sudbury Basin is still the world’s second-largest nickel sulphide district in the world, and it has advantages over other regions insofar as this deposit is available in a politically stable, mining friendly country like Canada and offers fully integrated — mines, mills, smelters and a refinery. Nickel is widely used in over 300,000 products for consumer, industrial, military, transport/aerospace, marine and architectural applications.



Glencore invests US \$700 M in Sudbury expanding Craig Mine's Onaping Depth

By Frank Giorno

Glencore's Sudbury Integrated Nickel Operation (SINO) has committed itself to nickel production in Sudbury for the next 20 years with a US \$700 million investment in the Craig mine Onaping Depth project.

"The future of Sudbury INO is deep mining and our ability to adapt to it," company officials say in their May 2018 report to the Sudbury community.

"Faced with the reality that existing ore bodies are nearing their end, we have been working on the development of two mine projects - Onaping Depth and Nickel Rim Depth, with the Onaping Depth Project now fully approved for further development."

Currently, Glencore has two underground nickel-copper mines in Sudbury: Nickel Rim South and Fraser. The Nickel Rim South mine is currently Sudbury's largest mining operation. SINO currently employs approximately 1,300 permanent employees and has more than 500 contractors.

Glencore's community report also cites the creation of 8,000 indirect jobs because of its employees purchasing products and services in the Sudbury area. In 2017 the amount of money it spends on total wages and operations by Glencore stands at \$514 Million Canadian.

Onaping Depth is a rich orebody boasting grades of 2.25 per cent nickel and one per cent copper, but

is grades of that value that make the project worth pursuing given the expense of operating at depths of 2.5 kilometres.

2018 will see the start of construction on an internal shaft at the Onaping Depth, followed by underground infrastructure in the years to follow. The internal shaft will extend from 1200L (3,937 ft.) to 2630L (8,628 ft.).

An extensive exploration program identified and defined the Onaping Depth deposit including the Main and South East zones. Glencore has been studying the Onaping Depth between 1999-2012. They have conducted a scoping study, feasibility study and a second scoping study. The assessment of geotechnical risks at depth, heat impacts at depth and global economics prevented full approval of the project until now.

The project includes the construction of a winze from the 1200-metre level laterally off the workings of Craig Mine to access some 14 million tonnes of ore 2,500 metres from surface.

The first 700 metres of the winze will be raise bored down to the 1900-metre level and then slashed and extended beyond that to the 2650-metre level using conventional shaft sinking technology.

The project also includes all off-shaft development and associated ore handling systems. First production from Onaping Depth will occur in 2023 and full production by 2025. Glencore needs the ore to replace declining re-

serves at its Nickel Rim South and Fraser Mines.

Onaping Depth will come in at a time when existing mines are tailing off and this will secure business in Sudbury well into the 2030s which is critical for Glencore's Sudbury Integrated Nickel Operation's future in the Sudbury basin.

Mining at Nickel Rim South is scheduled to cease in 2022 and the Fraser mine in 2024-25.

Electric Car Battery

The Onaping Depth Project, once completed, will extend the mine life until 2035, and provide feed for the Sudbury Mill and Smelter over this same period. It will also be an enabler for additional exploration and development of new mines such as Nickel Rim Depth.

Late 2017 - present Full project approval was received with development continuing to the internal shaft access. Major components such as the hoist were ordered. Detailed engineering was initiated for all aspects of the project.

2018 Will see the excavation of the hoisting plant and start of the internal shaft sinking, along with completion of detailed engineering and continued procurement of required materials for the safe execution of work.

The Onaping Depth operation will be all electric because the costs for ventilation at depths of 1900 (6,233 ft) to 2650 (8,694 ft.) metres would be pro-

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Glencore awarded the John T. Ryan mining and safety award (2017) for Nickel Rim South mine's health and safety achievements

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hibitive.

Glencore is working with equipment manufacturers to develop tunnel-boring machinery for mineral extraction and is confident that technology will develop to help automate drilling and extraction prototypes for hard rock applications.

Until the new technology is developed, Glencore has purchased battery-operated equipment and is testing it at their existing mines, including a 7-tonne scoop, a Maclean bolter, a jumbo and several utility vehicles.

Onaping Depth will be operated in the same way as a modern manufacturing plant with mine-wide Wi-Fi enabling real-time information flow and better decision-making.

In addition to the US\$700 million approved for Onaping Depth, Glencore gave the green light for a US\$140 million upgrade of its Sudbury smelter to meet stricter emission standards, and a US\$450 million investment for its Raglan operation in Northern Quebec.

In addition to its mines, Glencore also operates the Strathcona mill and Sudbury smelter. The company has been mining nickel-copper ores in the Sudbury area of northern Ontario, Canada, since 1928.

The facilities are spread throughout the 60 kilometer-long, oval-shaped geological formation known as the Sudbury basin. Nickel and copper are the primary metals but cobalt and precious metals, such as gold, silver, platinum and palladium are also produced.

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Overall production by Glencore was largely in line with expectations across all its commodity groups.

Glencore's own-sourced nickel production of 30,100 tonnes was 5,100 tonnes (21%) higher than the comparable period, reflecting the continuing stabilisation and ramp-up of Koniambo's processing plant, where both production lines are now operational, and stronger performances at Murrin and SINO.

Integrated Nickel Operations ("INO") own-sourced nickel production of 15,100 tonnes was 1,000 tonnes (7%) higher than the comparable period, reflecting the timing of processing own sourced and third party feeds in the refinery.

Total production including third party material of 21,600 tonnes was down 1,200 tonnes on the comparable period which is within the range of normal expected variations. Own sourced copper production of 10,500 tonnes was 2,400 tonnes (19%) down on the comparable period, reflecting expected declining grades at the Sudbury complex.

Community Involvement

Since SINO has supported community projects totaling \$15 million over the past 10 years. Its five key spending priorities are: health, education and training, environment, locally relevant projects and livelihoods/entrepreneurship.

Glencore supports community projects such as the Falconbridge Community Garden and the Massey Creek Watershed Biodiversity Enhancement Program in partnership with Wahnapi-

tae First Nation..

Over the past ten years, Glencore SINO has signed a total of four partnership agreements with local Indigenous communities. The first, in 2008, was with Wahnapi-tae First Nation. In 2011, a Memorandum of Understanding was signed with Sagamok Anishnawbek First Nation. In December 2015, SINO signed a Memorandum of Understanding (MoU) with the Métis Nation of Ontario. Just recently, a Memorandum of Understanding was signed with Atikameksheng Anishnawbek (Whitefish Lake First Nation).

Health & Safety, Community and Environment

In health and safety, Glencore has been recognized for its record when it was awarded the John T. Ryan mining and safety award in 2017 for its Nickel Rim South mine's health and safety achievements. As well, the Smelter Process Gas Project team received the 2016 Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Project Development Safety Award. Over the last 10 years, Total Recordable Injuries have decreased steadily – a 79% reduction overall.

Glencore's goal is to achieve zero harm in health and safety and the environment.

Glencore has steadily increased its production and it has reduced SO2 emissions by over 90% through investments in technology and process improvements over the past 30 years. The Process Gas Project is a US\$272 million investment and demonstrates Glencore's confidence in Sudbury's long-term future.