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## **Benchmarking Shows Rönnbäcken Performs Better Than Other Nickel Ores**

**IGE Resources AB's (OSE: IGE) subsidiary Nickel Mountain Resources AB is pleased to present the results of EMC's benchmarking analysis of its 100% owned Rönnbäcken Nickel Project in Northern Sweden demonstrating better process performance against other nickel ores worldwide.**

### **HIGHLIGHTS:**

- Rönnbäcken delivers similar or higher rates of nickel recovery despite its low head grade.
- Given its low head grade overall flotation performance of Rönnbäcken is better than that of other nickel ores.
- An absence of iron sulphides avoids dilution of concentrate grade thus allowing a higher level of optimal flotation performance to be achieved.
- The flotation response of the Rönnbäcken samples as measured by the concentration ratio is over 9 times higher than the average of similar nickel ores.
- Rönnbäcken has a high measure of flotation performance with a recovery to head grade ratio almost 5 times higher than the average of similar nickel ores.
- Aspects identified for further mineralogical and processing investigation could increase recoveries by 3-6%.
- A number of areas were highlighted for optimization to reduce capital expenditure and operating costs.

Eurus Mineral Consultants (EMC) was engaged by Nickel Mountain in June 2012 to conduct benchmarking analysis of Rönnbäcken drill core samples against other nickel ores world-wide. Since 1985 EMC has specialised in the simulation, optimisation and design of plant flotation performance from laboratory scale test work. The methodology has been verified over 120 times for a wide variety of ores and circuit configurations. Currently some seven production float plants designed from laboratory flotation tests are in operation and performing as per simulation and many other operating plants have been optimised. The methodology is based on flotation kinetics of mineral and gangue which are the driving forces of flotation performance. EMC reviewed all flotation test data for the Rönnbäcken deposits Vinberget and Rönnbäcknäset and compared their flotation kinetics and performance against a number of nickel ores world-wide. Through this process, the distinctive characteristics of these Rönnbäcken mineralizations are better understood leading to identification of further improvements which may be made.

Rönnbäcken is unusual in that nickel flotation performance during Outotec's mini pilot plant trials at GTK, Finland, was exceptionally good delivering an average sulphide recovery of 75.3% in a high grade concentrate assaying 23.6% nickel despite a low head grade of about 0.128% sulphide nickel (0.18% total nickel). Moreover, the best result achieved was 79.9% recovery at 22.3% nickel. These results were been obtained with only minimal optimisation of process conditions. Furthermore, Rönnbäcken is characterised by trace amounts of the iron sulphides pyrite and pyrrhotite, which is advantageous for generating optimal flotation efficiency. These iron sulphide minerals are common in nickel sulphide deposits world-wide, typically averaging 1.6% and 10.4% respectively, and have a significant diluting effect on concentrate grade because of their similar flotation characteristics to nickel sulphide minerals.

The flotation response of an ore is measured by the concentration ratio which is concentrate grade divided by head grade. Benchmarking against other similar nickel ores world-wide in Canada, Europe, Southern Africa and Australia gives an average head grade of 0.57%Ni, recovery of 72.5% and concentrate grade of 10.5%Ni with a concentration ratio of 18.4. In comparison, Rönnbäcken's concentration ratio is 215.

Another benchmarking metric measuring flotation performance is recovery per percent of head grade. Other nickel ores average 127 whilst Rönnebäcken averages 685. This is similar to values obtained with low grade, mineralogically clean chalcopyrite copper ores, which are known for their high degree of mineral-gangue liberation. The latter is a prerequisite for good flotation performance. Rönnebäcken possesses a similar characteristic.

Based on the benchmarking analysis EMC has identified and recommended further mineralogical and processing aspects to be investigated aimed at optimization of recoveries and improving project economics, including:

- The production of multiple concentrates aimed at increasing recovery by up to 4% exploiting Rönnebäcken's high degree of mineral-gangue liberation (similar to mineralogically clean PGM ores in South Africa where the "two-concentrate" process has improved recovery by up to 4% by manipulating the difference in floatability between slow floating mineral and slow floating gangue).
- Regrinding of cleaner tailings to enhance the differential between slow floating nickel and slow floating gangue.
- Two-stage milling incorporating flash flotation.
- Innovative and production-scale proven classification and flotation technologies such as pneumatic flotation and mechanical classification in the milling circuit, which are expected to reduce unit capital and operating costs, in a high-tonnage environment. Pneumatic flotation is particularly suited to recovering fine liberated mineral and will be tested to treat the 10-15% of nickel in fresh feed to the plant that is currently lost in cleaner tailings as fine, liberated particles of <20µm. Overall recovery is expected to increase by 3-5% (typical from other ores)
- Change reagents and conditions, optimise pH in the cleaners, tailings management and environmental issues.
- Characterise different types of mineralization and explore the impact of mixing of different types of mineralization.
- Develop a geo-metallurgical model.
- Reduce MgO in final concentrate.
- Pilot plant campaigns to test the process and innovative technology.

Founded by Mr. Martyn Hay, EMC offers specialist milling and flotation consulting services to the mining industry world-wide. Since 1985, EMC has specialised in the simulation, optimisation and design of plant flotation performance from laboratory scale test work using its proprietary SUPASIM® flotation simulation program and its extensive database of milling and flotation operations, and laboratory and pilot test data to characterise client ores and predict plant performance. EMC has also developed commercially available software, KinCalc®, for determining flotation kinetics from laboratory and pilot rate test data. The company has produced over 300 reports focussed on platinum group metals, base metal sulphides, pyrite/gold, furnace slag, tailings dams and cassiterite for clients in Australia, Botswana, Brazil, Canada, Finland, South Africa, Spain, Sweden, Zambia, DRC and Zimbabwe

Mr. Martyn Hay, BSc Mineral Processing, MSc Operational Research, has reviewed and approved the content of this press release that relates to work undertaken and results produced by Eurus Mineral Consultants. Mr. Hay is principal and founder of Eurus Mineral Consultants, is a registered Professional Engineer in South Africa and a Fellow of the Southern African Institute of Mining and Metallurgy.

## Forward-Looking Statement

This press release contains or refers to forward-looking information, including statements regarding estimates and/or assumptions about potential mineralization, potential mineral resources as well as assumptions on operational and permit conditions. This information is based on current expectations that involve a number of business risks and uncertainties. Actual results may vary from the forward-looking information contained herein.

The Company provides this information to shareholders and analysts because they are the key drivers of the business. Readers are cautioned that this information may not be appropriate for other reasons. The Company updates its Forward-looking Information as material information becomes available.

Factors that could cause actual results to differ materially from any forward-looking information include, but are not limited to, the possibility that actual circumstances will differ from the estimates and assumptions used in the potential of the Rönnebäcken Nickel Project, the environmental and social cost of proceeding with any of the projects, uncertainty relating to the availability and costs of financing needed in the future, general business and economic conditions, inflation, changes in exchange rates, fluctuations in commodity prices, delays in the development of projects, changes in legislation governing emissions into the air and water, waste, and the impact of future legislation and regulations on expenses, capital expenditures and taxation and other risks involved in the mineral exploration and development industry. When used in this press release, words such as "schedule", "could", "plan", "anticipate", "estimate", "expect", "believe", "intend", "may" and similar expressions are forward-looking information.

The use of the word 'ore' in the text above is a general reference to other ores and does not apply to the Rönnebäcken Nickel Project, which at this present time only consists of mineral resources.

This forward-looking Information represents the views as of the date of this press release. The company anticipates that subsequent events and developments may cause its views to change.

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*IGE Resources AB (publ) is a Scandinavian asset management and development company within natural resources. IGE's portfolio currently consists of several diamond exploration and production assets in Southern Africa and Nickel Mountain Resources AB (publ) owning Scandinavia's largest nickel deposit. IGE is headquartered in Stockholm and its shares are listed on the Oslo Stock Exchange (ticker: IGE). Please refer to [www.ige.se](http://www.ige.se) for more detailed information.*