

# MINING

NORTH OF 60

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Tesla Motors' proposed Gigafactory, a massive facility that aims to produce enough lithium ion batteries annually to power 500,000 electric vehicles, is anticipated to need the equivalent of 100,000 metric tons of mined flake graphite every year. Graphite One believes the quantity and quality of graphite found at its project in western Alaska is on track to meet the needs of the battery powered vehicle industry and the growing demands of the graphite sector in the United States at large. Page 3.

SHANE LASLEY PHOTO

A special supplement to *Petroleum News*

WEEK OF  
September 28, 2014

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• ALASKA

# Gigafactory adds need for Graphite Creek

Graphite One aims to fill increasing demand for graphite driven largely by Tesla Motors' proposed lithium-ion battery facility

By SHANE LASLEY  
Mining News

Will Alaska be home to a “gigamine” that fills explosive future graphite demand expected to be driven by Tesla Motors' lithium-ion battery Gigafactory and the larger market for battery-powered vehicles and devices?

Graphite One Resources hopes the answer is yes.

In early September Tesla announced that Nevada would be the home of the Gigafactory, a massive facility that aims to produce enough lithium ion batteries annually to power 500,000 electric vehicles. For perspective, only about 242,000 pure electric and plug-in hybrid electric vehicles were produced worldwide in 2013.

With this 10-million-square-foot facility, scheduled to begin production in 2017, Tesla hopes to boost the availability of lithium-ion batteries, an important requirement to achieving the innovative company's vision of accelerating the world's transition to electric cars, and drive down the cost of manufacturing the batteries, which will translate to more affordable vehicles for the masses.

“The Gigafactory is an important step in advancing the cause of sustainable transportation and will enable the mass production of compelling electric vehicles for decades to come. Together with Panasonic and other partners, we look forward to realizing the full potential of this project,” said Tesla Motors Chairman and CEO Elon Musk.

While lithium gets top billing in the battery of choice for electric vehicles, there is 10-30 times more graphite than lithium in these power cells.

Experts estimate that when the Gigafactory reaches full capacity, expected by 2020, it will need the equivalent of 100,000 metric tons of mined flake graphite every year.

Roughly 51,000 metric tons of natural graphite was consumed in the United States in 2013, according to numbers published by the United States Geological Survey. Roughly half of which came from China; Mexico, Canada and Brazil round out the other major sources of graphite in recent years.

Tesla's consumption does not take into account the output of other automobile manufacturers that are expanding their EV and HEV lines; nor the plethora of other electrical products that rely on lithium-ion batteries for their operation.

“Clearly, there is a potential significant imbalance between current levels of supply and the projected future demand for graphite, if the Tesla Gigafactory comes on-stream,” said Gareth Hatch, co-



GRAPHITE ONE RESOURCES INC.

The 28 holes drilled at Graphite Creek over the previous two years have encountered high-grade graphite over a distance of three miles (4.8 kilometers). The 2014 program is focused on defining measured and indicated resources over a portion of the deposit with consistent high-grade intervals at surface.

founder of Technology Metals Research.

With one facility set to require nearly twice this entire domestic use, a number of companies with graphite deposits in North America are bustling to position their projects to meet the anticipated explosive demand for this variety of carbon.

Graphite One believes the quantity and quality of graphite found at its project in western Alaska is on track to meet the needs of the battery powered vehicle industry and the growing demands of the graphite sector in the United States at large.

“The Graphite Creek Property hosts the largest known, high-grade, large flake graphite deposit in the United States and North America, and we look forward to continuing to develop marketable graphite products to meet the global graphite demand, which is growing rapidly,” said Graphite One President Anthony Houston.

### Proceed robustly

Situated roughly 40 miles (65 kilometers) north of Nome, Graphite Creek has long been suspected to host between 6 million and 20 million tons of crystalline-flake graphite. This assumption was based on a 100-meter-thick graphite-rich layer that outcrops to the surface for some three miles (five kilometers).

In 2012 and 2013, Graphite One drilled 28 widely spaced holes across this stretch of outcrop, culminating in an inferred resource of 186.9 million metric tons averaging 5.5 percent (10.35 million metric tons) graphite, using a cut-off grade of 3 percent.

This deposit also has near-surface higher grade regions. By increasing the cut-off to 7.0 percent graphitic carbon, an

inferred resource of 37.7 million metric tons averaging 9.2 percent (3.47 million metric tons) graphite has been outlined at the project.

Following the publication of this resource, TRU Group Inc. – a consultant specializing in lithium, rare earths, graphite and other technology materials – laid out some options for developing Graphite Creek.

TRU has a graphite-graphene team with expertise along the entire supply

chain, including environmentally sound and low-cost processing of natural graphite. One of its primary objectives for Graphite Creek is to match the resource to downstream applications.

Taking into account quality and size of the graphite drilled, the consultant suggested a number of downstream products that could be manufactured from Graphite Creek:

Uncoated spherical graphite for use in lithium batteries;

Jumbo flake graphite that can be sold to the refractory industry; and

Expanded graphite, exfoliated and micronized, for use in alkaline batteries.

TRU Group advised Graphite One to proceed “robustly with detailed geological evaluation, attendant test work and the engineering, technical and business studies” at its western Alaska graphite deposit.

“We are pleased to have this report completed by the TRU Group who are known for their industry-leading expertise and roster of experts. We look forward to progressing the Graphite Creek deposit to its full potential,” Houston said.

### Upgrading the resource

With drilling over the past two years proving that Graphite Creek indeed hosts

see GRAPHITE CREEK page 4

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North of 60 Mining News is a monthly supplement of the weekly newspaper, Petroleum News. It will be published in the fourth or fifth week of every month.

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continued from page 3

## GRAPHITE CREEK

a thick slab of graphite rich rock and growing demand for this product on the horizon, Graphite One is focused on outlining a project it can put into production as soon as possible.

To accomplish this objective, Graphite One is investing roughly C\$4 million in a drill program aimed at upgrading a portion of the deposit's massive inferred resource to the higher confidence measured and indicated category. This will allow for the completion of a preliminary economic assessment, a key step in outlining a project for permitting.

"We are anticipating another campaign where we'll continue to develop our existing resource ahead of our PEA with our current drill program," said Huston.

One of the advantages of this deposit is that the majority of the highest grade graphite drilled in 2012 was encountered at the top of the deposit.

"What differentiates us from our peers is all of our high grades sit right at surface," Huston said.

Near-surface, high-grade intercepts include:

- 12GC002 cut 14.3 meters of 10.1 percent graphite starting at a depth of 26.7 meters;

- 12GC004 cut 17.6 meters of 9.36 percent graphite starting at a depth of 20.4 meters;

- 12GCH003 cut 17.1 meters of 11.07 percent graphite starting at a depth of 3.9 meters;

- 12GCH005 cut 54.9 meters of 10 percent graphite starting at a depth of 6.1 meters; and

- 12GCH006 cut 31.7 meters of 10.1 percent graphite starting at a depth of 12.2 meters

The roughly 30 holes slated for this year is focusing on a portion of the deposit that has particularly high concentrations of graphite near the surface.

With an eye on jumping into the graphite market as early as possible, Graphite One has entered into a memorandum of understanding with the Alaska Department of Natural Resources, for engagement with the state's large mine permitting team.

"As we move towards our PEA (preliminary economic assessment) and BFS (bankable feasibility study), this is an

*"Clearly, there is a potential significant imbalance between current levels of supply and the projected future demand for graphite, if the Tesla Gigafactory comes on-stream."*

—Gareth Hatch, co-founder, Technology Metals Research

integral part of the process as we strive to keep our aggressive timeline towards development," Huston commented on the engagement with DNR.

JDS Energy and Mining Inc. is working on high-level engineering and logistics studies for the Graphite Creek project. Results of the studies will be part of a PEA for Graphite Creek due to be published in the second quarter of 2015.

Huston believes the publication of this scoping level study that lays out the details of developing a mine at Graphite Creek will be a watershed moment for the company and the enormous graphite deposit in western Alaska.

"Over the next 12 months there are going to be a lot of changes at Graphite One, which are changes of moving the asset to the next level," Huston told Mining News.

### Spherical graphite

Not all graphite makes a suitable ingredient for lithium-ion batteries. The anodes of these electricity storage cells need a higher form of the carbon known as spherical graphite. This requires that mined graphite be purified to essentially remove 100 percent of other materials and then that the naturally occurring flakes be turned into spheres, which increase the conductivity by increasing the surface area.

"Battery-grade graphite requires very high purity levels, typically (greater than) 99.9 percent carbon-as-graphite. This material also needs to be spheroidized using careful processes that convert the flat graphite flakes into potato-like shapes, which pack much more efficiently into a given space," explained Hatch of Technology Metals Research.

Much of the spherical graphite produced today comes from synthetic graphite, which is produced by superheating powdered petroleum coke, a by-product of oil refining.

Currently, synthetic graphite has beat-

en out the natural form in lithium-ion batteries due to its consistency and greater than 99.9 percent purity.

Synthetic graphite, however, is significantly more expensive to produce than mining and refining its naturally occurring counterpart. And, many believe that mining graphite is more environmentally sound than making it from petroleum coke.

"Vehicles 'fueled' by electricity, especially electricity generated via renewable means, need to be built using as sustainable and environmentally-friendly a supply chain as possible. In the case of batteries for EVs and the graphite required to make them, natural-flake sources are clearly the way to go," said Hatch.

With the goal of producing a product that can compete with the synthetic graphite market and meets the needs of potential end users, metallurgy has been a key focus of Graphite One.

"We are going to be metallurgical work right to bankable feasibility study; and we will be doing it with end-users as well," Huston explained.

In April, the company reported that metallurgical tests on samples from Graphite Creek have returned grades topping 99.9 percent carbon. SGS Canada, which completed the testing, achieved the nearly pure graphite in a two-step process of leaching a flotation concentrate containing 92 percent carbon.

Graphite One's 2014 field program includes the collection of mini-bulk samples from the surface and drill core, which can be used to continue the development and simplification of a process to produce graphite of the purity required for lithium-ion batteries.

"Achieving ultra-high purity carbon results is essential in the emerging graphite market," Huston said. "With accelerated global interest in graphite deposits and with Graphite Creek being the U.S.'s only advanced graphite deposit, we will continue to seek strategic partners, including graphite end-users."

### N.A. graphite field

Despite its attributes, Graphite Creek has competition in being the graphite supplier of choice for Tesla.

"We are meeting with many graphite companies these days, both natural and synthetic," Kurt Kely, the director of battery technology for Tesla Motors, told Mining News in mid-September.

The electric car maker, however, is not ready to divulge details about its search for suitable supplies of the 30,000-40,000 metric tons of spherical graphite experts estimate will be needed each year when the Gigafactory is running at full capacity.

It would take roughly 100,000-140,000 metric tons of natural flake graphite to make the beaded graphite used in these batteries.

Tesla, which has fostered the image of a Made in America, sustainable producer of electric vehicles is tasked with sourcing environmentally responsible materials for the all-important batteries. For this reason, Musk has already indicated that the graphite will be sourced from North America.

Besides Graphite One, at least three other companies – Focus Graphite, Northern Graphite and Mason Graphite – have North American projects that could help supply the Gigafactory and the growing list of other graphite consumers.

Of these, Hatch believes Focus and Northern are best-positioned to meet the initial needs of the proposed Gigafactory.

Focus Graphite Inc. is advancing Lac Knife, a graphite project in Quebec with 9.6 million metric tons of measured and indicated resources averaging 14.77 percent graphitic carbon. A PEA published in November of last year envisions a mine that produces 44,200 metric tons of graphite per year.

Somewhere between 20,000 and 40,000 metric tons of this graphite is committed to an offtake agreement with a group from China.

"On December 19, 2013, Focus Graphite made graphite mining history by securing a 10-year offtake agreement with a Chinese industrial conglomerate for the purchase of up to 40,000 (metric tons) per year of Lac Knife's concentrate production," said Focus President and Chief Operating Officer Don Baxter. "Markets will understand this agreement introduces a new level of stability to our Lac Knife Project just as China announces a halt to graphite production in Shandong Province, effectively putting 20 percent of China's flake graphite production on hold."

Focus completed a feasibility study in August, making it one of the most advanced graphite projects in North America and a potential supplier of about 20 percent of the graphite needed at Tesla's coming battery factory.

Northern Graphite Corp. is studying the potential to develop a similar-size operation, in terms of graphite production, at its Bissett Creek project in Ontario.

In 2012, Northern Graphite published a feasibility study that evaluated a mine that would produce some 20,800 metric tons of graphite per year. The growing demand has prompted the company to study the economics of a mine about twice this size.

In June, Northern Graphite produced a PEA that shows positive economics for an expanded operation that would produce some 44,200 metric tons of graphite per year.

Referring to a list of the world's top graphite projects that includes Graphite Creek, Hatch said, "Any number of these projects potentially has what it takes to become successful graphite mines, especially given the pressure that demand from lithium-ion batteries and other applications might put on the overall supply chain."

Graphite One has its sights on developing its Alaska project into the first one graphite mine on United States soil.

"We intend to be the first graphite project to be in production in the U.S.," Huston said. ●

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• NORTHWEST TERRITORIES

# Incentives spur exploration projects

*Inaugural program aims to encourage existing, would-be mineral explorers to chase diamonds, gold and other metals in the North*

By **ROSE RAGSDALE**  
For Mining News

The Government of Northwest Territories has implemented a new Mining Incentive Program that was over-subscribed by midyear, with strong interest shown by companies and prospectors in the Northwest Territories and across Canada.

“The Mining Incentive Program helps our government support those with the energy, expertise and perseverance that this industry relies on to conduct mineral exploration in an environmentally sustainable way,” said GNWT Industry, Tourism and Investment Minister David Ramsay.

“I especially look forward to using this program to contribute to the success of northern and Aboriginal-owned businesses pursuing mining projects, so more northerners can enjoy the benefits of economic development and a healthy mining sector,” Ramsay said in a statement.



DAVID RAMSAY

“It’s very positive to get that much interest,” said Pam Strand, director of Mineral Resources for the Government of Northwest Territories. “But it’s not surprising when compared with other jurisdictions such as Yukon Territory and Manitoba. Their programs have grown year by year.”

Yukon Territory, for example, awarded C\$1.4 million this year to 44 companies and prospectors, up about C\$630,000 from comparable funding in 2013. Last season, 55 Yukon exploration projects were funded through the program, which represented half of the total number of projects active in the territory in 2013. In addition to leveraging C\$3 million in exploration investment by the private sector, the 2013 funding led to 300 new mineral claims being staked in Yukon and the discovery of 12 new mineral occurrences.

While popular with the industry, the mining incentives are not handouts, Strand said.

“For every dollar we give them, they must spend twice that because it’s so expensive to operate in the North,” she told Mining News in a recent interview.

“Also, (the program) has operating and spending requirements designed to generate additional benefits for the local economy,” she said. “We’re trying to create new mineral discoveries to benefit the ongoing health of the economy and build a healthy junior mining sector. This will

keep projects in the pipeline to ensure the creation of future mines.”

Created under the new NWT Mineral Development Strategy, the mining incentives program is intended to “stimulate and sustain mineral exploration activities throughout the territory and reduce the risk associated with grass roots mineral exploration, exploration that is vital to a healthy, sustained, and productive mining industry.”

Brooke Clements, president of the NWT & Nunavut Chamber of Mines, predicts the program will become an important tool in helping rejuvenate exploration investment in the NWT.

“It’s a very symbolic first step under the new NWT Mineral Development Strategy, which we were pleased to help develop with the GNWT,” Clements said.

Recent regulatory reforms by the Federal Government, the devolution of responsibilities for mining to the NWT Government, and the new NWT Mineral Development Strategy will help the NWT attract more exploration investment.

Clements said a healthy exploration sector is critical to sustain and grow the tremendous benefits mining has created for northern residents and businesses.

The territorial government launched the program in June to provide funds to assist eligible prospectors and mining exploration companies that are already engaged in mining exploration projects or proposing new projects in the NWT. It aims to offset some of the financial risk associated with grassroots mineral exploration in the NWT.

Three prospectors and 11 companies made up the 14 applications that requested a total of over \$1.02 million of funding support. The budget for the program is \$400,000.

Administered by the Northwest Territories Geoscience Office, the incentive program awarded grants ranging from C\$50,000 to C\$80,000 to six exploration companies and split C\$21,500 between two prospectors.

The grant recipients:

Proxima Diamonds Corp., received C\$80,000 for work on the Northern Gem Project in the Tlicho Region. Proxima Diamonds is a new company founded by geologists with extensive exploration and development mining experience throughout North America, with particular experience within the Northwest Territories and Nunavut. The group has been involved with all aspects of diamond exploration since the first Canadian diamond discovery in 1991;

Songful Resources, won C\$65,000 for gold exploration on the Hudex Property

see **INCENTIVE PROGRAM** page 14



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● COLUMN

# Alaska faces exploration spending low

Cash-starved companies invest bare minimums to retain mineral properties, already planning for better times, hopefully, in 2015

By CURT FREEMAN

For Mining News

Although mineral exploration and development activities continue around the state, year-end total expenditures are beginning to gel, and we are getting an increasingly clear picture of just what sort of year it has been for the Alaska mining industry.

For the producing metal mines, gross and net revenue are down over last year, largely due to significant decreases in the spot prices for those metals, with gold down almost 15 percent and silver down almost 25 percent over their peak in the last year. Lead and zinc prices have been somewhat volatile but have risen in recent months so revenue streams there have been mixed. Development activities in 2014 were down relative to 2013 as major producers continue to look for ways to increase productivity, cut costs and improve shareholder value. On the exploration front, Alaska is weathering another year of declining exploration spending, the third straight since record-setting expenditures in 2011. While the following numbers are by no means official, my crystal ball suggests exploration spending for 2014 will be the lowest in 10 years, at somewhere between US\$80 and US\$100 million, and more likely closer to the lower end of that range. Perhaps even more disturbing is the fact that only three projects make up more than 50 percent of the total estimated statewide exploration expenditures. The conclusion is inescapable: most mineral property owners in Alaska have spent little more than the legally required minimum on exploration in 2014. If it is any comfort to you, we are not alone in this dilemma: global financial giant Ernst & Young recently reported that limited gains in productivity have improved access to capital for major companies but smaller producers, companies with near-term development projects, and junior explorers remain cash starved, regardless of the jurisdiction in which their properties are located. SNL Metals & Mining chimed in with supporting evidence, indicating that new mineral

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CURT FREEMAN

resource additions fell almost 50 percent in the second quarter of 2014. With only 75 percent of this year behind us, most companies are already looking to 2015.

## Western Alaska

**GRAPHITE ONE RESOURCES INC.** announced commencement of drilling at its Graphite Creek property. The company plans to conduct infill drilling at approximately 50-meter spaced centers, with the goal being to convert a portion of the industry compliant inferred resource of 284.71 million metric tons at 4.5 percent graphite to the indicated and/or measured category. The resource represents drilling along 4.8 kilometers (three miles) of an 18-kilometer (11 miles) long conductor. The 2014 drilling is designed to continue to demonstrate the continuity of the mineralization both along strike and down dip. The company also plans to collect a small metallurgical bulk sample from both surface exposures and existing drill core. Previous mineral beneficiation tests using a leaching process yielded results exceeding 99.9 percent carbon from a rough concentrate produced from flotation which had an initial 92 percent carbon head grade. Mineralization on the property is characterized by coarse crystalline graphite (greater than 80 mesh) within graphite-bearing schists. In what we hope is a trend toward improving market conditions, the company also

announced that its originally announced \$1 million financing has been increased to \$5 million.

Alaska newcomer **SOUTHERN CROWN MINERALS LTD.** announced acquisition of the Luna-Quicksilver, Kisa and Chilly gold-silver +/- copper projects near Bethel. The company is planning a 1,200-meter drilling program for fall 2014 to follow up ground geophysical surveys completed over 3.75 kilometers of strike on the Luna and Luna East zones earlier in the year. The key Luna-Quicksilver prospect contains two large undrilled outcropping semi-massive sulfide stockwork zones 1.2 kilometers (0.74 mile) distant from each other. The company has budgeted US\$450,000 for its 2014 program, including claim rents, ground magnetics at Luna, helicopter-borne magnetics at Chilly, channel sampling, prospecting at Chilly and Kisa and bedrock drilling at Luna-Quicksilver. Rock chip and channel sampling of Luna stockwork outcrop has returned up to 64.7 grams per metric ton gold and 74 g/t silver. Rock chip and channel sampling of Luna East sulfide outcrop has returned up to 1.2 percent copper and 90 g/t gold. The Luna-Quicksilver quartz-carbonate stockwork veins are hosted in altered sediments and intrusive with anomalous gold, silver, antimony, bismuth, arsenic, molybdenum, tellurium and tin with Luna East also highly anomalous in copper with values up to 1.2 percent. Kisa, drilled with six holes by Gold Crest Mines in 2007, intersected gold in a breccia pipe with best intercept of 126 meters grading 0.65 g/t gold from hole K07-05. Chilly hosts a 500 meter long gold anomaly (>100 parts-per-million gold) with a larger coincident arsenic anomaly (>250 ppm arsenic). Under terms of the deal, Southern Crown Minerals has until December 15 or four months after completion of the drilling, whichever occurs first, to exercise an option to acquire the properties from Afranex Gold Ltd. In addition, Southern Crown must also issue 30 million common shares and pay up to US\$100,000 to Afranex. Welcome to Alaska Southern Crown Minerals Ltd.!

## Alaska Range

**MIRANDA GOLD CORP.** announced an initial resource from historic drilling on the Coleman zone at its Willow Creek project in the Willow Creek District near Anchorage. The new resource includes measured and indicated resources of 62,100 ounces of gold contained in 78,700 metric tons grading 24.6 g/t gold using a cutoff of 7.0 g/t gold. An additional 4,100 ounces of

inferred resources at the same cutoff are contained in 5,300 metric tons grading 24.2.1 g/t gold. The Coleman resource is characterized by a central quartz vein and several subsidiary, sub-parallel shallowly dipping, northwest striking, quartz veins in the hanging wall and footwall that are hosted within a quartz diorite intrusion. The veins intercepted by drilling average less than a meter thick and can be separated by up to 20 meters and tend to merge and splay. Disseminated native gold, tetrahedrite, telluride minerals, pyrite, arsenopyrite and chalcopyrite are the primary metallic minerals in the veins.

**KISKA METALS CORP.** announced that it has entered into a letter agreement with **FIRST QUANTUM MINERALS LTD.** in which the latter is granted an exclusive option to enter into a formal option agreement pursuant to earn up to an 80 percent interest in the Copper Joe project in the Alaska Range. Kiska holds an exclusive right to acquire a 100 percent interest in the mining claims that comprise the Copper Joe project from **KENNECOTT EXPLORATION CO.** First Quantum can earn an initial 51 percent interest in the project by funding expenditures of US\$5,000,000 by December 31, 2017 and can earn an additional 29 percent by approving a decision to construct and operate a mine on the project. Upon the decision to mine, First Quantum has the right to require Kiska to sell its remaining interest (20 percent) to First Quantum and Kiska has the right to require First Quantum to purchase its interest in the joint venture. First Quantum will fund and Kiska will operate an initial 1,500 meter drill program commencing in early September 2014 to test geochemical and geophysical targets. The project hosts a core zone of potassic alteration and A-type porphyry quartz-magnetite veins with chalcopyrite mineralization discontinuously exposed over 1400 meters in creek exposures. This potassic zone is marked by a 1,400 by 600 meter magnetic high anomaly with a coincident resistivity high anomaly likely reflecting secondary magnetite associated with potassic alteration and quartz veining. The core potassic zone is flanked and overlain by a 4.5-kilometer-by-2.5-kilometer (three miles by 1.5 miles) zone of intense phyllic alteration and D-type quartz-pyrite ± molybdenite ± sphalerite ± galena veining identified by surface geological mapping and confirmed by an Induced Polarization geophysical survey. Surface geochemistry suggests that the top of the porphyry system is exposed at surface, and a high-grade core may be preserved at depth.

**WESTMOUNTAIN GOLD, INC.** provided an update on its high-grade Terra project in western Alaska Range. Surface trench work and bulk sampling at the rate of 5 to 10 tons on the Ben and Fish veins has extended the strike length of both veins. The Ben and Fish Vein have been trenched and bulk sample mined to the north and south of their discovery locations with multi-ounce per ton gold values in the veins. Bulk sampling will be continued into the fall with results to be announced later. Current resources at the project, using a

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• COLUMN

# Now is time to exercise your franchise

*Alaska will probably remain a resource development state well into the distant future, and Alaskans need to vote accordingly*

By **J. P. TANGEN**  
For Mining News

All the rhetoric in the world will not be sufficient to mobilize the electorate to get off its collective derriere and fulfill its sacred duty to vote, unless the subject matter strikes a personal chord. I am mindful of the recent plebiscite in the United Kingdom where the question was up or down of whether Scotland should cease to be a part of Great Britain. Well over 80 percent of the eligible voters actually cast their ballots, and in some jurisdictions the vote approached 100 percent. We, in Alaska, should be so lucky; however, Nov. 4 is approaching rapidly, and it is time to consider the consequences of being too busy to vote.

First, there is the hotly contested senatorial race. In the current environment, it is extremely hard to see how the incumbent junior senator can hope to persuade a majority that he should be returned to Washington. He won his first election in the very tiny window between the late Sen. Ted Stevens' conviction and his exoneration of criminal misconduct, and then only by a miniscule vote. His major opponent, although untried in elective office, seems sufficiently qualified to be given a chance.

Next, the present governor stands tall in the field of candidates, primarily because the opposition parties simply are in such a state of disarray that they cannot disambiguate their message beyond being against whatever the other side

## Mining & the law

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J.P. TANGEN

supports.

Of course, the congressman for all Alaska is unimpeachable, so there is little to speak of beyond a quiet sigh. Straight and steady wins the course.

Likewise, with regard to the capitol, notwithstanding the decadal redistricting exercise, it is likely that most of the good hands that have served us well during the last session will be re-anointed, with the help of you, the interested reader.

Alaskans don't have to look too deeply in the rearview mirror to see the reflection of the impossible coalition that transfixed the state senate before 2012.

That brings us to the ballot propositions. Propositions 2, 3, and 4 are, if nothing else, a brief catalogue of why we need to redo the proposition process.

Prop 2 deals with legalization of marijuana, for some ungodly reason. I submit that most of us don't really have much interest in the recreational use of mari-

juana, and that the rest of us can readily get it with only a modest effort. The fact that the proponents of legalization want to invite the entire bureaucracy to meddle in their affairs underscores how little they understand about doing business. My recommendation is that they grow it and blow it without benefit of governmental oversight.

Prop 3 deals with raising the minimum wage. As is typically the case, this is a Trojan Horse kind of concept. Low-wage earners stereotypically are not famous for their voting records or their conscientious involvement in public affairs. Organized labor appears to be financially supporting this proposition; therefore, it is likely that this constituency perceives that it will derive a commensurate reward by its passage. Beware of gifts-bearing Greeks.

Prop 4, of course is the biggie in this field. It calls for legislative approval of certain projects after they are permitted. In other words, after all the regulatory hoops have been jumped through, at no small expense, the People's House would be afforded the opportunity to veto a project. The concepts begs the question, "Why bother?" Regulatory compliance is not perfect, and it may not be comprehensive – I am sure there is an exception to something somewhere; but the Legislature has established the regulatory agencies and charged them with a mission, due primarily to the fact that most legislators don't have in-depth expertise to pass judgment on most so-called sci-

entific standards for most projects. The common sense approach to the regulation of projects is to hire a vast bureaucracy for that purpose and allow it to do the assigned job.

For me, dealing with the several propositions is always an easy "No" vote on all of them, not only the current ones but also every other one that comes along until it is time to consider leaving the kingdom – in that case I'll vote my conscience.

I cannot help thinking about the upcoming election without thinking about the battle for Alaska's Statehood. A significant issue then as now dealt with who will pay the bills. In 1954, then-Gov. Heintzleman proposed that Alaska be a much smaller state than what was subsequently created. Heintzleman's Alaska would not include anything north of the Brooks Range or west of the 152nd Meridian due to the lack of a population base that could support the new state. President Eisenhower was also concerned that Alaska would be vulnerable to Soviet invasion. Somehow these melodies linger on to this present day.

Alaska is a source of global resources. Many of these resources are derived from remote locations, and many more could be; yet we are constantly confronted by those who seemingly don't comprehend this basic fact.

Periodically, we get to cast a ballot on the fundamental issues that affect our lives. Rise to the challenge. Vote for our future on Nov. 4. ●

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## FREEMAN

cut off of 5 g/t gold, includes an indicated resource of 49,809 ounces of gold at 13.25 g/t gold and 112,723 ounces of silver at 29.98 g/t gold and an inferred resource of 369,795 ounces of gold at 15.63 g/t gold and 653,884 ounces of silver at 27.63 g/t gold.

## Southeast Alaska

PURE NICKEL INC. announced results from their 9-hole, 1700-meter drilling program at the North Pole Hill prospect on its Salt Chuck copper-gold-silver-palladium project. Eight of the nine holes encountered pyrite-chalcopyrite mineralization associated with hydrothermal quartz-calcite-epidote veining, similar to that intersected in 2012 drill hole NPH-12-04 which intersected 29.1 g/t gold, 14.1 g/t silver and 0.79 percent copper over 2.58 meters. Best results from the 2014 program came from four step-out holes around NPH-12-04, including hole NPH-14-07 which intersected 14.1 g/t gold and 0.74 percent copper over 0.5 meters apparent width, hole NPH-14-05 which intersected 1.3 g/t gold over 1.1 meters apparent width and NPH-14-10 which intersected 1.3 g/t gold over 1.0 meters apparent width. The results of the 2014 drill program indicate that the property hosts numerous mineralized structures that locally exhibit elevated gold and copper values. These structures may be related to a major fault that bisects the Salt Chuck intrusion in the under-explored central part of the property. ●

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• BRITISH COLUMBIA

# B.C. mine may diversify niobium market

Taseko proposes plans to develop Aley project; further diversifies portfolio with purchase of advanced copper project in Arizona

By SHANE LASLEY

Mining News

Taseko Mines' Aley project in northern British Columbia is one step closer to diversifying the global supply of niobium, a strategic metal that currently is mined almost exclusively in Brazil. In mid-September, the company provided a broad blueprint for developing a mine at Aley that would produce roughly 9,000 metric tons of niobium per year.

In addition to providing a new North American source for niobium, a mine at Aley also would play a role in expanding and diversifying Taseko's operating assets, a key focus of the company.

Taseko President and CEO Russell Hallbauer said, "In 2007, we acquired the Aley project for C\$5.4 million and after only six years and C\$30 million of exploration and development work, we have proven up a project with an C\$860 million net present value. The substantial shareholder value that has been created by this work has yet to be realized in the company's equity. While we advance the project through the environmental assessment phase, we will continue to optimize technical aspects to further improve the economics. The relatively low capital cost, strong operating margins and favorable operating jurisdiction make Aley another ideal growth project for Taseko."

Currently, the Gibraltar copper-molybdenum mine in British Columbia, of which Taseko owns 75 percent, is the only operating asset in Taseko's portfolio. The company has worked to add the New Prosperity Project to this list, but permitting for this copper-gold project in British Columbia has been met with resistance.

Despite the setbacks, Hallbauer believes New Prosperity will live up to its name – both for Taseko and the project's stakeholders in British Columbia.

Taseko is currently awaiting the outcome of a judicial review into a federal government decision to reject the company's proposal to develop a mine at New Prosperity.

A week before laying out plans for



Core from the 2011 drill program at Taseko Mines' Aley project in northern British Columbia. A resource calculated that year outlined 184 million metric tons of measured and indicated resources averaging 0.45 percent niobium pentoxide.

Aley, Taseko reported an agreement to buy Curis Resources Ltd., a company focused on developing the Florence copper project in Arizona.

"The addition of the Florence Copper project to Taseko continues to strengthen the company's near-term development pipeline with an advanced-stage project," said Hallbauer.

## Cash generator

Based on proven and probable reserves of 84 million metric tons averaging 0.5 percent niobium pentoxide (Nb<sub>2</sub>O<sub>5</sub>), Taseko said a 10,000 metric ton per day mine at Aley could produce 9,000 metric tons of niobium per year in the form of ferro-niobium, an important ingredient for niobium alloying of high-strength-low-alloy steel.

The study demonstrating the reserve envisions a standard open pit mine feed-

ing a recovery plant entailing single stage crushing followed by three stage grinding and a multi-stage flotation process to produce a niobium pentoxide concentrate. An on-site converter would further refine this concentrate to ferro-niobium, a salable finished alloy used in making specialty steels.

After intensive metallurgical work the niobium recovery rate for this operation sits at 63 percent, resulting in the production of roughly 216 million kilograms of ferro-niobium over the course of the 24-year mine-life envisioned in the study.

Ferro-niobium delivered to North America is currently fetching roughly US\$50 per kilogram.

Using a long term forecast of US\$45 per kilogram for niobium, the study anticipates a mine at Aley would operate at a margin of US\$21 per kilogram; and achieve a pre-tax net present value (8 percent discount) of roughly C\$860 million;

a pre-tax internal rate of return of 17 percent; and a pay-back period of 5.5 years.

"Aley is expected to generate Canadian dollar revenues of approximately \$400 million per year over its 24-year mine life, and with the anticipated operating margin, contribute significantly to Taseko's cash-flow generating ability," said Hallbauer.

The capital costs to develop such a mine at Aley are estimated to be C\$870 million, including C\$520 million for mine, concentrator and site infrastructure; C\$180 million for the converter, C\$100 million for offsite infrastructure and C\$70 million for pre-stripping.

These expenditures include two years of pre-production activities that involve the construction of an electricity transmission line to Aley; upgrading and extension of current road access and mine site clearing; site infrastructure, processing; tailings starter dam construction; removal and storage of overburden; and pre-production waste development.

The 84 million metric tons of reserves represents less than half of the 184 million metric tons of measured and indicated resources averaging 0.45 percent niobium pentoxide calculated for the deposit in 2011, indicating the potential to significantly expand the proposed 24-year mine. At the time, the measured and indicated resource was estimated to encompass 739 million kilograms of niobium. An additional 323 million kilograms of niobium reported to the inferred resource category.

## Niobium market

The market for niobium is small but growing at a healthy pace.

"The market for niobium continues to grow, year-over-year, at nearly double-digit rates as the demand for specialty steels become increasingly important," Hallbauer said.

According to the United States Geological Survey, Brazil accounted for roughly 90 percent of the 51,000 metric tons of niobium mined worldwide during 2013 – most of the rest of the global supply was mined in Quebec, Canada.

see **NIObIUM PROJECT** page 9

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● YUKON TERRITORY

# Mineral exploration services get a boost

Junior secures option agreement with mid-tier gold producer; throws spotlight on innovations designed for early-stage field work

By ROSE RAGSDALE  
For Mining News

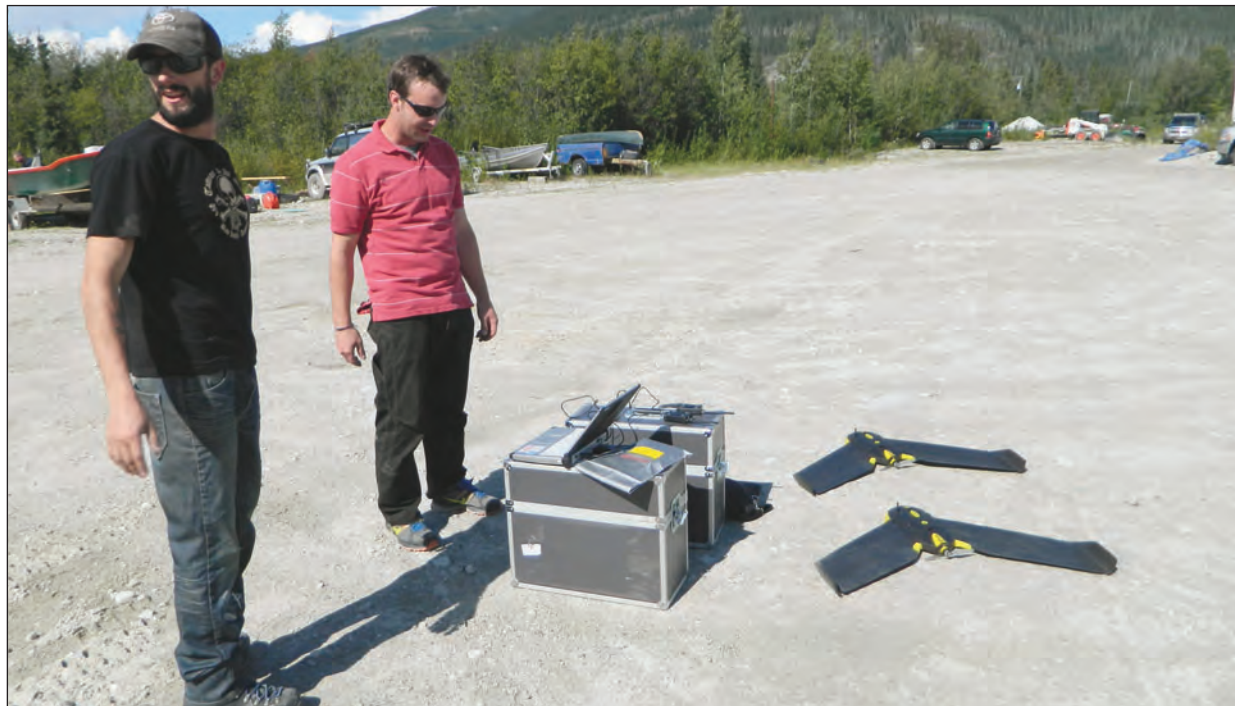
As mineral exploration activity around the globe continues to reel from the body blows delivered by a multi-year capital drought, a trio of innovators in Yukon Territory is giving new meaning to the adage, "One man's meat is another man's poison."

Groundtruth Exploration Ltd., led by Shawn Ryan's protégé, Isaac Fage, is making significant strides in marketing to mining companies a low-cost exploration system that is dependent on several proprietary technologies.

During the 2014 field season, Dawson, YT-based Groundtruth offered its services to several junior mining exploration companies working on mineral projects in Yukon. Pacific Ridge Exploration Ltd. is one of these explorers.

The junior followed up on earlier exploration at the 372-claim King Solomon project, which covers 7,500 hectares (18,533 acres) and hosts one of the largest and strongest gold-in-soil anomalies in the historic Klondike Gold District that has not yet been trenched or drilled.

see **EXPLORATION OPTIONS** page 10



Tao Henderson and Groundtruth Exploration Ltd. President Isaac Fage prepares to demonstrate new features of the company's aerial surveying system called, "The Drone." Groundtruth markets The Drone as a low-cost technique for obtaining detailed and digitized topographic data about mineral exploration and other real properties.

ROSE RAGSDALE

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## NIOBIUM PROJECT

Nearly 80 percent of niobium used as an alloy in specialty steels. As an alloy, niobium improves the toughness, strength, formability, and weldability of specialty steels, such as those used in pipeline construction.

The aerospace industry is another big consumer of niobium, which lends its characteristics to super-alloys used in the construction of jet engines, air-frame systems, liquid rocket thruster nozzles, heat resistance and combustion systems.

According to the USGS, the apparent use of niobium in the United States has increased by roughly 138 percent in five years, from 4,210 metric tons in 2009 to an estimated 10,000 metric tons in 2013.

"The principal market for niobium is in high-strength, low-alloy steels which account for roughly 90 percent of niobium usage. The addition of niobium to these steels improves the strength-to-weight ratio making it ideal for automotive, aerospace, pipeline and shipbuilding applications," Hallbauer said. "As new grades of niobium-containing high-strength steel are developed, demand growth for niobium will out-pace the overall steel market. We also believe that an additional niobium producer will support demand growth by removing some of the risk associated with a tightly controlled market."

Taseko, which is targeting the start of construction in about two years, does not foresee any other players swooping in on the market.

"Aley is not only the highest quality niobium project being developed today, but also the most advanced. The barriers to entry into the niobium market are significant. There are very few known niobium projects around the world and none the scale of Aley. Additionally, the challenges of metallurgy are not insignificant, as evidenced by the three years it has taken Taseko's technical team to achieve the desired recoveries," he explained.

### In-situ copper mine

In addition to becoming a new source for niobium, Taseko is looking to bolster its copper production by finishing what Curis Resources started at the Florence

project in Arizona.

A pre-feasibility study published in 2013 outlines a unique in-situ copper operation that is forecast to produce 75 million pounds of copper per year at an average operation cost of US\$1.11 per pound. It is expected to take about three years to pay back the US\$208 million of initial capital needed.

"There are very few copper projects in secure jurisdictions which have first quartile operating costs, such as Florence, and the timing of anticipated production from the project could be ideal for the next copper price cycle," explains Hallbauer. "Florence's low initial capital costs should allow us to manage the project's funding requirements through to production."

Florence is a shallow porphyry copper deposit that provides the ideal metallurgical, bedrock and groundwater conditions for in-situ copper recovery, a "mining" method that involves a grid of wells injecting a mildly acidic solution into the orebody and pumping out a copper-laden

solution that would produce a pure copper cathode on-site through a solvent extraction-electrowinning process.

The project is in the final stages of permitting a 24-well pilot plant that aims to demonstrate that this modern means of extracting copper without mining works and is safe for the environment.

The purchase of Curis, and in extension the Florence project, is not a stretch for Taseko. Both companies are under the umbrella of Hunter Dickinson Inc. and Hallbauer is the chairman of Curis.

The purchase will be carried out through a share exchange which will involve Curis shareholders receiving 0.438 of a Taseko common share for each Curis common share held, representing consideration of C\$1.055 per Curis share.

The deal is being touted as a win-win for both Curis and Taseko shareholders.

Upon the Sept. 8 announcement of the transaction, Curis President and CEO David Copeland said, "I believe there is an opportunity for shareholders of Curis to

benefit from both retained exposure to our world-class Florence Copper project and from Taseko's operating success at the Gibraltar copper-molybdenum mine. Curis shareholders will be able to participate in a producing company with a more diversified development portfolio stemming from the New Prosperity and Aley projects. Taseko is financially strong and will allow us to forego the future dilution Curis shareholders would have faced to develop Florence on our own."

Taseko shareholders now have two potential new mines to look forward to as the battle to develop New Prosperity continues.

"Florence adds diversity to our pipeline of development projects," said Hallbauer. "With our Aley niobium project also entering the environmental assessment phase, we could potentially have two projects ready for construction in the next 24 months. In an era with few economically viable projects available, we are in an enviable position." ●

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## EXPLORATION OPTIONS

Pacific Ridge holds King Solomon under option from Yukon prospector Shawn Ryan and Wildwood Exploration Inc. as well as 40 adjacent claims held under option from 39242 Yukon Inc. The main target of interest is the King Zone, a 1,600 meters long gold-in-soil geochemical anomaly that lies near the summit of King Solomon Dome. Within this anomaly, gold values range to a maximum of 1,377 parts per billion, or 1.38 grams-per-metric-ton gold, above an anomaly threshold value of 30 ppb gold. The Prince Zone, measuring 600 meters by 800 meters, is located just west of the main target zone.

In 2013, Pacific Ridge conducted a surface exploration program that included the collection of 481 soil samples, followed by high-resolution induced polarization-resistivity surveys and close-spaced GeoProbe® regolith sampling over key soil and geophysical anomalies.

The high-resolution IP survey defined a number of linear structural zones that correlate with the gold-in-soil geochemical anomalies. The regolith sampling, which used the GeoProbe® track-mounted mechanical sampler, penetrated to depths of up to three meters, and sampled rock fragments just above bedrock. Analytical results obtained by the GeoProbe® sampling program include values in the range of 0.1-2.8 g/t gold within the King zone and 2.1-74.5 g/t silver within the King zone SE.

### Attracting an exploration partner

In mid-September Pacific Ridge reported success in attracting an exploration partner for the King Solomon gold project.



Yukon Territory prospector and entrepreneur Shawn Ryan pauses during an inspection of the newly modified GTProbe® mechanical sampler that an increasing number of junior mining companies are employing for early-stage exploration programs in Yukon Territory. The vehicle, assisted by a three-person crew, can obtain up to 57 soil samples per day over 200-300 meters for a fraction of the cost of conventional methods. Ryan is a co-developer of the device.

The junior entered into an agreement to option an interest in the King Solomon project to mid-tier gold producer Centerra Gold Inc. Centerra can earn a 70 percent interest in King Solomon by paying a total of C\$665,000 to Pacific Ridge and/or the underlying property vendors, and completing a minimum of C\$4.5 million in exploration work on the project, in each case by Dec. 31, 2017.

Centerra has indicated that its exploration plans for King Solomon will initially include geological mapping, additional soil sampling, ground geophysical surveying and a RAB (rotary air blast) drilling program.

Much of this work likely will be performed by Groundtruth, which has spent the past year improving its package of exploration services. In addition to the GeoProbe®, recently renamed the

GTProbe® for copyright reasons, the services include The Drone, an aerial system for creating digital elevation photographs that Tao Henderson and Ryan jointly developed, hand-soil sampling, resistivity induced polarization surveys and the bedrock-penetrating RAB drill.

### Fine-tuning services

Thanks to ongoing performance testing and technical refinements, the various components of Groundtruth's exploration package are performing better than ever, Groundtruth President Isaac Fage told Mining News in a recent interview.

The GTProbe®'s designer, Tao Henderson drew on his extensive experience as a remote-controlled aircraft enthusiast to develop a RC wireless communication system for the GTProbe® to eliminate the need for an operator to sit on the

*"The IP works, but it works better with the GTProbe® and the GTProbe® works, but it works better with the RAB drill."*  
—Shawn Ryan, co-owner, Groundtruth Exploration Ltd.

unit, and he designed full hydraulics for the system.

"Knowing the ins and outs of RC wireless helped," he told Mining News in 2013 when the device made its field debut.

It took about six months to design the GTProbe® on the computer and to assemble all of its parts.

"The GTProbe® has more power, a larger engine and it can collect double the number of samples it could last season. Plus, we upgraded it from collecting two-inch (diameter) samples down to nine feet to taking three-inch samples down six feet. It also has a bigger, 27-horsepower engine and increased speed," he explained.

As a result, the GTProbe® can collect an average of 40-45 samples covering 200-300 meters per day, though Groundtruth has set 60 samples as a new daily goal and gotten as much as 57 samples in one day, so far, Fage said.

Henderson has redesigned the body of the machine to make it smaller and lighter and to give it a lower profile.

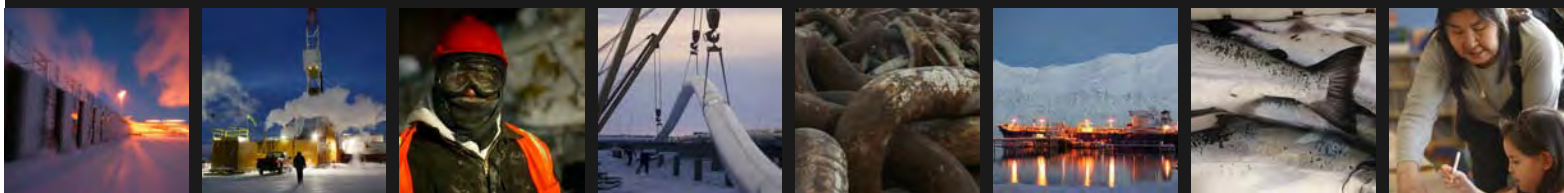
"It's still able to work on 45-degree slopes and we shaved 400 pounds off of its weight. Without tooling, the machine now weighs 2,000 lbs.," Henderson said.

Groundtruth also conducted a winter sampling program with the GTProbe® and found that it was just as fast in the winter as it is in the summer.

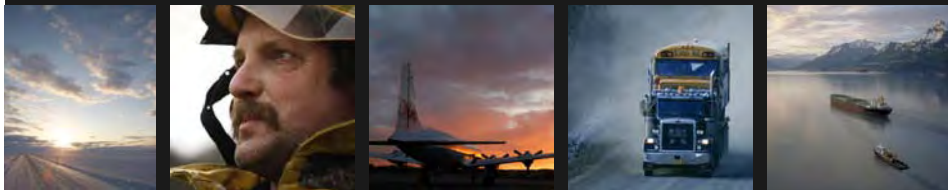
With the RAB drill, the company focused on hitting its target of drilling four

see **EXPLORATION OPTIONS** page 11

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• NORTHWEST TERRITORIES

# First Nations create mineral explorer

100 percent aboriginal-owned mining company assembles promising portfolio of properties, lays groundwork to attract equity partner

By ROSE RAGSDALE  
For Mining News

The Dene First Nations of Northwest Territories has created what is likely Canada's first 100 percent aboriginal-owned exploration and mining company.

Named DemCo Limited Partnership, the startup will celebrate one year in business in October, and is already making its mark in the industry.

DemCo's mission is to enable the Dene to become owners of hardrock mines operating on their own lands. The new company is owned by Denendeh Investments Limited Partnership, which has a membership comprised of First Nations from the five Dene regions of the NWT.

In 2013, it created DemCo and bought up brownfield mineral properties in the Camsell River mining area near Great Bear Lake, NT, with the intent of developing and operating a metal mine.

Aboriginal people in the NWT exert influence on exploration and development activity on more than 350,000 square kilometers of aboriginal-owned lands (surface & subsurface) through settled agreements and ongoing negotiations. Counting Nunavut's lands and NWT traditional territories, aboriginal ownership in the Far North, collectively, spans about 3 million square kilometers (1.16 million square miles), or an area roughly twice the size of Alaska.

Dene territory in Northwest Territories covers an area about one-quarter the size of British Columbia.

Denendeh officials say access to this land mass will give the company a competitive edge that few mining exploration companies are in a position to obtain by virtue of the fact that DemCo is a 100-percent northern Dene-owned company.

Mining is a major economic driver in Canada and the Northwest Territories, spurred by demand for metals overseas. Mining exploration and development has been occurring in the Northwest Territories since the Gold Rush of 1898.

"But the Dene have not really fully participated in the way that they wanted to," Denendeh Investments President and CEO Darrell Beaulieu told a reporter for CIM Magazine last spring.

To create economic self-sufficiency and hope for the

*"We live here, we're based here, we operate here," Beaulieu explained, "whereas people in the past have seen mining companies come from other jurisdictions not really knowing the lay of the land." —Darrell Beaulieu, President and CEO, Denendeh Investments LP*

future, the Dene plan to explore, find, develop and benefit directly from resources on their lands. Resource development would be a vehicle to gain knowledge, capacity and expertise in geology and the mineral sector thus diversifying the NWT and community economies," the company said in a statement on its website.

More than 60 Aboriginal businesses have sprung up within the past decade to service the NWT's mining industry. Existing mines have a finite life-cycle so more producing mines are needed to sustain these Aboriginal service companies.

Training initiatives delivered through the NWT Mine Training Society have trained hundreds of northern people to work in the industry and develop the potential to enter into senior management and entrepreneurial initiatives on their own.

Meanwhile, regulatory uncertainty due to settled agreements, treaty implementation and governance in the NWT has slowed exploration investment.

Dene participation will inspire investor confidence, improve the understanding of the industry and help develop a responsible legislative, policy and regulatory framework that can encourage investment, thus stimulating the economy of the NWT. In terms of education of the industry, it would help to ensure that Aboriginal communities understand the positive and negative impacts of mining and exploration.

"We live here, we're based here, we operate here," Beaulieu explained, "whereas people in the past have seen mining companies come from other jurisdictions not really knowing the lay of the land."

### New era of wealth creation

The limited partnership would release a new era of wealth creation that would not only benefit the Dene,

their partners, and the NWT, but all of Canada, Denendeh Investments said in an October 2013 statement announcing the creation of DemCo.

The partnership would utilize northern and aboriginal business and labor. This would apply in the respective Dene regions where work is performed; if the supply and service is available.

DemCo will create value from a pan-territorial, regional and community perspective by building equity in northern resource development, business development, employment that will induce long term activity, capacity building and benefits rather than immediate and short-term fixes.

The process of acquiring land use permits and licenses has long been an issue for resource developers wanting to invest, develop and operate in the North. Permitting is an issue for which DemCo must develop a strategy. Partnerships with governments, other mining and exploration companies and communities will ensure permitting systems that will work for us and others. As it is the Crown's duty to consult, we must meet with them to develop a partnership in the permitting process that is cost effective and efficient due to the short exploration and construction seasons in the north.

Community consultation methods must be clearly formatted in terms of creating the interest for communities to work with us (communities beneficial interest in our project), a clear meeting format, identifying key Aboriginal resource people and leaders that can influence a positive outcome for the project and to ensure that a permitting process is in place that we can all agree to for project development.

"Timing for creation of DemCo is ideal. The current capital markets are at a low. The credit squeeze has made it almost impossible for many junior mining companies to raise money. As a result, the juniors that are running low on cash have simply stopped doing anything and the ones with cash are being very prudent with it.

Currently, 50 percent of the junior mining companies that are listed have less than C\$500,000 in cash. That is less than an average year of operating costs. Share prices are plummeting as investors have no confidence that the

see **FIRST NATIONS EXPLORER** page 14

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## EXPLORATION OPTIONS

15-meter holes or two 30-meter holes in a day.

"We start with a small compressor and then bring in a bigger compressor and drill farther out," Fage said.

Ryan said the intensive testing is aimed as refining the package of services, from drone mapping to RAB drilling, to cost-effectively compete with a conventional exploration program.

"Helicopter costs are about 30 percent of a season's exploration budget," Ryan said. "We're trying to get that down to 15-20 percent.

Mounted on tracks, both the GTProbe and the RAB drill can move easily through rough terrain and dense overburden. This maneuverability gives it another advantage over larger equipment that must be moved by helicopter.

Each of Groundtruth's innovative services can be marketed separately, especially the Drone. For example, the remote aerial system was dispatched this summer to Mayo, YT to count spawning salmon. In all, the device, along with its all-important remote-sensing software, has flown 400 missions for Groundtruth, Fage said.

But the company's goal is to market its services for grassroots and early-stage exploration together.

"The IP works, but it works better with the GTProbe® and the GTProbe® works,

but it works better with the RAB drill," said Ryan.

"This is the setup before the diamond drill. If someone needs an answer, we can get it for them in two weeks, and all of it can be done for less than C\$100,000 and under the radar of permitting," said Fage.

A full season of Groundtruth's mineral exploration services cost C\$500,000 to C\$700,000.

The company is now training more personnel in preparation for the 2015 exploration season.

"Centerra has bought the full package," Ryan said.

Also, "the majors are interested, and I'm anticipating being able to send a crew to Africa or Turkey," Ryan said. "That's why we've been heavily debugging it. We're also trying to develop training manuals." ●



The RAB (rotary air blast drill) is a third component in the package of services that Groundtruth Exploration Ltd. has designed for early-stage mineral exploration. The relatively lightweight drill can obtain bedrock core samples down to nine meters.



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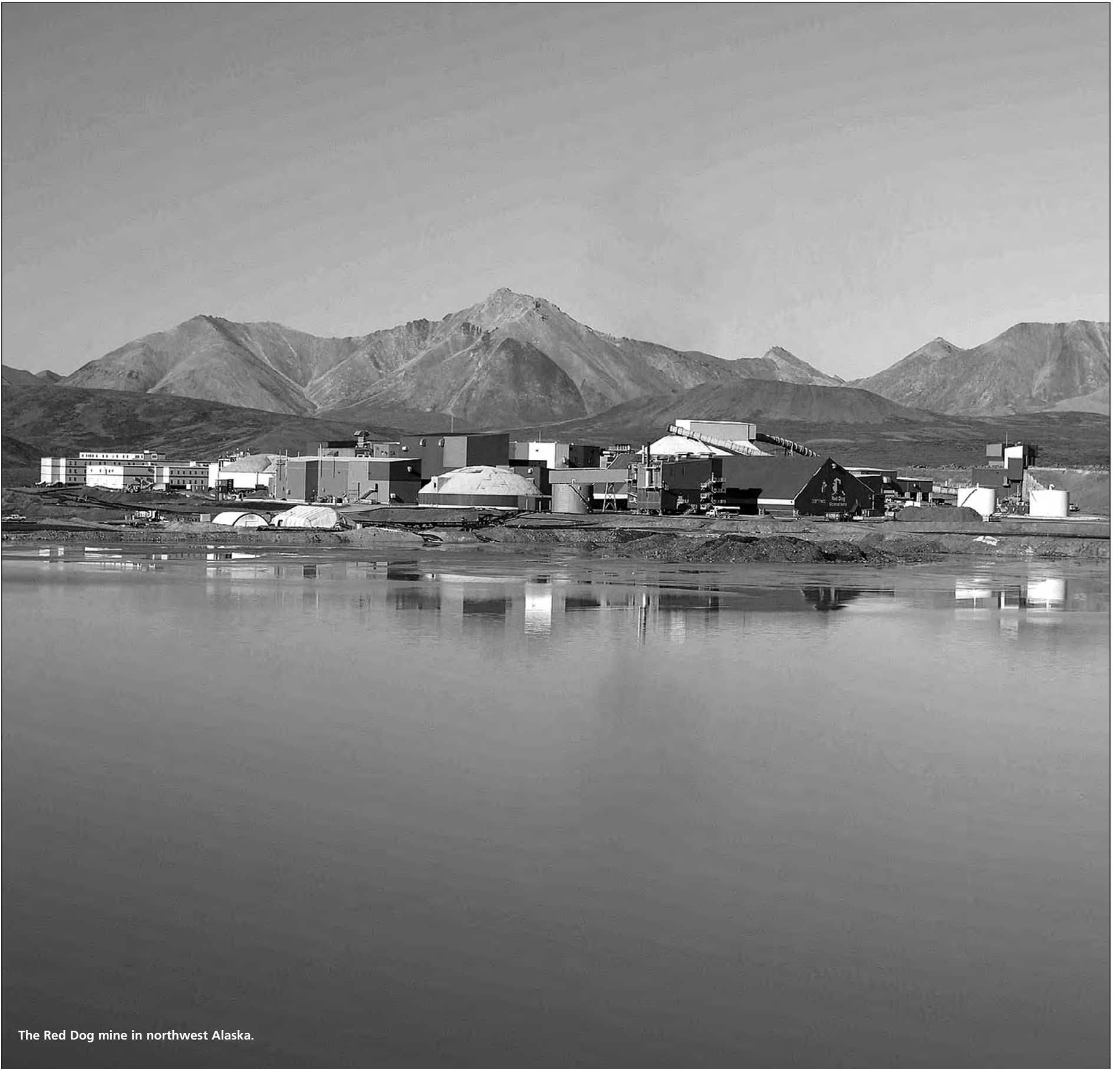
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# NORTH OF 60 MINING

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## NEWS

## DIRECTORY



The Red Dog mine in northwest Alaska.

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Community and Government Relations  
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E-mail: [anna.atchison@kinross.com](mailto:anna.atchison@kinross.com)  
Website: [www.kinross.com](http://www.kinross.com)

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• NORTHWEST TERRITORIES

# Explorers' hunt for diamonds heats up

Major development, exploration advances at Gahcho Kué and Kennady North projects spark new fever in highly prospective region

By ROSE RAGSDALE

For Mining News

Diamonds exploration heated up in the Northwest Territories in 2014 as more and more companies mounted campaigns aimed at identifying the next big discovery in a region that has already produced three operating diamond mines and one well-advanced mine project.

"It's been an exciting season for us because on April 1, we took over management of mineral and oil and gas resources in the territory. Overall, we're seeing a consistent trend for exploration as well as a bit of a resurgence of interest in diamonds," Pam Strand, director of Mineral Resources for the Government of Northwest Territories, told Mining News in a recent interview.

Operators of the territory's three producing diamond mines, Ekati, Diavik and Snap Lake diamond mines, invested substantial funds in ongoing development in 2014.

Dominion Diamonds Corp., which owns and operates the territory's two largest producing diamond mines, Ekati and Diavik, reported exploration expenses of C\$6.8 million incurred during the second quarter of 2014, compared with C\$3.1 million in the comparable quarter of the prior year. Most of this spending went to work on the Jay kimberlite pipe within the Buffer Zone at the Ekati Diamond Mine located 310 kilometers (192 miles) northeast of Yellowknife, NT.

The proposed Jay Pipe Project is expected to enable the continued operation of the Ekati diamond mine, past its current projected mine life of five years. There is significant upside potential to extend Ekati's mine life, if some, or all, of

the mineralization in the Buffer zone is promoted to resource status. The Ekati mine's current annual production is estimated to exceed 7.5 million carats (1,500 kilograms, or 3,307 pounds) of diamonds.

Though DeBeers Canada owns and operates the nearby Snap Lake diamond mine, the global producer's 51 percent interest in the Gahcho Kué diamond project has captured most of its attention and exploration spending in the NWT recently. On Sept. 25, regulators granted De Beers and its 49-percent co-owner, Mountain Province Diamonds Inc, a Type A water license for the project. It and two other key permits obtained in August, pave the way for operator De Beers to begin construction in hopes of meeting a projected start-up date for Gahcho Kué's operations in the third quarter of 2016.

The project has probable reserves totaling 31.3 million metric tons grading 1.57 carats per metric ton for 49 million carats in the Tuzo, 5034 and Hearne kimberlites. A 2010 feasibility study demonstrated that an open-pit operation could produce an average of 4.5 million carats per year over an 11-year period, while employing nearly 700 workers during the peak of construction and roughly 400 mine workers once operational.

"As the world's largest and richest new diamond mine, Gahcho Kué will maintain Canada's position as a leading diamond producer," said Mountain Province CEO Patrick Evans. "Employment created by Gahcho Kué and revenues generated by the mine will contribute to growth and prosperity in the NWT."

## Significant quantities, grades of diamonds

Next door to Gahcho Kué, Kennady Diamonds Inc., a

spin-off from Mountain Province Inc., is exploring the Kennady North Diamond Project located 280 kilometers (174 miles) northeast of Yellowknife. The property host four diamond-bearing kimberlites and more than 40 geophysical targets adjacent to Gahcho Kué.

Management envisions defining a 7 million- to 10 million-metric-ton resource at two carats per metric ton, or more than 14 million carats.

In 2013 Kennady North conducted an extensive exploration program, including lots of surveying and three-dimensional modeling, along with 49 diamond drill holes. In a 2014 winter campaign, the explorer also conducted ground geophysics, including 1,718 line-kilometers of OhmMapper, 262 line-kilometers of ground penetrating radar and 10,172 meters of drilling at Kelvin, Faraday and G6 exploration targets, using three drill rigs.

The junior recovered 25.103 metric tons of kimberlite from Kelvin and 1.07 metric tons from Faraday. After processing, Kennady North reported recovery of 1,014 diamonds from Faraday with a sample grade of 11.22 carats per metric ton and a commercial size grade of 4.32 cpt and recovery of 11,824 diamonds from Kelvin with a sample grade of 5.38 cpt and a commercial size grade of 9.86 cpt.

Kennady North also recovered substantial quantities of diamonds at good sample and commercial-size grades from both Faraday and Kelvin in the spring of 2014

The company conducted 2014 exploration, including 12,000 meters of drilling, high-resolution surface (LIDAR) mapping, delineation and infrastructure upgrades to support an expanded 2015 exploration program. A vertical delin-

see **DIAMOND HUNT** page 15

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## INCENTIVE PROGRAM

in the Sahtu Region. The Hudex property, comprising 16 claims (13,377 hectares or 33,055 acres) is located 116 kilometres (71 miles) northwest of Norman Wells, NT. Prospecting and stream sediment sampling in 2012 and 2013 returned encouraging results;

DemCo Limited Partnership, received C\$65,000 to hunt for multiple metals on the Camsell River Exploration Project in the Sahtu region. The Dene First Nations in the Northwest Territories have created a

100 percent aboriginal-owned company, DemCo LP that can enable them to be owners of mines operating on their lands. DEMCo has acquired 12 mineral claims from Cooper Minerals Inc. covering 9,199 hectares (22,731.18 acres) at the Terra Mine site on the Camsell River at Conjuror bay on Great Bear Lake. The property contains four former producing mines. DEMCo also negotiated the purchase of two other mineral leases and one claim for total control of 9,830 hectares (24,290.11 acres) at the Terra Mine.

Panarc Resources, won C\$64,544 to seek base metals and gold on the Indian

Mountain Lake Property in the Akaitcho Region. The Indian Mountain Lake property is comprised of eight claims (6,298 hectares or 15,562 acres) north of the East Arm of Great Slave Lake;

TerraX Minerals Inc., received C\$50,000 for gold exploration on the Yellowknife City Gold Project in the Akaitcho region. The Yellowknife City Gold Project encompasses about 8,400 hectares (20,756 acres) of contiguous land immediately north of the City of Yellowknife in the Northwest Territories and includes TerraX's 3,562-hectare (8,802 acres) Northbelt property;

North Arrow Minerals Inc., won C\$50,000 to explore for diamonds on the Redemption Diamond Project in the Tlicho region. North Arrow completed an exploration drilling program this year at Redemption, which is located in the Lac de Gras region about 32 kilometers (19 miles) southwest of the Ekati mine. A total of 799.8 meters of drilling tested seven targets in the central part of the property;

Lane Dewar, received C\$12,000 for gold prospecting in the Akaitcho region; and,

Dave Nickerson, won C\$9,500 for gold prospecting in the Akaitcho region). ●

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## FIRST NATIONS EXPLORER

juniors will be able to develop their projects.

"It would be foolish not to acknowledge the impact of the global financial crisis on the mining industry but it also goes to say that markets will come about, senior mining companies will search out and find good deals to snap up juniors who will not survive and more mergers and acquisitions will be the story of the future," according to Denendeh Investments

"The silver lining to present and initiate a Denendeh exploration and mining company at this time may help create momentum for fundamental change in First Nation participation in resources development in the Northwest Territories and Canada," company officials said.

"So the timing to pick up properties and/or junior mining companies is upon us. How long this window will remain open is unknown," they added.

### Past-producer in portfolio

DemCo has three separate initiatives, the Terra silver/IOCG/remediation project, a diamond prospect portfolio and a gold property.

The Terra project is a multi-phase venture, and all aspects of it are very attractive. One phase involves mining high-grade silver, another, IOCG (Iron-Oxide-copper-gold) targets and the third, environmental reclamation.

On the diamond front, DemCo has incorporated "Dene Diamonds Inc." as a wholly owned DemCo subsidiary in the NWT and is progressing to have the trade name registered Canada-wide.

DemCo also has finalized the acquisition of a number of highly prospective diamond claims. These claims include seven known kimberlite pipes once owned by De Beers but relinquished once the De Beers exploration division decided to leave the Northwest Territories.

DemCo said it recently staked a mineral showing known as the Bugow.

"This claim is highly prospective, and it is well known that it has very good gold values. The Bugow is directly north of Behchoko and northwest of Yellowknife. The property has had multiple owners since the 1940s and drilling results to date indicates a current resource of about 233,000 ounces of gold.

DemCo has acquired 12 mineral claims covering 9,199 hectares (22,731.18 acres) at the historic Terra Mine site on the Camsell River at Conjuror Bay on Great Bear Lake from Cooper Minerals Inc. that contains four former producing mines.

The new company also has negotiated the purchase of two other mineral leases and one claim for control of 100 percent 9,830 hectares (24,290.11 acres) at the Terra Mine.

There also is potential for other minerals in the total assembly of leases, which includes the former Smallwood, Northrim, and Norex mines, according to Beaulieu. The claimholder of Norex reportedly was a prospector, geologist and mining engineer who optioned

the property to DemCo and asked to serve as a director of the company.

DemCo is now focused on compiling existing exploration data and using that information to create three-dimensional models.

In June, the fledgling company won a grant a mining incentive grant of C\$65,000 to explore the Camsell River area from the Government of Northwest Territories inaugural mining incentive program.

Denendeh Investments also has raised close to the C\$1 million needed to carry the project through this phase. After the models are complete,

DemCo plans to hit the mining conventions in Yellowknife, Vancouver, and Toronto and begin in earnest to seek out a joint venture partner, whether from Canada or overseas.

### More work ahead

As projects develop in various Dene regions, DemCo said it wishes to establish a working relationship and build an equity partnership base to include regional and/or community businesses.

Create partnerships with the regional entities (either through their respective governing bodies or development corporations), to explore and development the mineral potential in the regions.

Prospector, staking and exploration surveying (E.M., Mag and VLF) training can be initiated to ensure knowledge and experience in the exploration stages, the company added. ●

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## DIAMOND HUNT

ation hole (KDI-14HQ-031a) drilled at the north end of the Kelvin pipe intersected over 161 meters of kimberlite from a downhole depth of about 127 meters.

“This is shallower than previously modeled and indicates the potential for additional tonnage at the high-grade Kelvin pipe,” said Kennady Diamonds CEO Patrick Evans.

The junior also reported the recovery of a high-quality 0.94 carat diamond found during logging of core from the Kelvin kimberlite.

Kennady North expects summer drill results by December and its first NI 43-101 resource estimate for the project by year’s end.

### Activity at earlier-stage projects

Margaret Lake Diamonds Inc. is another junior exploring for diamonds in Northwest Territories. Its efforts are focused on the 23,199-hectare (57,325 acres) Margaret Lake property located 10 kilometers (six miles) from the Gahcho Kué diamond project and within a 90-kilometer by 40-kilometer (56 miles by 25 miles) diamond field that also contains the Snap Lake mine operated by De Beers.

The Margaret Lake property contains several indicator anomalies based on previous work done in the 1990s, and a number of untested kimberlite-like EM and magnetic anomalies. Margaret Lake Diamonds is proceeding with a similar gravity survey and strategy.

Margaret Lake Diamonds also entered into an option agreement recently with Canterra Minerals Corp. whereby Margaret Lake has been granted, subject to the acceptance of the TSX Venture Exchange, the right to acquire up to an aggregate 49 percent right, title and interest in and to Canterra’s 26,000-hectare (64,246-acres) Marlin Property in the Northwest Territories. The property comprises 23 mineral claims covering an area of about 26,000 hectares and lies contiguous to the north and west of the Kennady Diamonds project and west of the Margaret Lake Property. To earn its interest in the Marlin Property, Margaret Lake must make staged cash payments totaling \$100,000, issue an aggregate of 600,000 common shares and incur \$1.75 million in exploration expenditures over a three-year period.

Canterra is the operator, and the initial exploration program, which consists of basal till sampling, is expected to commence immediately.

Canterra President and CEO Randy Turner, commented, “This option agreement with Margaret Lake Diamonds creates an opportunity between two companies that hold contiguous properties to the Gahcho Kué and Kennady North Diamond projects and share a similar geological environment. With the proximal nature of our land packages, the synergies of data collection and, plus the additional capital to advance the Marlin Property expeditiously, we are delighted with this partnership and look forward to a mutually successful outcome.”

Paul Brockington, president and CEO of Margaret Lake, said, “We are pleased to enter into this option agreement with Canterra, as we now have ground under option that surrounds all the northern and western boundaries of the Kennady Diamonds property. We look forward to combining the knowledge base of our two management teams.”

Under the terms of the option agreement, Margaret Lake has the right earn an initial 30 percent interest in the Marlin Property over a two-year period and an additional 19 percent interest in the Marlin property by the

end of the third year.

### Capitalizing on exploration advances

Canterra also conducted a diamond exploration program on other properties in its NWT portfolio this summer. These properties are located in the Southern Slave region, about 220 kilometers (137 miles) northwest of Yellowknife between the Snap Lake mine and the Gahcho Kué project.

The company also recently staked 13 additional claims at the Marlin property (contiguous to the Kennady North Diamond Project) increasing the size of Marlin to roughly 25,838 hectares (63,845 acres) and three additional claims at the Hilltop Property for a total of about 11,064 hectares (27,339 acres). Canterra’s aggregate claim and lease holdings in the Southern Slave now total 74,673 hectares (184,517 acres).

Exploration crews have been mobilized to undertake a detailed basal till sampling program on the Hilltop, King, Marlin, Prism and Gwen properties – each of which hosts indicator mineral trains that comprise chromites, ilmenites and numerous G10 garnets, sourced from within the diamond stability field and which are potentially associated with diamond-bearing kimberlite sources.

Till samples will target areas of interest within these known kimberlite indicator mineral trains as well as geophysical anomalies. It is anticipated that the compilation of this data will identify and prioritize potential drill targets for future programs. This exploration strategy has been designed using a systematic study of the company’s proprietary kimberlite indicator mineral database, as well as detailed geophysical data sets which were compiled over a 15-year time period.

“This exploration season will give the company an opportunity to combine results from previous exploration with the more recently advanced techniques that improve interpretative accuracy and precision,” said Randy Turner, Canterra’s president and CEO.

In describing the renewed interest in diamond exploration, Strand pointed out that Canterra’s Randy Turner is a well-known diamond explorer, who, as the former head of Diamondex, discovered the nearby Snap Lake Diamond Mine, now owned by De Beers.

“As one of only a few explorers with a proven track record of mine discovery and development, we are dedicated to continuing our long history of diamond exploration success and with a recently closed private

placement of C\$2 million, we are well-positioned to achieve our objectives,” Turner said in a recent statement.

### Searching for kimberlite source

North Arrow Minerals Inc. is another junior that completed an exploration drilling program this year in the Northwest Territories. North Arrow’s Redemption Diamond Project is located in the Lac de Gras region, about 32 kilometers (19 miles) southwest of the Ekati mine.

The junior is concentrating its efforts in western Lac de Gras, which is the opposite end of the region from where the operating mines and Gahcho Kué are located.

“Despite many well-defined kimberlite trains in the area, the west end of Lac de Gras has not seen as many kimberlite discoveries,” said North Arrow President Ken Armstrong.

“In particular, we’ve been focusing our work on continuing what Arctic Star had been doing, trying to find the bedrock source for the indicator minerals and kimberlite train at South Coppermine,” he told investors in June.

“We think we’ve identified eight or nine top priority targets that sit right at the end of

the South Coppermine kimberlite train. It is one of the last well-defined kimberlite trains that does not have a bedrock source,” he added.

A total of 799.8 meters of drilling tested seven targets located in the central part of North Arrow’s property near the up-ice termination of the South Coppermine kimberlite train.

None of the drill holes definitively encountered a bedrock kimberlite source for the South Coppermine KIM train. Drill hole 14-RED23-08 (Az. 180 degrees; dip -60 degrees) tested a linear gravity low and encountered predominantly fresh to weakly altered granite that included a moderately strongly fractured fault zone from 89.9 meters to 99.7 meters downhole. This fault zone contained intervals of dull green clay gouge, which have been collected for kimberlite indicator mineral analyses.

North Arrow is exploring the Redemption property under an option agreement with Arctic Star Exploration Corp., in which the company can earn a 55 percent interest by incurring C\$5 million in exploration expenditures prior to July 1, 2017.

Added Strand: “It will be interesting to see what comes out of these projects.” ●



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