ONTARIO EXPLORATION & GEOSCIENCE SYMPOSIUM "A DECADE OF RISKS AND REWARDS"

ABSTRACTS

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MINERAL EXPLORATION AND MINING HIGHLIGHTS, NORTHWESTERN ONTARIO, 2009 John Mason, Mark Smyk, Marc Leroux

Northwestern Ontario was the sight of over 400 exploration programs in 2009; the 4 mining divisions in the NW topped 160,000 active claims at year end.

Gold is the commodity of focus in the NW, followed by copper-nickel-PGE, Cr/Fe, copper-zinc, RM's/REE, and uranium.

Gold production exceeded 1 million ounces from 4 mines: Red Lake Gold Mine(Goldcorp Inc.), Musselwhite Mine (Goldcorp Inc.), Williams Mine (Barrick Gold Corporation) and David Bell Mine (Barrick Gold Corporation).

Gold exploration was undertaken in an intense fashion in: Red Lake, Pickle Lake, Western Wabigoon, Greenstone, and the north shore.

Other 2009 mineral deposit targets included: Cr/Fe, proterozoic magmatic Cu-Ni-PGE, and lithium.

Rainy River Gold Project – Richardson Twp. Ontario, Canada

Paul Geddes – Senior Geologist, Rainy River Resources Ltd

The Rainy River Gold Project is located in an extensively glaciated and till covered portion of Richardson Twp. in Northwestern Ontario. The Company is currently very active in this essentially unexplored Archean greenstone belt and has defined in seven zones both open pittable and underground amenable gold resources of 2.2 Moz (indicated) and 1.8 Moz (inferred). Additionally, the deposit contains significant silver credits of 3.4 Moz (indicated) and 4.5 Moz (inferred).

The Archean Rainy River greenstone belt (~2800 Ma) forms part of the Wabigoon Subprovince in Northwestern Ontario. In Richardson Twp, the seven known low sulphide gold zones are hosted within a greenschist facies, bimodal submarine succession of felsic to intermediate volcaniclastics with minor pillowed mafic flows and lesser clastic sediments possibly indicative of a primary collapsed caldera.

Gold mineralization within the stratabound zones appears syngenetic and a disseminated base metal (Zn, Cu) halo suggests an exhalative, volcanic-hosted environment as opposed to structurally controlled mineralization. Gold bearing intervals are characterized by intensely sericitized and variably chloritized dacitic volcaniclastics typically containing less than 10 modal percent disseminated pyrite. What may be interpreted as structurally controlled, late stage remobilization has resulted in a second population of high grade gold values associated with quartz-carbonate veining.

A near surface, high grade Ni-Cu-PGE zone (the 34 Zone) has been defined over a strike length of ~350m and occurs in a fault bounded mafic to ultramafic dike that post-dates the Proterozoic diabase dikes in the region. This magmatic hosted mineralization

cross cuts the eastern portion of the gold bearing stratigraphy. The primary source of this magmatic sulphide mineralization has not yet been determined.

Exploring in an extensively till covered area is not without its technical challenges. Having recognized these difficulties, the Ontario Geological Survey undertook a till sampling program in 1988 utilizing reverse circulation drilling and trenching with the aim of generating exploration interest in the area. As a result of the $400,000 investment, the program was successful in outlining one of the largest recorded gold in till anomalies, with numerous and significant bedrock gold occurrences, centred in Richardson Twp.

A staking rush ensued shortly after the data was made public, and Nuinsco Resources Ltd. became the majority landholder in the belt. In 2004, Rainy River Resources Ltd. purchased 100% of the project from Nuinsco and has dramatically increased the gold resources.

Adding to the gold resource in a cost effective manner in this often challenging setting has prompted the company to rely on less conventional exploration tools. Reverse circulation overburden drilling has proven to be extremely effective in not only discovering but also defining the surficial limits of gold zones where they are exposed at the bedrock-till contact. Although conventional airborne and ground-based geophysical surveys have not yet quantitatively defined the geophysical signature of the deposit, detailed gradient magnetic surveys, ground-based gravity, magnetotellurics and large array induced polarization surveys have produced meaningful results that correlate very well with the known geology and mineralization.

Three dimensional modelling of the deposit has taken on a new dimension in that quantitative analysis of borehole magnetic susceptibility data, oriented drill core and optical-acoustic televiewer data has been incorporated into the digital database. Most importantly, in excess of 70,000 ICP and whole rock analyses are employed in three dimensional space and have been instrumental in not only quantifying the styles and degrees of alteration but also defining structural patterns that would have otherwise gone unnoticed with subjective, semi-quantitative borehole lithology data.

Overall, the appropriate incorporation and exploitation of all available drillhole, geochemical and geophysical data has allowed Rainy River Resources to drastically increase its knowledge base and hence the geological understanding of an area that is essentially devoid of outcrop exposure. With only ten percent of its land holdings explored to date, Rainy River Resources is endeavouring to define Canada`s next gold camp.

Industry collaborations at Lakehead University; Advancing mineral deposit research

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The faculty and students of the Geology Department of Lakehead University are involved in a wide range of mineral deposit studies both in Northern Ontario and overseas. The majority of these research projects are supported by, and undertaken in close cooperation with, industry partners and government partners. This talk will highlight the projects undertaken by the Department of Geology and discuss the various methods of funding available to support mineral deposit research. Researchers maintain a strong focus on gold deposits including the Williams and Musselwhite mines, but are also investigating VMS, IOCG, diamond and porphyry copper styles of mineralization.

ADVANCING CANADA'S NEXT MAJOR GOLD CAMP

The Kenora District, covering more than 68,000 km^2, was historically the centre of gold mining in Ontario, accounting for more than 55% of the province's gold production. Gold was discovered in the Lake of Woods area in 1878 and by the early 1900s several gold mines were in production. However, by 1909, the exodus of gold miners had begun in favour of gold rushes in Timmins and Kirkland Lake and by 1912 economic conditions in the Kenora District had forced the closure of many of the mines. Although gold mining resumed in the 1930s, by 1943 most gold mining had ceased due to war-time conditions and since then only small amounts of gold have been produced, mainly as a by-product or from tailings cleanup projects. In total, the Kenora District has only produced an estimated 250,000 ounces of gold, which pales in comparison to other greenstone belts in Ontario with which the geology of the Kenora District shares many similar and prospective characteristics.

The Goliath Gold Project, which includes the Thunder Lake Gold deposit, is the flagship project of Treasury Metals Inc. (TSX:TML), located alongside the Trans-Canada Highway about 20 kilometres east of the City of Dryden. Treasury Metals purchased the Property from Teck Resources Ltd. (Teck) and Corona Gold Corporation (Corona) in 2008. The area of the Goliath Gold Project was investigated in 1989 by Teck as part of their Quest Project (search for Hemlo-type mineralization). Their reconnaissance work outlined an extensive area of alteration with associated gold concentrations extending over 3,000 metres in strike length. The alteration zone was recognized as having similar characteristics to that of the footwall alteration system at Hemlo.

In December 2008, Treasury Metals received the first ever NI 43-101 compliant mineral resource estimate on the Thunder Lake Gold Deposit from A.C.A. Howe International Limited. The deposit consists of 130,000 ounces of Indicated gold (820,000 tonnes @ 4.8 g/t Au; Main Zone) and 920,000 ounces of Inferred gold (7,000,000 tonnes @ 4.1 g/t Au; all Zones) using a cut-off grade of 2.0 g/t Au. The average true width of the Main

Zone envelope is 7.6 metres (0.5 g/t Au cut-off) while the higher grade core (3.0 g/t Au cut-off) within the Main Zone averages 1.9 metres true width. Economically significant gold concentrations occur in strongly pyritized and silicified quartz-sericite schist (felsic volcanic) and metasedimentary rocks. Zones of higher gold concentrations take the form of steeply plunging shoots with excellent down-plunge continuity.

The Thunder Lake Gold Deposit has many characteristics that are comparable to other Archean gold deposits in Ontario and has the potential for a major gold discovery at depth (i.e., >800m depth). To date, Treasury Metals has completed only minor drill tests into the deposit to ~750 metres depth and with the deposit being open in all directions, they are confident the current resource can be expanded through step-out, in-fill and deep drilling.

The Kenora District includes the Wabigoon Subprovince which is arguably the second largest assemblage of greenstone belt rocks in the Canadian Shield, yet its gold potential is largely under-explored and certainly under-developed. Today, more than a dozen exploration companies are using modern techniques to re-visit the more than 40 gold occurrences, prospects and deposits in the area, resulting in new discoveries and a better understanding of known gold mineralization.

Anyone involved in exploration knows the old adage “The best place to find a gold mine is within sight of an old mine headframe.” Over the years, prospectors and junior exploration companies have successfully followed this rule, staking near past producing mines and applying new exploration techniques. This has resulted in the identification of new ounces in areas thought to have been mined out. This methodology has resulted in a focus on producing greenstone belts, leaving prospective regions such as the Kenora Gold District largely ignored and underappreciated. Treasury Metals has long recognized the Kenora Gold District as “virgin territory” and has been busy exploring the area which in addition to its prospective geology, is well serviced by existing infrastructure such as highways, rail lines, power and readily available skilled labour.

Treasury Metals Inc. (TSX:TML) believes there is not only an opportunity for discovery of new gold deposits but also justification to consolidate these projects, build sufficient ounces to feed a centralized mill and turn the area into the next Canadian gold mining camp – the Kenora Gold District.

Geology and Mineral Potential of the Lumby Lake Greenstone Belt, Wabigoon Subprovince, NW Ontario

Buse, S. and Lewis, D.

The Lumby Lake greenstone belt is located 40 km northeast of Atikokan and is a Mesoarchean volcano-sedimentary belt within the Marmion Terrane of the Central Wabigoon Subprovince. As part of the Atikokan Mineral Development Initiative, a 1:20,000 scale bedrock mapping project was initiated and supported by a new aeromagnetic survey that was flown in the Finlayson-Lumby Lakes area in 2008. The new mapping has resulted in the delineation of four east-trending depositional

sequences within two tectono-stratigraphic assemblages. The southern tectono-stratigraphic assemblage consists of the Lumby South and Bar Lake depositional sequences whereas the northern assemblage consists of the Lumby North and Pinecone depositional sequences. The southern assemblage is comprised of north-facing depositional sequences dominated by bimodal volcanic rocks with minor metasedimentary rocks that range in age between ca. 3001 and 2998 Ma. The Lumby South depositional sequence unconformably overlies the ca. 3001 Ma Marmion Batholith and is intruded at this contact by numerous gabbroic sills and dikes. In contrast, the northern assemblage consists of bimodal metavolcanic rocks with intercalated clastic and chemical metasedimentary and ultramafic metavolcanics rocks that range in age from ca. 3014 to 2828 Ma. At the top of the Pinecone depositional sequence is the Pinecone sedimentary sequence, which is interpreted to have been deposited in a shallow marine depositional setting. The large scale fault separating the northern and southern tectono-stratigraphic assemblages shows two generations of displacement: early thrust faulting followed by dextral reactivation. This fault is interpreted to represent a major tectonic break in the greenstone belt and implies that two distinct volcano-sedimentary terrains were forming coevally and converged in the late Mesoarchean to early Neoarchean.

The structural geology of the greenstone belt is constrained to three deformational events. The first recognizable regional deformation event (D1) consists of a penetrative east-trending foliation with an associated northeast-trending lineation which are deflected by the intrusion of Neoarchean granitoid rocks. The second deformation event (D2), which overprints the first, consists of sinistral northeast-trending and conjugate east-trending strike-slip faults that occur throughout the Lumby Lake greenstone belt. The largest D2 sinistral fault is the Red Paint fault zone which has offset the Finlayson greenstone belt from the Lumby Lake greenstone belt and has rotated local D1 structures. The third deformation event (D3) is characterized by local north-trending fracture cleavages and gentle folding.

Historically, mineralization has been documented on the western side of the Lumby Lake greenstone belt in the southern tectono-stratigraphic assemblage. Gold mineralization is found predominantly in the vicinity of the Red Paint fault zone and is parallel to northeast-trending structures that host the nearby Hammond Reef gold project of Brett Resources Inc. Felsic metavolcanics rocks at the southern edge of the greenstone belt hosts Cu-Pb-Zn-Ag volcanogenic massive sulphide mineralization. There are also several under-explored ultramafic stocks and sills within the Lumby Lake greenstone belt that contain varying amounts of disseminated magmatic sulphide mineralization which may have potential to host Cu-Ni and platinum group elements.

Atikokan Mineral Development Initiative (AMDI), Steven Siemieniuk

The Atikokan Mineral Development Initiative (AMDI) is a cooperative geoscience project between the Township of Atikokan, Northern Ontario Heritage Fund Corporation, FedNor, Ontario Geological Survey, Lakehead University, and Industry. The Ontario Prospectors Association manages the project.

AMDI is designed to stimulate the exploration for, and eventual development of, mineral deposits within the Atikokan area. To achieve this, AMDI undertook the following: 1) flying airborne geophysical surveys to obtain both new and updated data over current areas of interest; 2) conducting a GIS compilation of publicly available geoscience data; and 3) advocating for, and funding portion of an OGS mapping program in the Lumby Lake greenstone belt.

Two new surveys were flown in 2009 resulting in 568 new conductors and increased magnetic resolution in the Lumby and Finlayson greenstone belts, as well as greatly increasing the magnetic resolution over the western portion of the Marmion Lake batholith. The Lumby-Finlayson Lakes survey was a magnetic and TDEM survey covering 5,294 line-km over two prospective mafic metavolcanic belts. The Marmion Lake survey was an 11,896 line-km magnetic survey covering a portion of the Marmion terrane, a felsic complex host to numerous gold occurrences.

The AMDI GIS compilation project covers a 19,000 square kilometre area roughly centered on the town of Atikokan. A synthesis of over 60 individual publications, it is designed to provide the end-user with a fairly complete library of the geoscientific work that has been completed in the area.

Since inception of the initiative exploration activity has increased steadily. The number of active claim units has risen by over 150 percent, and the number of prospectors and companies exploring up just over 50 percent from 44 in September of 2006 to 89 in November of 2009.

OPA December Symposium
Community Based Geoscience Initiatives - Discover Abitibi Experience

Community based initiatives have been added to the geoscience landscape in Ontario and the Discover Abitibi Initiative (DAI) paved the way. The DAI started as a pilot project and morphed into a longer-term initiative that has provided useful information to the exploration industry in Northeast Ontario and has bridged a gap between industry and local economic development groups. In addition, the initiative has been successful in forming a close collaboration between the Ontario Geological Survey, the Geological Survey of Canada, and the local mining industry.

Abstract – Hammond Reef Gold Deposit, From Resource to Reserve

Hammond Reef Deposit, Atikokan, Ontario
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During the past year Brett has successfully advanced the Hammond Reef Project on a number of fronts.

- In July 2009, the Hammond Reef Resource was increased from 4.8 million ounces inferred to 5.2 million ounces inferred (155 million tonnes grading 1.04 g/t at 0.6 g/t cutoff).
- At a lower cut-off of 0.4 g/t this inferred resource increases to 6.34 million ounces (227 million tonnes at a gold grade of 0.87 g/t) for an additional 1.15 million ounces.
- Metallurgical results indicate that capital and operating cost savings may be achieved by using a mill flow sheet that involves flotation versus whole ore leaching. Gold recoveries from both processes exceed 90 percent, with results from flotation work indicating up to 93% recovery.
- A Memorandum Of Understanding ("MOU") was signed with Brett and all eight First Nation communities that consider Hammond Reef part of their Traditional Land.
- New exploration targets were identified in several areas that remain to be tested.
- A scoping study contract was signed with Scott Wilson Roscoe Postle. The study is due later this year.

Approximately 70,000 meters of drilling is scheduled for completion by the fall of 2010. Information from an infill drill program on the A Zone and the 41 Zone will be used to evaluate the drill spacing necessary to move Brett's current plus 5 million ounce resource from the inferred category to the indicated and measured categories. Drilling in open areas along strike and up and down dip is expected to increase the size of the current resource and has the potential to lower the mine strip ratio. Exploration drilling will target new potential discoveries over the Manley area, the Sande and Stewart and in other new gold zones uncovered by this summer's exploration program.

The Hammond Reef property is located in the Sawbill Bay/Marmion Lake Area of the Thunder Bay Mining Division, approximately 220 km west of Thunder Bay, Ontario. It is underlain by the western portion of the Marmion Lake batholith, situated at the southern margin of the Wabigoon subprovince of the Superior Province. The Marmion Lake batholith is a diverse assemblage of felsic intrusive rocks, varying from granite to tonalite, with local rafts of mafic sheets, gneissic remnants and late stage pegmatite dykes. The gold mineralization at Hammond Reef occurs within a 2.5 km segment of the broader Sawbill Bay Gold District – a continuous anastomosing corridor (1 km to 6 km wide) of sericite alteration and associated gold enrichment, extending from the Steep Rock Group, 15 km to the southwest, to the Lumby Lake assemblage, 30 km to the northeast.

Gold mineralization at Hammond Reef A Zone and 41 Zone is found in all lithological phases of the Marmion batholith. Mineralization is associated with fracture-controlled

quartz vein stockworks and minor pyrite (generally < 1%) in variably altered granitoid rocks and mafic dykes within and adjacent to a foliated schist/fault zone. Gold is hosted within any lithology exhibiting an appropriate concentration of brittle, micro- to macro-fractures. A petrographic study by Lakefield Research indicates gold grains tend to be preferentially sited on pyrite aggregate grain boundaries. Minor visible gold also occurs as free grains on sericitic foliation planes within the highly altered granitoids.

Southern Ontario 2009 - The Year in Review

2009 was a year of change and challenge for Southern Ontario. Mineral production was influenced by sharp declines in demand related to declines in construction, auto, paper and related industries.

Mining Act Modernization saw the withdrawal of all open crown mineral rights in Southern Ontario where surface rights were privately held and the promise of map staking for remaining crown mineral rights south of the French River.

Despite the challenges, there were a number of positive events that give cause for optimism. Canadian Wollastonite resolved issues with municipal planning and permitting on the company's St. Lawrence deposit north of Kingston. First Nickel Inc. and joint venture partner, Pacific Northwest Capital Corporation reported positive results from the Raglan Hills prospect and incidentally proved that modern airborne geophysical survey techniques are successful in understanding the Grenville Province.

Recommendations for exploration in southern Ontario provide new approaches to gold, base metal and industrial mineral prospects. Rare earth elements and a variety of commodities related to green energy are highlighted.

Pamela J. Sangster, Regional Resident Geologist, Southern Ontario

APPLICATION OF 3D SPECTRAL BOREHOLE IP TO GUIDE DRILLING ON THE BIG DOME PROJECT, TYRRELL TOWNSHIP, ONTARIO. (Goldeye Explorations Ltd. and JVX Ltd.)

Goldeye Explorations Ltd. acquired the Tyrrell property by staking in 1990 and added to the property in 1998. The Big Dome High Grade Zone was discovered in October 1998 when hole G98-9 intersected 149g/t Au over 1.4 m (from 271.2 m to 272.6 m). In 2005 three additional holes were drilled intersecting High Grade Gold. Hole G-05-22 intersected 217g/t Au over 2.05 m (from 199.5 m to 201.55 m). Hole G-05-23 intersected 80.7 g/t Au over 2.09m (from 377.16 m to 379.25m). G-05-26 intersected 31g/t Au over1 m (from 510 m to 511m). In 2008 Hole G-08-32 intersected 44 g/t Au over 1.5m (from 427.5 to 429m). Spectral Borehole IP survey was carried out to trace out the high grade zone to depth and to locate other sulphide zones in the Big Dome area for further drilling.

3D Conductivity and Chargeability Inversion Models were computed using Spectral Borehole IP Data. Drillholes were spotted using these models on two chargeable bodies, one 400m west and the other 75m east of the high grade mineralization zone at a vertical depth of 250m. Both holes have intersected thick sections of sulphides with silicification, assays have not been completed.

Soil Gas Hydrocarbon Geochemical Pathfinder Classes Reduce Exploration Risk

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ABSTRACT: Surficial soil surveys use pathfinder elements that have been shown to be useful as a predictive geochemistry in determining the location of exploration targets. The Soil Gas Hydrocarbon (SGH) geochemistry has the ability to uses a wide variety of sample types including soil, lake-bottom sediment, humus, peat, and even snow. This flexibility is critical in Ontario's difficult field conditions and that of Canada's north. SGH is based on a weak leach extraction of near surface samples followed by an analysis having the sensitivity to detect the minute but unique organic hydrocarbons that bacteria have leached and metabolized from interaction with mineral deposits at depth. These compounds are not gaseous but migrate from depth with the electrochemically induced mass flow from the oxidation and reduction reactions in REDOX cells developed over buried targets. Surficial samples act as collectors of the over 160 specific heavier hydrocarbons that are grouped into chemically related "pathfinder" classes that have dispersed to the surface. The expected order of dispersion or geochromatography of these classes is able to vector to the location of buried exploration targets. Specific combinations of the classes identify the target type even at over 500 metres in depth. SGH is a dual purpose deep penetrating predictive geochemistry that can both locate and identify blind Uranium, Gold, SEDEX, VMS, Nickel, Copper and rare earth pegmatite type mineral targets, as well as for Kimberlite pipes and Petroleum plays.

Presentation Title: **"Northern Superior Resources……making it happen on the Canadian Shield"**

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Presenter's Full Name – Dr. Thomas F. Morris

Brief Presentation Summary

Northern Superior Resources Inc. is a junior exploration company focused on gold exploration on the Canadian Shield in Ontario and Quebec. The Company has three marquee projects: Ti-pa-haa-kaa-ning (TPK), Wachigabau, and Thorne Lake.

Mining and Exploration Overview of Northeastern Ontario

Brian Atkinson[1], Mike Cosec[2], Dave Guindon[3] and Anthony Pace[4]

[1] Regional Resident Geologist, Timmins Region
[2] District Geologist, Sudbury District
[3] Regional Resident, Geologist Kirkland Lake Region
[4] District Geologist, Sault Ste. Marie

This talk will feature highlights of mining and exploration activities for each Resident Geologist district covering northeastern Ontario. In keeping with the theme of 'A Decade of Risk and Rewards', the presentation will highlight exploration trends and mineral production over the last ten years and use current projects as the basis for commenting on the next ten years of exploration and discovery.

With over 500 exploration projects currently underway and 20 operating gold, base metal and industrial mineral mines, Northeastern Ontario remains a critical and strategic component of the Ontario and Canadian mining industry.

The number of claims staked over the last decade, in concert with exploration dollars spent has ensured northeastern Ontario's prominence in the global mining industry. Grade and tonnage considerations aside, northeastern Ontario remains the dominant area to explore, develop and mine the rich and varied mineral resources of the province.

Buoyed by the soaring price of gold and robust commoditiy prices, exploration has regained momentum after the pause for last October's recession. Companies are again attracting exploration risk capital and financing new projects and major developments.

With the greening of public interest and environmental issues, a rekindled focus for rare earth elements has re-invigorated the search for those commodities.

The Kidd-Munro assemblage, Ontario: An update on the TGI project

Ben R. Berger[1], Michel. G. Houlé[1], Étienne Dinel[2], John A. Ayer[1]
1. Ontario Geological Survey
2. Geological Survey of Canada

1.1 INTRODUCTION

The Kidd–Munro assemblage is well recognized for its mineral endowment, with several Zn-Cu VMS deposits such as the giant Kidd Creek mine and the Potter mine deposits, and several komatiite-associated Ni-Cu-(PGE) deposits such as the Alexo mine, the Dundeal and the Dundonald South deposits. The Kidd-Munro project is a multi-

disciplinary effort between the Ontario Geological Survey, Géologie-Québec, and the Geological Survey of Canada under the Targeted Geosciences Initiative Phase 3 (TGI-3) to examine the geochronology, stratigraphy, geochemistry and structure in relationship to base metal mineralization in the Kidd-Munro assemblage. Preliminary results of the Kidd-Munro project are summarized in this contribution.

The Kidd-Munro assemblage is part of a volcanic episode that spans from 2719 to 2711 Ma and extends from west of the Kidd creek mine to the Québec border. New U-Pb age dates funded under the TGI-3 initiative have permitted refinement of the boundaries of the assemblage. Geochronological results from intermediate metavolcanic rocks in Coulson and Dundonald townships returned U-Pb zircon ages of 2715 and 2714 Ma, respectively, and extends the assemblage north and west of its previous limits. A new age of 2717 Ma confirms that a cluster of older metavolcanic ages occurs in central Dundonald Township and this will help constrain stratigraphic and structural interpretations in this area. Younger metasedimentary and metavolcanic rocks with ages from 2702 Ma to < 2692 Ma locally occur as infolded wedges or fault slices within the assemblage indicative of a complex structural history.

1.2 GEOLOGICAL SETTING

The Kidd-Munro contains diverse rock types including ultramafic, mafic, intermediate and felsic metavolcanic rocks, and clastic and chemical metasedimentary rocks which have been subdivided into predominantly calc-alkalic, transitional, tholeiitic and komatiitic suites within the assemblage.

The calc-alkalic suite is characterized by $Zr/Y \geq 7$, steep negatively sloped chondrite normalized REE patterns and pronounced primitive mantle depletions in Nb, Ta and Ti with elevated Th. This suite is composed dominantly of plagioclase porphyritic andesite and dacite fragmental rocks with subordinate basalt and rhyolite. The calc-alkalic rocks occur mainly in the north and east part of the assemblage.

The tholeiitic suite is characterized by $Zr/Y \leq 4$, flat chondrite normalized REE patterns and depleted primitive mantle Th. This suite is composed of bimodal basalt and rhyolite flows with subordinate fragmental units and numerous subvolcanic (gabbroic) units. The felsic volcanic rocks are high silica, tholeiitic rhyolites similar to those that host the Kidd Creek VMS deposit occur in several locations but are more common at or near the southern boundary of the Kidd-Munro assemblage.

A transitional suite is characterized by Zr/Y between 3 and 7, negatively sloped LREE and flat HREE chondrite normalized patterns, and weakly depleted Nb, Ta and elevated Th compare to primitive mantle. This suite is composed of mafic, intermediate and felsic metavolcanic rocks that are typically fragmental, locally very amygdaloidal, and may contain anhedral to euhedral plagioclase phenocrysts from 1 mm to 1 cm in size. These rocks are closely associated with the tholeiitic suite but their distribution is poorly constrained. Recent mapping indicates that the transitional suite underlies the tholeiitic suite and stratigraphic subdivision into formations may be possible throughout the assemblage.

The komatiitic suite is characterized by flat REE to slightly depleted LREE chondrite normalized patterns and local LREE-enriched and Nb depletion on primitive mantle normalized patterns suggesting local contamination. This suite represents up to ~11% of the Kidd-Munro assemblage and is variably composed of thick olivine cumulate flows and sills to thin spinifex-textured komatiite and komatiitic basalt flows. Thick successions of komatiites are localized at Kidd Creek, in Tully Township, in Dundonald Township and in Munro Township with flows/sills either absent or present only as thin units in the intervening areas. Komatiites occur in at least three different stratigraphic levels in the Kidd-Munro assemblage and future work is designed to confirm stratigraphic correlation and to determine if additional komatiite horizons are present.

1.3 STRUCTURAL SETTING

The Kidd-Munro assemblage defines a regional scale synform with respect to adjacent assemblages. The Pipestone fault which is an early south-verging thrust demarking the contact between the Kidd-Munro assemblage and the younger Porcupine assemblage composed of clastic metasedimentary along much of the southern contact. In the east, the Pipestone fault merges with the Porcupine – Destor fault zone and the latter structure separates the Kidd-Munro assemblage from the Tisdale, Blake River and Timiskaming assemblages near the Quebec border. In the east, the north branch of the Porcupine-Destor fault zone separates the calc-alkalic suite of the Kidd-Munro assemblage from the older Stoughton –Roquemaure assemblage (2723-2720 Ma) but further to the west, the north contact is poorly constrained and is inferred from widely distributed geochronology samples especially northeast of the Kidd Creek mine. Regional folding events created doubly plunging, curvilinear fold axes that affected all assemblages in this part of the Abitibi greenstone belt. Modelling regional gravity and to a lesser extent seismic data supports the concept that the Kidd-Munro assemblage is best explained as part of an autochthonous Abitibi stratigraphic sequence which has been subsequently deformed into imbricate thrust and fold panels

1.4 ECONOMIC GEOLOGY

The giant world class Kidd Creek mine and the Potter mine are the two best known VMS deposits; however, several other VMS style occurrences are hosted by the Kidd-Munro assemblage. VMS mineralization is typically associated with rhyolite but the Potter mine mineralization is hosted in tholeiitic mafic fragmental rocks and komatiites associated with numerous basaltic and komatiitic sills and peperite breccia. The “Terminus zone” in Dundonald Township has many similarities to the Potter mine which suggests that there is untested potential for mafic-hosted VMS mineralization in the Kidd-Munro assemblage as well as more traditional rhyolite-hosted deposits.

Komatiite hosted magmatic nickel-copper mineralization occurs at several locations in Dundonald Township such as the Alexo, the Kelex, the Dundeal and the Dondonald South deposits and was mined from the Alexo and Kelex deposits. One other showing of this mineralization type is reported from Munro Township but there is good potential for additional deposits in these rock units along the Kidd-Munro assemblage as exploration for this type of mineralization has been limited.

Several gold deposits and occurrences are hosted in the Kidd-Munro assemblage. The most important mineralization is the Lightning zone at the Holloway mine which is

hosted in Kidd-Munro assemblage metavolcanic rocks within the Destor-Porcupine fault zone. Gold mineralization is also reported in several locations along the Pipestone fault in Kidd-Munro assemblage rocks. Tholeiitic rhyolite either along the Pipestone fault or in splay faults are the preferred host for gold mineralization because they have high Fe/Mg and are more brittle than the surrounding mafic and komatiitic volcanic rocks.

Geological Environments for Komatiite-Associated Ni-Cu-(PGE) Deposits in the Abitibi Greenstone Belt: An Ontario Perspective

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Magmatic Ni-Cu-(PGE) sulfide deposits are associated with a wide range of mafic-ultramafic magma types (e.g., Al-depleted and Al-undepleted komatiite, komatiitic basalt and Fe-rich komatiitic basalt, high-Mg and tholeiitic basalt) within a broad range of age from Mesoarchean to Phanerozoic. Magmatic Ni-Cu-(PGE) deposits occur primarily in rifted continental settings (continental rifts, rifted continental margins, rifted arcs), in both volcanic and subvolcanic settings, and are associated with a wide range of S-rich country rocks. However, several factors are considered critical to the genesis of economically significant magmatic sulfide deposits: 1) magmas that are undersaturated in sulfide will contain greater concentrations of Ni, Cu, and PGE; 2) magmas that have access to an external S source will achieve sulfide saturation prior to significant fractionation; 3) sulfides that form in a dynamic system and interact with greater abundances of magma (i.e., high R factors) will have higher metal tenors; and 4) massive or semi-massive sulfides will normally be concentrated in a physical trap (embayment, inflection).

Komatiitic rocks within the ~2.7 Ga Abitibi greenstone belt occur mainly within the 2750-2735 Ma Pacaud assemblage, the 2723-2720 Ma Stoughton-Roquemaure assemblage, the 2719-2711 Ma Kidd-Munro assemblage, and 2710-2704 Ma Tisdale assemblage, but rarely within the 2730-2720 Ma Deloro assemblage. Of the 8 komatiite-associated Ni-Cu-(PGE) **mines**, 7 *deposits***,** and several occurrences in the Abitibi greenstone belt, 6 occur within the Kidd-Munro assemblage of Ontario (**Alexo-Kelex**, *Dundeal*, *Dundonald South*) or the time-equivalent Malartic Group in Québec (**Marbridge #1-3-4 and #2**, *Bilson*, *Dumont*), and 9 occur within the Tisdale assemblage (**Redstone**, **Langmuir #1**, **Langmuir #2**, **Texmont**, **McWatters**, *Hart*, *Sothman*, *C Zone/Bannockburn, W4/Shaw Dome*), and only one occurrence occurs thus far within the Deloro assemblage (Bruce Lake occurrence). Mineralization appears to be clustered on the regional scale, occurring wherever favourable host rocks are exposed.

Although most of the komatiites in the AGB have been previously considered to be extrusive, an increasing number of units have been shown to be intrusive and it now appears that komatiite-associated Ni-Cu-(PGE) mineralization in the AGB occurs within a spectrum of environments ranging from intrusive (*Dumont*, *Sothman*) through subvolcanic (**Kelex-***Dundeal-Dundonald South*, **McWatters**-Galata) to extrusive (**Alexo**,

Hart-**Langmuir #1 and 2**-**Redstone**, **Marbridge**, **Texmont**, *Hart*, *W4/Shaw Dome*, *C Zone*-Thalweg Mickel/Munro, W2/Shaw Dome). Thus, komatiite-associated Ni-Cu-(PGE) mineralization in the AGB is not restricted to specific stratigraphic contacts as previously believed, but may occur in any environment (intrusive, subvolcanic, or volcanic) throughout the stratigraphy where lava pathways have had access to external S. The ore environments within those assemblages are characterized by four different types of volcanic successions: 1) quasi-uninterrupted thick packages of komatiites and komatiitic basalts (e.g., Munro, Bartlett Dome), 2) interlayered komatiites and intermediate to felsic calc-alkaline/transitional volcanic rocks (e.g., lower part of Shaw Dome), 3) interlayered komatiites and mafic to intermediate tholeiitic volcanic rocks (e.g., upper part of Shaw Dome), or 4) a combination of 2 and 3 (e.g., Dundonald Township).

Our recently increased understanding of the volcanology and stratigraphy of komatiites in the AGB indicates that with increased exploration there is potential for the discovery of new Ni-Cu-(PGE) deposits associated with komatiites in both less explored (e.g., Bartlett Dome) and also more explored (e.g., Shaw Dome) camps. Targeting komatiite-associated Ni-Cu-(PGE) deposits relies on identifying areas of high magmatic flux within deformed and metamorphosed greenstone belts requiring an understanding of the physical volcanology of magma/lava pathways and their geophysical-geochemical signatures. However, the smaller, less dynamic and less extensive systems in the AGB make it more difficult to predict the location of mineralized lava channels or channelized sheet flows/sills within different komatiitic successions.

Thus far, based on chalcophile element data, physical volcanology, and stratigraphic framework in the AGB, almost all komatiitic successions are prospective for komatiite-associated Ni-Cu-(PGE) deposits, but the Kidd-Munro- and the Tisdale-aged komatiitic rocks remain most prospective, which are also the only assemblages that contain both abundant magma/lava pathways (magma conduits, feeder sills, lava channels, and channelized sheet flows) and external sources of S. A multidisciplinary approach including geological mapping, volcanic facies mapping, geophysical surveys, and geochemical studies is required to aid in the exploration for these new deposits and to facilitate the recognition of favourable volcanic sequences that may host magmatic Ni-Cu-PGE mineralization.

Another Busy Year for Exploration in Kirkland Lake

Charles Page, Queenston Mining Inc.

The 2009 calendar year has been one of the busiest in the history of the Company. Total exploration expenditures for the year are estimated at $10 million representing 80,000 m of drilling. The work included, 1. Deep drilling on the Upper Beaver project; 2. Resource definition and exploration drilling at McBean and Anoki; 3. Shallow exploration drilling at Upper Canada; 4. Underground resource definition drilling in joint venture with Kirkland Lake Gold Inc. on the South Claims property; 5. Deep surface drilling on the AK and HM property; 6. Surface exploration drilling with Newstrike Resources on the Commodore property; and 7. Exploration drilling on the Lac-McVittie property. This program led to the discovery of a deep Au-Cu system at Upper Beaver, the development of a NI 43-101 mineral resource at McBean that included the discovery of the C-19 Zone, the potential for a low-grade bulk mining target at Upper Canada, expansion of the high-grade resource on the South Claims JV property, the discovery of the South Mine Complex further east and south on the AK and HM properties, the discovery of a new gold system at the Commodore JV. Queenston's preliminary exploration budget for Kirkland Lake in 2009 is estimated at $15 million.

ClearView Geophysics Inc.
Joe Mihelcic

Title: **The Ghosts of Geophysics Past, Present and Future**

Geophysical methods and surveys are primarily selected to prioritize, focus and avoid more costly and risky intrusive ground investigations. Use properly, this holds true. A few examples are presented where certain geophysical methods and surveys are under- or over-applied from the viewpoint of a geophysical service provider. A number of reasons for this are presented, based on past experiences, presently available technologies and future trends.

Enhance Your Gold Exploration with the latest GDD 3D IP Receiver and the new GDD Portable Sample Core IP Tester

Pierre Gaucher, President, Instrumentation GDD Inc.
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A quick overview of some of the features of the latest GDD 3D 32 channels IP Receiver and how it can help customers to define 3D Gold mineralization. In the second part of the presentation, find out how one can relate within minutes disseminated sulphides found in Diamond Drill Core to past or future IP surveys using the new GDD handheld Sample Core IP Tester (SCIP Tester).

The Ring of Fire: An Overview of the Geology, Mineral Deposits and Exploration History of the McFaulds Lake Area

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The McFaulds Lake area of northern Ontario has been the focus of intense exploration activity since 2002, already resulting in the discovery of a remarkable number of varied metallic mineral deposits, including:

- Volcanogenic massive sulphide copper-zinc-silver;
  - e.g. McFaulds #3 deposit (Indicated: 802 000 t @ 3.75% Cu, 1.1% Zn)
  - e.g. McFaulds #1 deposit (Inferred: 839 700 t @ 1.03% Cu, 2.38% Zn)

- Orthomagmatic copper-nickel-PGE;
  - e.g. Eagle One (Eagle 1A) (Indicated and Inferred: 2.9 Mt @ 2.1% Ni, 1.2% Cu, 1.2 g/t Pt, 4.1 g/t Pd and 4.0 g/t Ag);

- Orthomagmatic chromium $\pm$ iron $\pm$ vanadium $\pm$ titanium $\pm$ PGE; and
  - e.g. Black Thor (potential ranging from 50 Mt to 60 Mt @ 31% to 38% Cr_2O_3)

- Lode gold
  - e.g. Triple J: (drill-traced over 1.0 km strike length, depth >300 m.; ranging from 0.3 to 30.0 g/t Au)

The arcuate area termed the “Ring of Fire” is underlain by the folded Neoarchean McFaulds Lake greenstone belt and subvertically dipping mafic to ultramafic intrusions, at least some of which are layered and crosscut the western portion of the belt. An altered, feldspar-phyric dacite associated with the VMS mineralization returned an age of 2737 $\pm$ 7 Ma.

Despite limited radiometric dating, field constraints indicate that there might be at least two main ages of layered intrusions preserved in this region: an older, Mesoarchean suite, *ca*. 2808 Ma (e.g. Highbank Lake intrusion), close to the southwestern boundary of the Oxford-Stull domain, and a younger, Neoarchean suite of intrusions hosting the copper-nickel-PGE and chromite discoveries.

Over 40 companies have been involved in exploration in the Ring of Fire, spending approximately $60 million since 2002. Approximately 32 000 claim units, totaling over 5000 km^2, have been staked. The scarcity of outcrop and Paleozoic cover in the eastern portion of the area have created a reliance on detailed geophysical surveys and diamond drilling to identify exploration targets, delineate deposits and elucidate Archean basement geology.

Highlights from the Ring of Fire
Jim Atkinson, Director of Exploration, Noront Resources

The presentation will highlight Noront's work in the Ring of Fire touching on the general and local geological settings and describing recent discoveries.

Northwestern Ontario's Ring of Fire area (ROF) has received an unprecedented amount of attention since the fall 2007 discovery of the "Eagle One" Magmatic Massive Sulphide (MMS) deposit by Noront Resources. The area continues to dominate the Canadian exploration industry with Noront expanding the nickel resource at Eagle One and the recent chromite discoveries by Noront, Freewest, Spider/KWG and Probe. All of these high-grade discoveries occur over a 14km+ trend.

Noront continues to aggressively explore in the ROF. With over 110,000 hectares of property and active JV's with two other companies Noront is fully committed to the ROF. The ROF continues to demonstrate that it is a prospective area to explore with deposits of Ni/Cu/ PGM, Chromite, Gold, Vanadium, Cu/Zn and VMS identified to date by Noront and others.

Noront's success has resulted in it being able to previously complete a 43-101 compliant resource estimate for the Eagle One Magmatic Massive Sulphide (MMS) Ni/Cu/PGM deposit while recently they completed Canada's first 43-101 chromite resource estimate on the Black Bird Chromite deposit.

On going exploration beneath the Eagle One deposit has identified that the mineralization continues to at least 1000 meters below surface with no signs of stopping so Noront will be updating the 43-101 resource estimate on what is now called the Eagle's Nest Deposit by early 2010. The mineralization identified to date comprises massive, sulphide, net-textured sulphide and disseminated sulphide and shows intersections over 150 m in length. Grades are very consistent with those identified in the Eagle One Resources Estimate.

Noront has prepared a 43-101 compliant resource estimate for the Blackbird deposits which will be released in early 2010 and along with preliminary metallurgical investigations shows this to be a highly desirable deposit. The remaining parts of the belt have also yielded deposits of chromite of significant thickness and grade.

The recently announced Triple J gold zone to the southwest of the Eagle's Nest adds a new dimension to the ROF. The mineralized shear zone has been traced by over 40 holes for a distance of 1.5 km and remains open along strike and to depth.

Finally Noront's Thunderbird vanadium although not fully explored appears to contain a large deposit of this strategic metal.

Exploration and Development of a World Class Chromite Deposit McFaulds Lake Area, Northern Ontario

In 2006, a single seven metre drill core intercept of chromite, located 12km west of McFaulds Lake, was discovered by the Spider Resources Inc. – KWG Resources Inc. joint venture on claims optioned from Freewest Resources Canada Inc. This intercept has now been traced by a 2008 and 2009 drill program for 1100m with widths of 100m consisting of multiple layers of disseminated and massive chromite, often with a central 40m band of massive chromite and is called the Big Daddy Zone.

To the north, drilling by Freewest on their 100% owned claim, was started in September 2008 and all of 2009, has traced with gravity and drilling two horizons for 3800m and 2500m, called Black Thor and Black Label, respectively. Again multiple layers of massive, semi-massive and disseminated chromite were traced along the Black Thor and Black Lable horizon. A textural difference between the Black Label and Black Thor has been noted which is the presence of fragments in Black Label and talc altered oikocrysts (large pyroxene crystals), leaving a fragmental appearance. This texture also occurs in the Big Daddy zone.

The Cr:Fe ratio of samples studied so far suggests a high quality chromite is present in both the Big Daddy and Black Thor areas, exceeding 2:1 for the most part. Black Label samples are also excellent in the 1.6:1 to 1.8:1 range. Other deposits in Finland and South Africa are in the 1.3:1 range.

The McFaulds chromite zones resemble the Kemi chromite mine in Finland where a 40m thick massive chromite open pit mine occurs. Both Kemi and McFaulds are Archean in age.

Chromite has not been produced commercially in North America and all chromite for the stainless steel industry is imported from South Africa and Zimbabwe. 90% of the world production goes to stainless steel production. China consumes 50% of the world chromite production, and North America consumes around 15-20% which amounts to 2 million-4 million tonnes of Cr_2O_3 per year.

Electric furnaces are used to produce ferrochrome from chromite with a reductant such a coke added. To deliver this sort of annual tonnage from an open pit operation at McFaulds, a rail transportation network is the only sensible approach. This will involve constructing a 350km rail link from Nakina to McFaulds Lake Area. Engineering studies are to commence this winter.

The McFaulds chromite discovery is historical since it is a first for North America and equivalent in importance to the discovery of diamonds in Canada since that was a first, and may be equal in value as all of Hemlo, the main part of the Porcupine Camp or the Kidd Creek mine.

Liberty Mines: An Update on Current Ni Resources and Future Potential

by Ulrich Kretschmar, VP Exploration

Liberty Mines Inc. has three projects with 100 % ownership in the Timmins area. Within the area of the **Shaw Dome project,** there are three mines about 25 km south of Timmins. The Redstone mine is in commercial production, McWatters is expected to come on stream in January 2010 and the Hart mine is in the advanced permitting stage. The 2,000 tonne/day Redstone nickel concentrator, designed to process altered komatiite ores is located at the Redstone Mine site.

For the mines, NI43-101 compliant published reserves in all categories are:

1) **Redstone Mine Resources** (SRK July 2007, using 0.7% cutoff)

	Tonnes	**% Ni**	**% Cu**	**Contained Ni Tonnes**
Measured & Indicated	419,000	2.31	0.01	9,698
Inferred	148,000	3.44	0.00	5,099

A revised estimate which will include resources below the 1600 ft level is expected shortly.

2) **McWatters Mine Resources** (SRK, Dec 2008, using 0.4% Ni cutoff)

Resource Classification	**Ore Type**	**Tonnes**	**% Ni**	**Contained Ni (Tonnes)**
Indicated	Massive	49,597	3.93	1,949
	Disseminated	941,200	0.64	6,024
Measured & Indicated	TOTAL	**990,797**	**0.80**	**7,673**
Inferred	massive	13,829	3.39	469

In August 2009 development of the McWatters mine recommenced with current advances on the 85 and 155 m levels. Overburden stripping for open pit development is to commence early in 2010.

3) **Hart Mine Resources (**SRK 9 October 2008, using 0.6% cutoff**)**

Resource Classification	Ore Type	Tonnes	% Ni	% Cu	Contained Ni (Tonnes)
Indicated	Massive	1,378, 287	1.49	0.10	20,526
	Disseminated	178,399	0.50	0.03	892
	Iron Formation	131,852	0.68	0.06	897
Indicated	**TOTAL**	**1,688,538**	**1.32**	**0.11**	**22,325**
Inferred	massive	288,433	1.34	0.09	3,865
	Disseminated	75,269	0.46	0.03	346
	Iron Formation	13,692	0.84	0.07	115
	TOTAL	**377,394**	**1.15**	**0.08**	**4,326**

Liberty has a 100% interest in 6,400 ha in the **Groves Ni-Cu-PGM project** 20 km southeast of Gogama. The Groves project contains an historically reported resource of 500,000 tons (Canadian Mines Handbook, 1957) of 1.5% combined Cu+Ni to 45.7 m depth in two separate zones within the 12 km long Groves intrusive. Within the gabbroic/dioritic core, the southern zone is continuous over 69 m with an average historical grade of 0.975% Ni and 1.18% Cu to a depth of 5.85 m. The northern zone can be traced eastward for 123 m at an average grade of 1.56% Ni and 1.46% Cu to 3 m depth. Both zones are open at depth. Values of 3.41 g/t Pt and 4.96 g/t Ir have been historically reported over 2.68m. 4.6 oz Au per ton has been reported from grab samples. There has been limited historical work on the newly acquired properties.

Liberty also has a 100% interest 6,300 ha in the **McAra Lake-Ray Co-Ni-Cu project** about 120 km south east of Timmins. Initial drilling shows near vertical veins of Co-Ag-Cu grading up to 11 % Co as well as Ni-Co veins.

In summary, within the Shaw Dome project, currently outlined 43-101 compliant resources are sufficient to operate the Redstone nickel concentrator several years at about 1,800 T/day. Our Galata prospect (with surface grabs of 5%) has potential to lead to further resource increases. As well there are numerous insufficiently explored Ni showings in the Shaw Dome. The McAra-Ray project has the potential to add 500,000+ T of historical resources to our inventory, giving Liberty the potential to be a primary producer of cobalt as well as nickel.

Exploration techniques to aid in evaluating the large Liberty property holdings include substantial improvements in understanding of komatiite-associated nickel deposit genesis as well as advances in geophysical, geochemical, lithofacies and stratigraphic techniques to find them. The primary targets are small, high-grade komatiite-associated Ni deposits of the Kambalda type or larger, lower grade deposits similar to Mt. Keith.

Advances in understanding of regional geology in the Shaw Dome, led by precise age dating and structural and lithofacies mapping permit a better delineation of favourable stratigraphy.