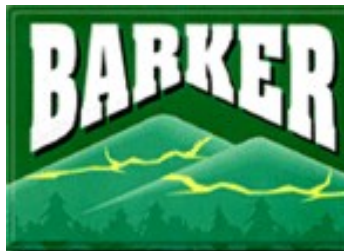


**Technical Report on the
KANGAROO Property**

Cariboo Lake Area

Cariboo Mining Division, British Columbia

for
Barker Minerals Ltd.
8384 Toombs Drive
Prince George, B.C.
V2K 5A3



Prepared by
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May 8, 2009

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3.0 SUMMARY

The Kangaroo Property is located approximately 8 km northwest of the town of Likely and 90 km northeast of the City of Williams Lake. The Property is owned 100% by Barker Minerals Ltd. of Prince George, B.C. The size of the Kangaroo Property is 2,821 ha (144 cells or units) and occurs within an 80 km x 30 km contiguous block of claims owned by Barker Minerals, informally named the 'Peripheral' claims, approximately 115,000 ha in size.

The mineral prospects on the Kangaroo Property are for Au skarn, intrusion-related Au pyrrhotite veins, and porphyry Cu±Mo±Au. Cross Lake Minerals Ltd.' QR gold mine, considered an Au skarn deposit, located 8.0 km WSW of the Barker Minerals' Kangaroo Property, is considered the possible model for mineralization explored for on the Kangaroo Property.

The geology of the Kangaroo Property consists of sedimentary and volcanic rocks of the Upper Triassic to Lower Jurassic Nicola Group and associated intrusions, similar to lithologies at the QR mine. The intrusive stock at Kangaroo as mapped is at least approximately 1 km x 1.8 km on the ground surface, similar in size to the QR stock. More detailed mapping may revise the Kangaroo stock's area upward.

Regional reconnaissance geochemical sampling was done in the area by various explorers in the 1970's and 80's. The area of the QR mine has been under exploration since the mid 1970's; the mine was started by Kinross Gold Corp. in 1994 and operated to 1998; mining was restarted by Cross Lake Minerals Ltd. in 2007. From 2003-2005 Barker Minerals prospected and did limited reconnaissance soil sampling and geophysical surveys over the area of the Kangaroo Property to determine whether geochemical and geophysical trends on Cross Lake Minerals' adjacent Cariboo property continued onto Barker Minerals' ground. A gold soil anomaly on the Cariboo property was associated with core from their drill hole C-89-6 assaying 5.26 g/t Au over 8.5 m in a wide zone of silica alteration.

In 2007 Barker Minerals drilled 9 holes (2,008 m) on geophysical and geochemical anomalies from the 2003 and 2005 reconnaissance surveys. Barker also cut approximately 40 km of survey lines, over which 605 soil samples were collected and an IP geophysical survey was done.

In the 2007 drilling program, spotty high gold values (up to 15,700 ppb Au over 1.51 m in hole K07-1) occurred in several holes. At the time of the drilling, the zone on the north side of the Kangaroo stock was not recognized as the most altered and prospective; this zone is considered to be as yet untested by drilling.

A 1 km x 2 km area of anomalous Au in soils remains open to the east and south. The Au anomaly occurs together with Cu, As, Mo and other pathfinder elements over the stock and the intruded sedimentary and volcanic rocks.

The IP survey determined a low resistivity anomaly extends approximately 1,000 m from the north side of the stock. Zones of relatively high chargeability are associated with the intrusive. Zones of high chargeability and low resistivity occur on the south side of the intrusive but generally are not as intense or extensive as on the north side.

The extensive alteration zone, characterized by soils anomalous in Au and pathfinder elements and zones of chargeability and low resistivity, over and adjacent to the intrusive stock should be defined and comprehensively tested. The soil and geophysical surveys should be extended. Trenching, drilling and additional mapping should be done.

4.0 INTRODUCTION

This report was prepared at the request of Mr. Louis E. Doyle, President of Barker Minerals Ltd. The purpose of this report is to summarize the geology, mineralization and work done to date on the Kangaroo Property and recommend further work to enhance the economic potential of Barker Minerals' mineral properties in the Cariboo Lake area. A schedule of work is proposed for the Kangaroo Property.

The sources of information for this report include historical assessment reports, government publications, reports filed with the System for Electronic Document Analysis and Retrieval (SEDAR) for Barker Minerals Ltd. and the personal experiences of this author during his work on Barker Minerals' properties from 2006-2008. This author has worked for Barker Minerals as an independent consultant in 2006, as Vice President of Exploration since April, 2007 and has supervised work done on the Property.

A listing of information sources is provided in Section 23.0 References. Appendix D contains a Glossary of Technical Terms and Abbreviations.

5.0 RELIANCE on OTHER EXPERTS

Sections 7.0 and 9.0 of this report have adopted excerpts from Perry, B.J. (2002) and Payne and Perry (2001). Mr. Perry was a Qualified Person under NI-43-101 at the time of his writing these reports.

The geological descriptions in Section 9.0 and 10.0 derive mainly from British Columbia Geological Survey (BCGS) publications by Struik (1988) and Panteleyev et al. (1996).

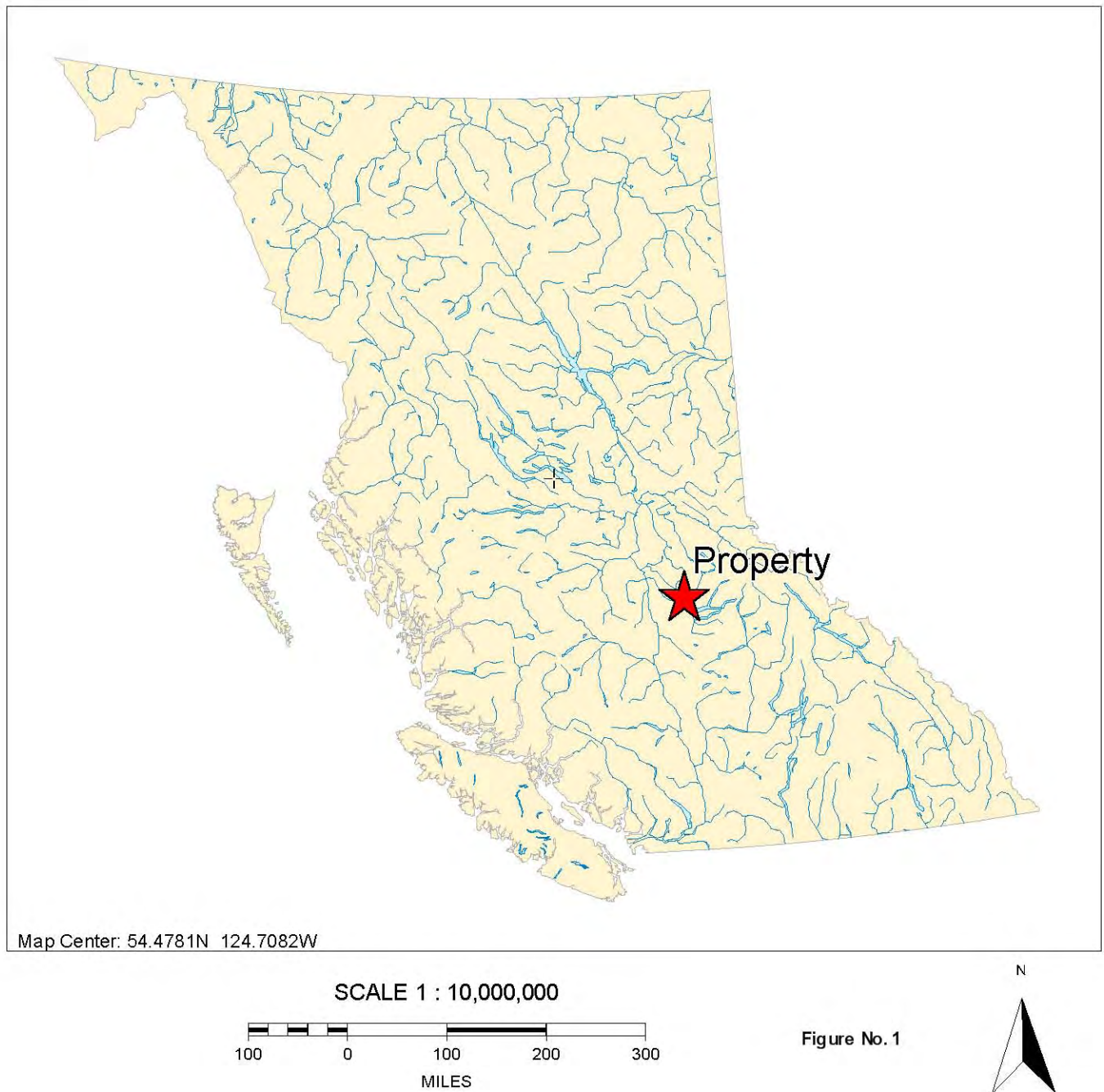
The extensive knowledge of L.E. Doyle, gained from his own prospecting activities, research and management of exploration projects in the Cariboo region have been instrumental in determining the exploration methods and strategy in Barker Minerals' projects since 1993. Under supervision of qualified professionals he has overseen all aspects of Barker Minerals' exploration and has been the driving force in designing projects and interpreting exploration results.

6.0 PROPERTY DESCRIPTION and LOCATION

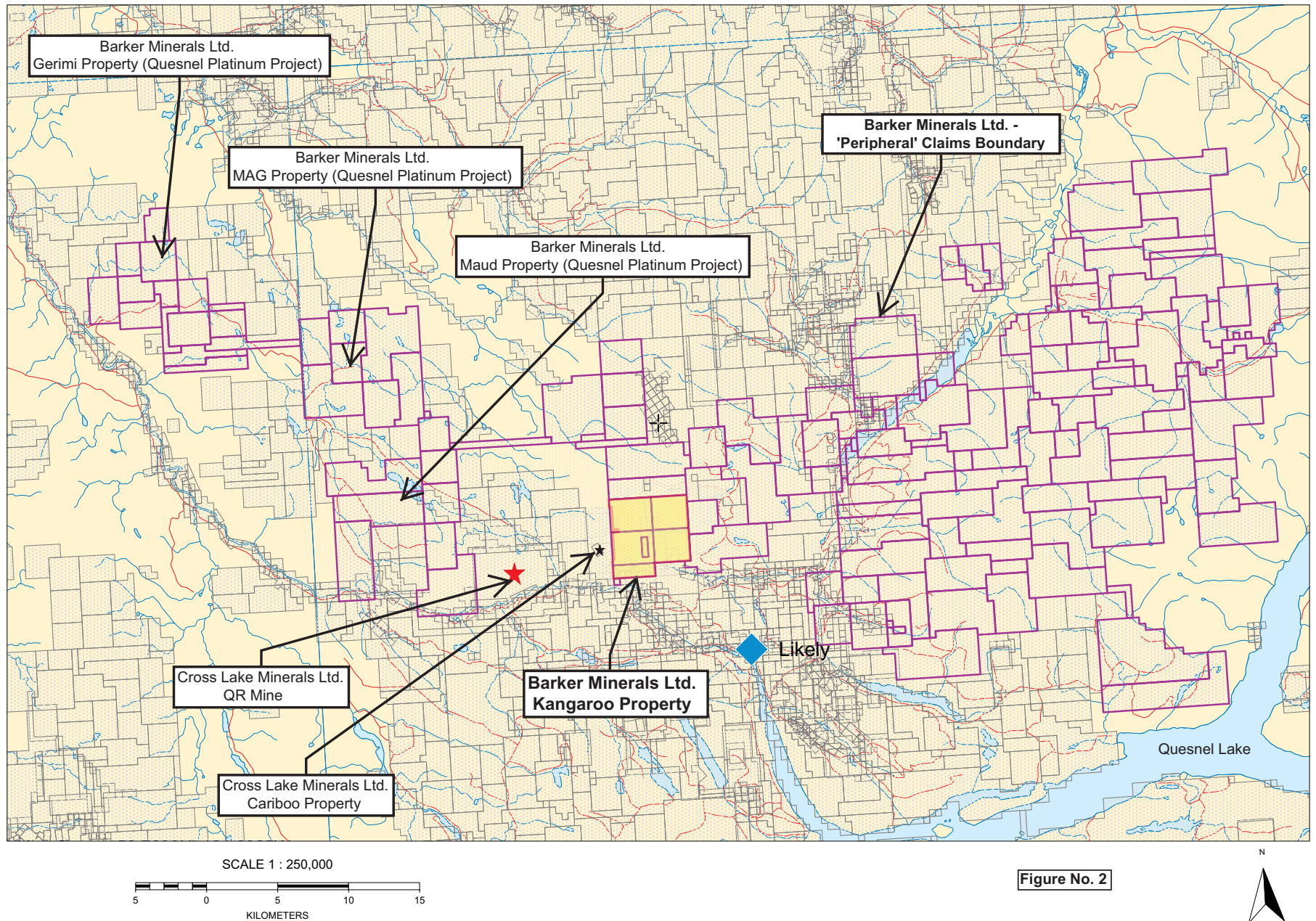
The Kangaroo Property consists of the mineral claim tenures listed in Table No. 1, acquired and maintained under Mineral Titles Online (MTO), British Columbia's internet-based mineral titles administration system.

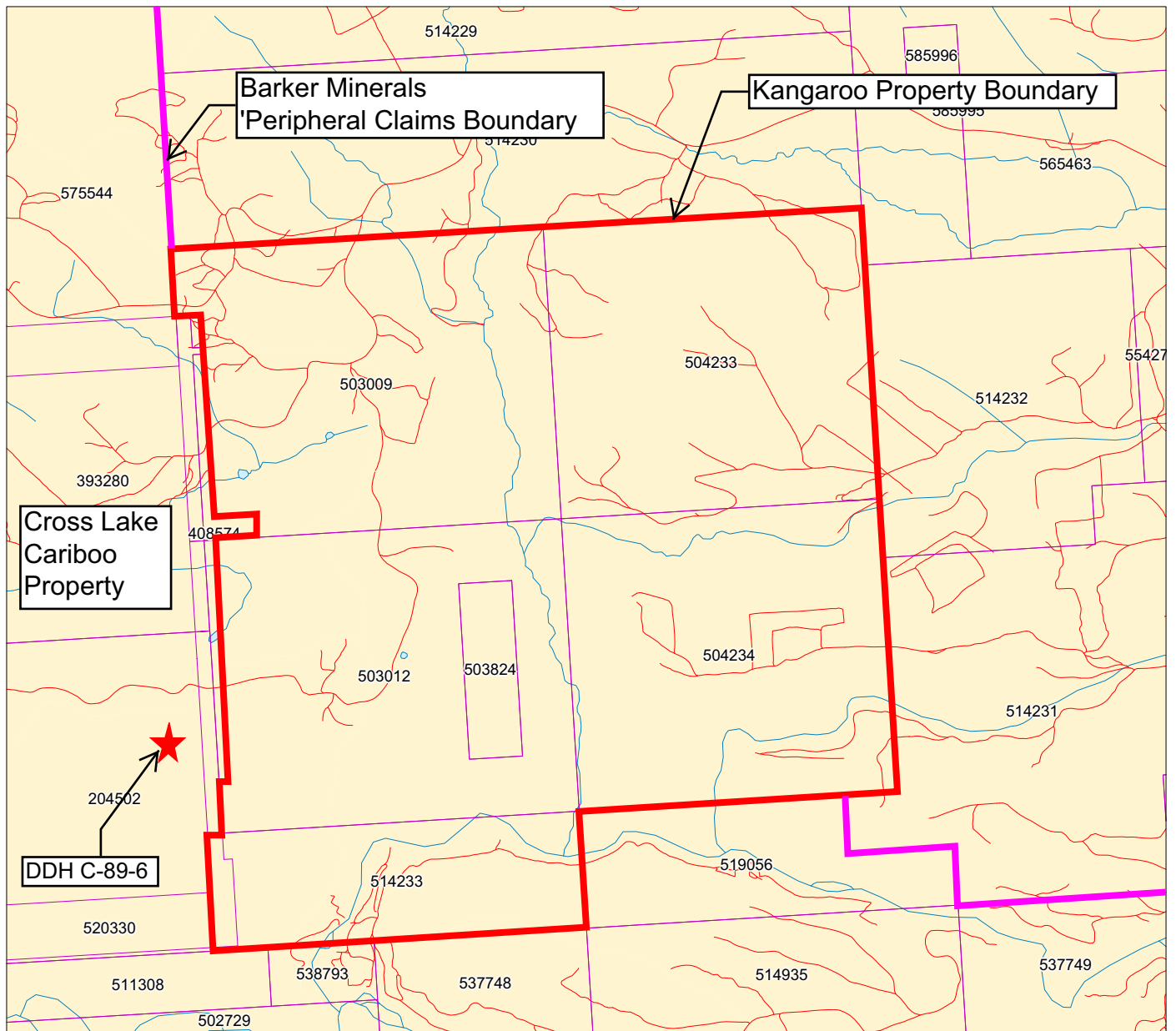
Barker Minerals Ltd. Property Location

British Columbia

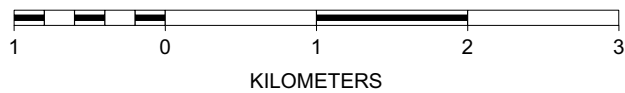


Barker Minerals Ltd. Mineral Claims





SCALE 1 : 50,000



Kangaroo Property

Figure No. 3

<u>Tenure Number</u>	<u>No. of Units</u>	<u>Owner</u>	<u>Good To Date</u>	<u>Status</u>	<u>Area (ha)</u>
503009	35	Barker Minerals Ltd. 100%	2009/Oct/31	Good	685.626
503012	32	Barker Minerals Ltd. 100%	2009/Oct/31	Good	627.162
503824	3	Barker Minerals Ltd. 100%	2009/Oct/31	Good	58.789
504233	30	Barker Minerals Ltd. 100%	2009/Oct/31	Good	587.627
504234	30	Barker Minerals Ltd. 100%	2009/Oct/31	Good	587.886
514233	14	Barker Minerals Ltd. 100%	2009/Oct/31	Good	274.471

Total area: 2,821 ha

Table No. 1 - Kangaroo Property Mineral Claim Details

The property is outlined in Figure No.3 Kangaroo Property. The mineral claims comprising the Property are located on the lower portions of Kangaroo Creek and Little Creek in the Cariboo Mining Division in British Columbia and are 100% owned by Barker Minerals Ltd. of Prince George, B.C.

The property is approximately 8 km northwest of the settlement of Likely and 90 km northeast the City of Williams Lake. The City of Prince George is 155 km to the north.

The geographic coordinates of the Property are:

52.67° North Latitude and 121.67° West Longitude or
590000 E and 5838000 N UTM coordinates (NAD 83).

The relevant map is: N.T.S. Map No. 93A/12.

Exploration work that has been conducted on the Kangaroo Property by Barker Minerals has been done under the Mineral Exploration and Reclamation Permit No. MX-10-212. The permit can be modified by amendments to allow future work. Barker Minerals has posted a security with the Province of B.C. in the amount of \$3,500 for reclamation purposes.

7.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE and PHYSIOGRAPHY

The closest large centre to the Barker Minerals project areas is Williams Lake located approximately 90 km to the southwest. Williams Lake is an intermediate-sized city and served by Highway 97, the B.C. Railway, a major hydroelectric power grid and a modern airport. By road, Likely is 65 km northeast of 150 Mile House on Highway 97. Access to Barker Minerals exploration areas, including the Kangaroo Property, is via gravel logging roads bearing northeast from Likely. The distance from Likely to Kangaroo is approximately 40 km by road. In Likely, Barker Minerals maintains a property that includes a house, a bunkhouse, a workshop and a large general-purpose tent and a core-cutting shack. The house serves as a field office.

The Kangaroo Property is situated in the central part of the Quesnel Highland between the eastern edge of the Interior Plateau and the western foothills of the Columbia Mountains. This

area contains rounded mountains that are transitional between the rolling plateaus to the west and the rugged Cariboo Mountains to the east. Pleistocene and Recent ice sheets flowed away from the high mountains to the east over these plateau carving U-shaped valleys. The elevation ranges from 750-1150 m.

Precipitation in the region is heavy, as rain in the summer and snow in the winter. Drainage is to the west via the Cariboo, Little and Quesnel Rivers to the Fraser River. Quesnel Lake, the main scenic and topographic feature in the region, is a deep, long, forked, glacier-carved lake with an outlet at 725 m elevation. Vegetation is old-growth spruce, fir, pine, hemlock and cedar forest in all but the alpine regions of the higher mountains. Weldwood has been actively logging fir, spruce and pine in the area, principally during winters. Snow can limit the work season to approximately May to November, but drilling can be conducted any time during the year if the access road is plowed clear.

8.0 HISTORY

Historical work programs done on areas presently covered by Barker Minerals' Kangaroo property are briefly described below.

8.1 Work Done in 1984.

The relevant report is Assessment Report 13160 by R.G. Simpson.

Work was done in 1984 for NCN Exploration and Development Corp. on the Tag, Tango and Cave claim groups consisting 95 claim units located between Kangaroo Mountain and Kangaroo Creek, approximately 4.5 km to the east. The economic target was for a bulk disseminated gold deposit.

Geological mapping was done and 303 soil samples were collected over 30.3 line km over a grid approximately 4 km x 5 km in area. This work was done in follow up to a regional airborne magnetic and VLF-EM geophysical survey done apparently over only the eastern part of the claim groups.

Lithologies consisted of various tuffs and breccia; laminated tuffs and argillite contained disseminated pyrrhotite and pyrite. Less common were massive basaltic flows. The airborne survey detected no significant anomalous magnetism and only 4 minor VLF-EM anomalies. Four of the soils were weakly anomalous in Au (40 ppb maximum value) and 9 soils were weakly anomalous in Ag (3.3 ppm maximum value). The results obtained were not considered worthy of further follow up.

8.2 Work Done in 1985.

The relevant report is Assessment Report 13865 by R.M. Durfeld.

Work was done in 1985 for Mt. Calvary Resources Ltd. on the Kangaroo claim group consisting 94 claim units named Jun and Rose. These claims were located on the east and west sides of

the lower part of Kangaroo Creek and were the north portion of their large Cariboo-Likely Project.

20 stream silts, 103 soils and 8 rock samples were collected. This work was done in follow up of a regional stream soil sampling program of the previous year. The soils were collected over 6 widely scattered small grids at locations of soil anomalies (Anomalies 1 – 6) from their 1984 regional program.

Anomaly 1 was a 1984 soil sample with 450 ppb Au. 39 soils collected here in the 1985 follow up had anomalous Cu, up to 259 ppm, and weakly anomalous Au, up to 40 ppb. This anomalous location was where Barker Minerals would in 2007 map the north boundary of a diorite intrusive (the Kangaroo stock) characterized by an approximately 1,000 m wide zone of low resistivity and high chargeability (Turna and Doyle, 2008). Mapping in 1985 here determined this Anomaly to be underlain by rhyolite and andesite intruded by mafic intrusive rocks.

Anomaly 2 (210 ppb Au in 1984) had only 5 soils collected over it in 1985 of which, the highest Au value was 35 ppb.

Follow up of Anomalies 3 to 6 returned sporadic, isolated, weakly anomalous Au, Cu, Ag or As. Anomaly 3 was explained as a placer concentration. The Au anomalies of the previous year at Anomalies 2,3 and 6 were not reproduced in 1985. Additional sampling was recommended at Anomalies 1, 4 and 5 to better define the anomalous trends of precious and pathfinder elements there.

Westenhiser Creek, flowing into Cariboo River approximately 1.5 km east of Kangaroo Creek, had 400 ppb Au in a stream silt. A narrow discontinuous quartz-sulphide vein sampled (Sample 26035) just upstream of this silt had 6,000 ppb Au, 13.5 ppm Ag, 18,951 ppm As, 2,044 ppm Cu. The upper part of this creek (called '69 Creek' in Turna and Doyle, 2008) was sampled at 4 locations by Barker Minerals in 2007. None of these silts were anomalous in Au. Thus it would appear that the location of Sample 26035 in the lower part of the creek is the source of the stream anomaly below. A soil sample collected in 2007 by Barker Minerals, approximately 1.3 km ESE of Sample 26035 was weakly anomalous in gold (35 ppb Au) and strongly anomalous in zinc (1,950 ppm Zn). Rocks here were very rusty siltstone adjacent to diorite; a rock sample here had 16 ppb Au and 274 ppm Zn. (Turna and Doyle, 2008, Fig. No. 46).

Additional prospecting was recommended in 1985 to expand the potential of this mineralized structure.

8.3 Work Done in 1986.

The relevant report is Assessment Report 15716 by A.J. Schmidt.

Work was done in 1986 for Mt. Calvary Resources Ltd. on the Rose, Spanish and Jun claim groups of their Cariboo-Likely Project consisting of 520 claim units.

Follow up work was done on Westenhiser Creek where in the previous year, rock Sample 26035 had gold (6,000 ppb Au). 104 soil samples were collected. Of these, 10 soils had 30 ppb Au or higher; 3 soils had Au values above 100 ppb, up to 180 ppb. Several anomalous soils were clustered on the eastern slope of the creek 150 m from the gold-bearing vein. The quartz-pyrite vein system was chip sampled; the best result was 1,140 ppb Au over 1.0 m. The occurrence was described as a mineralized shear zone, about 10 m wide, striking 100° and dipping vertically. Within the shear 3 quartz-pyrite veins, between 40 and 80 cm in width occurred with several 5-10 cm wide veins. The enclosing rocks were silicified argillites/siltstones. The gold values here were not considered significant and further follow up was not recommended. (Schmidt, 1986, pp 6,7).

8.4 Work Done in 2003

McKinley (2004) reports that:

[Barker Minerals] initiated a small reconnaissance exploration program on their Kangaroo Creek Project in November 2003. The goals of this work were to confirm the geological setting of the area and compare this with observations of previous workers and to assess if the geophysical anomalies identified on the Cross Lake [Cariboo] claims to the west trend onto the Barker Minerals claims.

A small IP and magnetic geophysical survey was conducted in November 2003 on the westernmost portion of Barker claim PG 9 by Peter E. Walcott & Associates of Vancouver, B.C. Three parallel lines spaced 100 metres apart and totalling about 5500 metres in length were surveyed ...Two main IP chargeability anomalies were identified, both of which appear to increase in intensity to the east. The larger northernmost anomaly corresponds to a resistivity low and is along strike from the large Cu-Mo-Au soil geochemical anomaly identified by Cross Lake. The southern anomaly appears to be along strike of Cross Lake's anomalous Au-Cu-As-Sb geochemical trend as well as the ground that hosts the historical gold-mineralized interval [5.26 g/t Au over 8.5 m] intersected by Corona in 1989 in drill hole C89-6. The zones having high resistivity with coincidental magnetic highs likely represent the intrusive rocks identified in outcrop nearby.

8.5 Work Done in 2005

Barker Minerals did reconnaissance soil sampling and magnetometer surveys adjacent to an intrusive body, later the area of the 2007 work program. 473 soil samples were collected on 6 lines at various orientations labelled KTL1 to KTL6 and on the 3 lines labelled KL0, KL1 and KL2 on which the 2003 IP survey was done. This work was not included in the Assessment of Barkers Minerals' group of claims, however results from the 2005 soil sampling are discussed with the 2007 sampling in this report (see also Sections 8.6 and 12.2).

The southern portions of Lines labelled KL0, KL1 and KL2 were strongly anomalous in Au, As and multi-element pathfinders. Drill hole K07-5 tested this area in 2007. Scattered anomalous Au (up to 3,320 ppb over 1.50 m) and chalcopyrite mineralization occurred over almost the entire hole (261 m). Multi-element anomalies, including Au, also occurred on reconnaissance lines farther east, on the south side of the intrusive body. Drill holes K07-6 and 7 targeted this area in 2007. The magnetometer survey was done along approximately 2.0 km on the main road crossing the area. The middle third of the road traverse was determined to be anomalously magnetic. In 2007 this zone was targeted by drill holes K07-8 and 9.

8.6 Work Done in 2007

Drilling and geophysical work are described in Assessment Report 29740 by Turna and Doyle, (2008). A soil survey was done after the assessment period and results were not included in the assessment report. These soil survey results are provided in this report (Section 12.2).

The diamond drilling program was done on the Kangaroo property to follow up high chargeability and low resistivity anomalies from the IP survey done in 2003, and anomalous soils collected in 2005. Nine holes 2,008 (metres) were drilled. 915 core samples were collected, 57 rock samples, 46 soils and 21 stream sediment samples were collected. Geological mapping was done over approximately 2.5 square kilometres in the general area of the drilling. 40 km (nominal length) of grid lines were established on the property. Stations were placed every 25 metres on the grid lines. Quantec Geoscience Inc. did a pole-dipole induced polarization (IP) survey over 32.0 km on this grid and a Titan-24 IP survey over 8.0 km. Approximately 605 soil sample were collected over the western half (Lines KL0 to KL11) of this grid during the winter before being suspended due to weather.

Soils over the Kangaroo stock and the adjacent alteration aureole in sedimentary rocks are anomalous in Au, Cu, Mo and other elements. The area of the Au soil anomaly over the soil survey is approximately 1 km x 2 km and remains open to the east and south. The eastern portion of the soil survey should be completed before a comprehensive interpretation is made.

The IP survey determined a low resistivity anomaly extends approximately 1,000 m from the north side of the stock, and a high chargeability zone associated with the intrusive extends for approximately 500 m north from the intrusive. Zones of high chargeability and low resistivity occur on the north and south sides of the intrusive. Generally the north side anomalies are the more intense and extensive.

In the drilling program, spotty high Au values (up to 15,700 ppb Au over 1.51 m in hole K07-1) occurred in several holes.

9.0 GEOLOGICAL SETTING

9.1 Regional Geology

The geological descriptions in this Section derive mainly from Struik (1988), Panteleyev et al. (1996) and Payne and Perry (2001); these authors are quoted extensively.

The western Canadian Cordillera is made up of a number of terranes representing crustal blocks of fundamentally contrasting histories. The terranes are commonly bounded by faults and trench complexes or collisional suture zones.

The fundamental geologic components that make up the terranes are referred to as 'tectonic assemblages'. The assemblages represent rocks deposited in specific tectonic settings during certain periods of time and, therefore, are commonly bounded by unconformities or faults. They represent distinctive successions of stratified rocks and other characteristic lithologies, mainly coeval metamorphic, plutonic and ultramafic rocks. The assemblages are categorized in terms of their predominant depositional setting or position relative to the orogen, for example, island arc, back arc, ocean basin or continent-margin foredeep clastic wedge or passive-margin sediment, and so forth. Tectonic assemblages are commonly named after their principal constituent formation, group or region in which the assemblage is best described. During the mid-Jurassic the North American continental plate collided with a group of island arcs to the west.

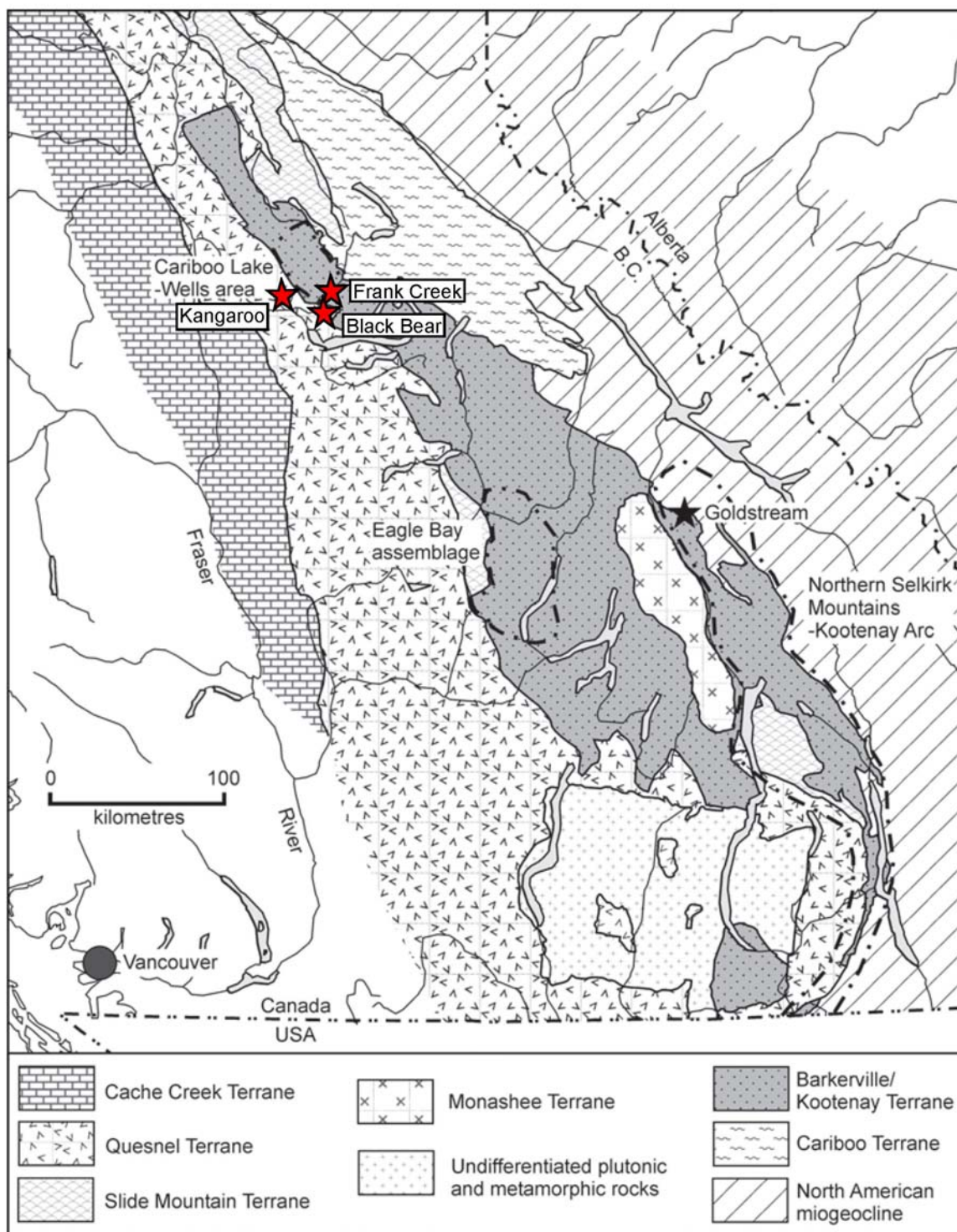


Figure No. 4 Terrane Map of Southern British Columbia. Barker Minerals' properties are indicated by red stars. The black star (Goldstream) is a massive sulphide deposit where production from 1983 to 1996 by then owner Imperial Metals Corp. totalled 2,224,387 tonnes yielding 26,228 kg Ag, 78,269 tonnes Cu and 7,988 tonnes Zn (BCGS Minfile 082M 141).

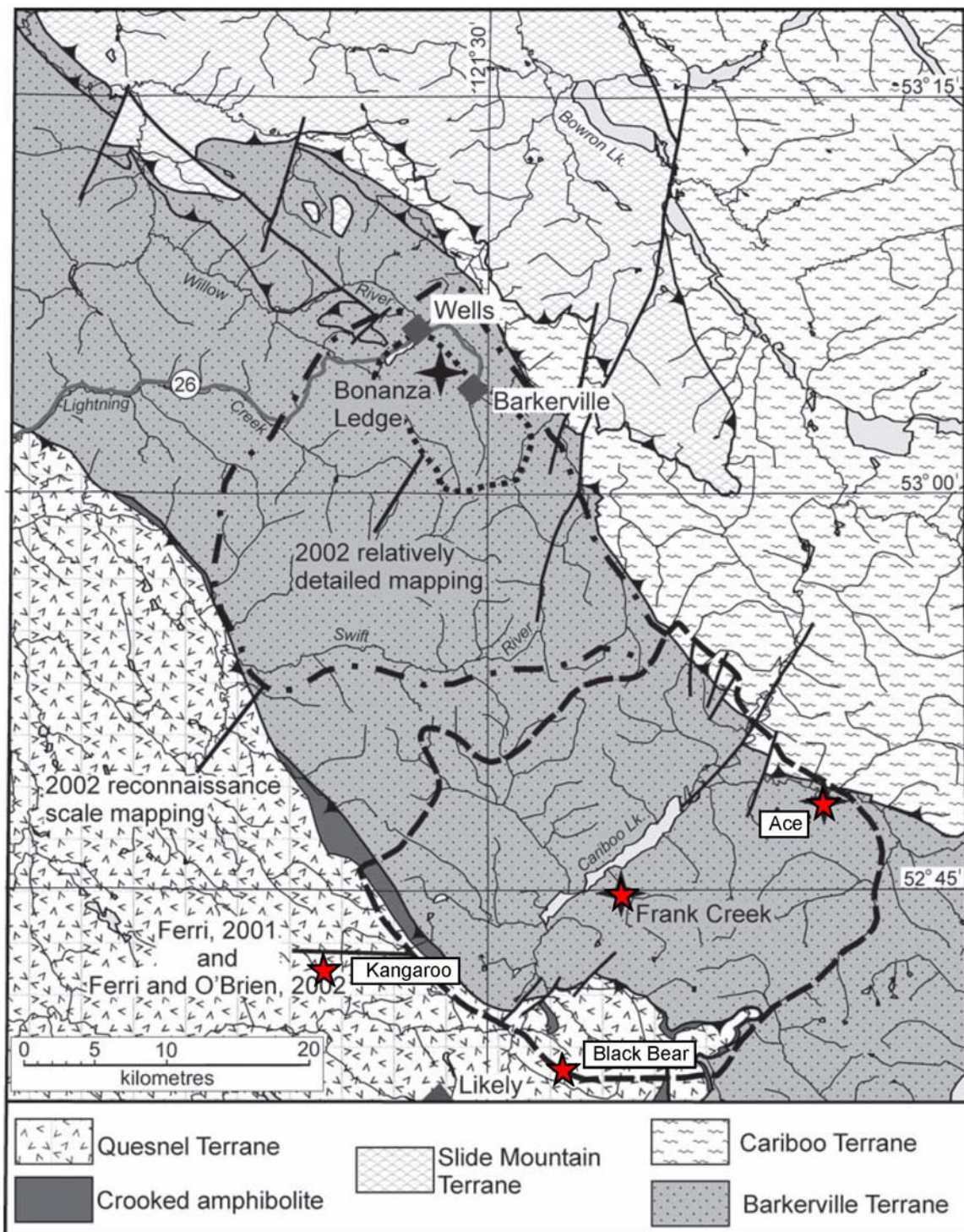


Figure No. 5 Terrane Map of Cariboo Lake – Wells Area showing areas mapped by BCGS in 2000 – 2002. Barker Minerals' properties are indicated by red stars.

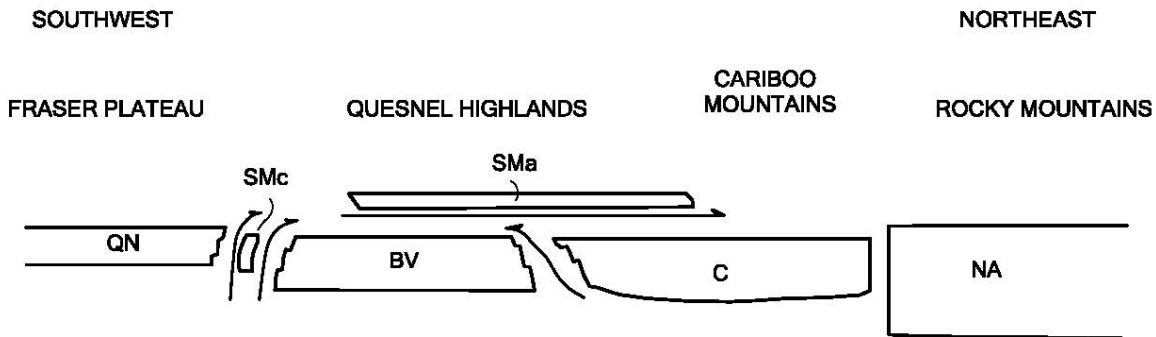


Figure No. 6 Schematic Regional Structural Section from southwest to northeast across the four Terranes in Barker Minerals' claims area, showing the relative structural position of the Terranes. The Terrane symbols are BV-Barkerville, C-Cariboo, Sma-Slide Mountain (Antler Formation), SMc-Slide Mountain (Crooked amphibolite), QN-Quesnel and NA-North American. (after Struik, 1988).

Quesnel Terrane

The Quesnel terrane was accreted to the North American continent during the Late Triassic to Early Jurassic. The Eureka thrust fault marks the boundary between the Quesnel and Barkerville terranes. The terrane is partly submarine and partly subaerial, consisting of volcanic and volcanoclastic rocks and co-magmatic intrusions, with minor carbonate lenses and related sedimentary rocks.

The principal assemblage in the Quesnel Terrane is the Triassic-Jurassic Nicola island arc – marginal basin sequence. The underlying rocks are the Crooked amphibolite, part of the Slide Mountain assemblage, a mylonitized mafic and ultramafic unit of oceanic marginal basin volcanic and sedimentary rocks. Rocks of Quesnel Terrane and Crooked amphibolite are structurally coupled and tectonically emplaced by the Eureka Thrust onto the Barkerville Terrane, to the east.

Two lithostratigraphic subdivisions of the Quesnel Terrane consists of a basal Middle to Late Triassic metasedimentary unit of dominantly black phyllitic rocks, approximately 7 km thick, and an overlying Late Triassic to Early Jurassic volcanic arc assemblage, approximately 9 km thick. The overlying volcanic rocks outline a northwesterly trending belt of subaqueous and subaerial volcanic rocks, deposited along a series of volcanic-intrusive centres that define the Quesnel island arc of predominantly alkalic basalts.

The Quesnel Trough is a well-mineralized region typical of other Late Triassic to Early Jurassic volcano-plutonic island arcs in the Cordillera. It hosts a wide variety of mineral deposits. The principal recent exploration and economic development targets in the central Quesnel belt are alkalic intrusion-related porphyry copper-gold deposits and gold-bearing propylitic alteration

zones formed in volcanic rocks peripheral to some of the intrusions. Other important targets are auriferous quartz veins in the black phyllite metasedimentary succession. The veins in some black phyllite members have potential to be mined as large tonnage, low-grade deposits. Tertiary rocks are mineralized with copper and gold. Antimony-arsenic and mercury mineralization in some apparently low temperature quartz-calcite veins indicated the potential for epithermal deposits. Placer mining for gold, said to occur together with platinum, has been of major historical and economic importance.

Slide Mountain Terrane

Rocks of the Devonian to Late Triassic Slide Mountain Terrane were partly obducted, partly subducted during collision of an oceanic plate with the continent. Small slices of mainly mafic volcanic rocks and ultramafic rocks of the Slide Mountain Terrane occur in and parallel to the Eureka thrust. Minor lithologies include chert, meta-siltstone and argillite.

The Crooked amphibolite, considered likely a part of the Slide Mountain Terrane, includes three major constituent rock types: greenstone, metagabbro and meta-ultramafite. North of Quesnel Lake, the map units consist of mafic metavolcanics, amphibolite, chlorite schist, serpentinite, ultramafic rocks and pillow lavas. Chemical analyses indicate subalkaline tholeiitic compositions of basalts formed on the ocean floor. If the Crooked amphibolite is a sheared and metamorphosed equivalent of the Antler Formation and is part of the Slide Mountain Terrane, it is separated from the underlying Barkerville Terrane by the Eureka thrust, a wide zone of mylonitization. The Crooked amphibolite and the overlying rocks of Quesnel Terrane are structurally coupled and emplaced tectonically onto Barkerville Terrane.

Barkerville Terrane

The Barkerville Terrane is made up of the Snowshoe Group and Quesnel Lake gneiss. The Snowshoe rocks are Upper Proterozoic to Upper Devonian metasediments, considered correlative in age with Eagle Bay rocks of the Kootenay Terrane to the south and Yukon-Tanana Terrane to the north. The Snowshoe rocks are dominated by varieties of grit, quartzite, pelite, limestone and volcanoclastic rocks. The stratigraphic sequence is not well understood. The region was deformed by intense, complex, in part isoclinal folding and overturning. Locally, strong shear deformation produced mylonitic textures. The Quesnel Lake gneiss is a Devonian to Mississippian intrusive unit varying in composition from diorite to granite to syenite. It is generally coarse grained, leucocratic, often with megacrysts of potassium feldspar. The main body of gneiss is 30 km long by 3 km wide and is elongated parallel to the eastern border of the Intermontane belt. Its contacts are in part concordant with, and in part perpendicular to, metamorphic layering.

The contact between the Barkerville Terrane and Cariboo Terrane to the east is the Pleasant Valley Thrust. The Barkerville and Cariboo Terranes were juxtaposed prior to emplacement of the Slide Mountain Terrane which was thrust over both of them. The northeastern third of the Barkerville Terrane is the main zone of economic interest in the Cariboo district. Struik described it as "gold-enriched", because it contains the historic Wells and Barkerville mines and

the Cariboo Hudson deposit, approximately 40 km and 20 km northwest of the project area, respectively.

Cariboo Terrane

The northeastern part of Barker Minerals' 'Peripheral' claim group is underlain by Precambrian to Permo-Triassic marine peri-cratonic sedimentary strata of the Cariboo terrane. The Cariboo Terrane consists mainly of limestone and dolomite with lesser siliceous, clastic, sedimentary rocks and argillite. Some geologists believe that the Cariboo Terrane is a shallow, near-shore facies and the Barkerville is a deeper, offshore facies of the same erosion-deposition system. No rifting is suspected between the Cariboo Terrane and the North American continent, in contrast to that between the Barkerville Terrane and the North American continent. Lithologies within the Cariboo Terrane correlate well with parts of the Cassiar Platform and Selwyn Basin of Yukon and northern British Columbia.

The Cariboo and Barkerville Terranes are separated by the regional Pleasant Valley thrust fault, which dips moderately to steeply northeast. Struik (1988) states the Cariboo block was thrust from the east over the Barkerville block along a strike length of over 100 km. The Cariboo Terrane was cut by the Jurassic-Cretaceous Little River stock, a medium-grained granodiorite grading to quartz monzonite. Some of the carbonate layers in the lowest part of the Cariboo terrane (or upper part of the Barkerville Terrane) are enriched in zinc and lead. Since the 1970's, preliminary exploration on stratiform Zn-Pb targets has been conducted in this area.

Glaciation and glacial deposits

The last glacial stage that affected the Quesnel Highland, the Fraser glaciation, began 30,000 years ago. Much of this ice had melted by 10,000 years ago, but small remnants are preserved high in the alpine areas of the Cariboo Mountains. At lower elevations, glaciers of this age scoured the debris left by preceding ice advances, almost completely destroying them, leaving a chaotic assemblage of unsorted till, moraine and drift, with lenses of gravel and sand that had been roughly sorted by melt water and rivers, leaving behind beds of silt and clay that were stratified by settlement in ice-dammed lakes. In the Cariboo area, the debris covers bedrock in valleys below 1,700 m, leaving typical glacial features such as U-shaped valleys, ice-sculpted drumlins, moraine terraces and glacier and river benches. On the Barker Minerals properties, glacial deposits range from one to a few tens of metres thick. Some glacial till deposits are overlain by well-bedded glaciolacustrine clay and silt deposits up to a few tens of metres thick.

In much of the Cariboo district, a layer of distinctive, hard, compact, semi-rigid blue clay sits either on or slightly above bedrock and acts as "false" bedrock. It was formed from glacial drift left behind by the last ice advance prior to the Fraser glaciation and was compacted by the weight of the Fraser stage ice. In the placer-gold areas of the Cariboo, large amounts of gold were recovered from gravel resting on this clay. In places the clay layer was penetrated by the placer miners to reach richer "pay streaks" on true bedrock below.

9.2 Local Geology

Geological mapping and drilling on the Kangaroo Property in 2007 determined basalt and siltstones were intruded by a multimodal intrusive stock, consisting of gabbro, diorite and monzodiorite, lithologies similar to that at the QR gold mine, 8.0 km WSW of the Kangaroo Property. The stock at Kangaroo (1.0 km x 1.8 km) is similar in size to the QR stock (1.0 km x 1.5 km) at the QR mine; both stocks' long dimension is in the E-W direction.

The diorite intrusive at Kangaroo has an elongate NE-SW shape whose northern boundary grid coordinates occur at approximately 1400N. The southern boundary grid coordinates varies between approximately 600N and 1300N as the intrusive appears to thin toward the NE.

Lithologies

The most common rock type encountered in the drill holes was fine grained siltstone and andesite. Colour varies from light to dark grey, relatively rare graphitic versions are blackish. Fine bedding occurs commonly, with relatively uncommon fine sandstone interbeds. The siltstones are locally intensely fractured, weakly welded back together with chlorite. No significant graded bedding was observed. Andesitic volcanoclastics are often interbedded with the siltstones. These are mainly distinguished by a coarser texture and a somewhat lighter and greenish grey colour due to higher chlorite content.

Basalt occurred mostly in DDH holes K07-1 and K07-2 in the western area and DDH holes K07-8 and K07-9 eastward in the main area of the intrusive. The western basalts are more brecciated and sometimes amygdaloidal and are considered to be lavas or otherwise extrusives. The eastern basalts are often difficult to characterize, some may be dikes and fine grained chilled intrusive rock.

Diorite or porphyritic gabbro intrusive rocks were encountered in most DDH holes. These are medium to fairly coarse grained in the case of the porphyritic rocks. Colour varies from light to dark grey, some of the coarser gabbro are rather leucocratic or light coloured. The larger phenocrysts are augite, sometimes up to approximately 10 mm. Monzodiorite was identified in thin sections of core specimens from DDH hole K07-6. Some of the monzodiorite contained pink coloured monzonite xenoliths.

Structure

Siltstones in outcrops in the 2007 work area have bedding that strike NW, N and NE and steep dips eastward or westward. These attitudes suggest the presence of a syncline whose NW-SE to N-S axis occurs in the vicinity of east end of the intrusive body.

The manner in which the diorite and gabbro occur in core and outcrops in the western area suggests these may be, in part, sills.

10.0 DEPOSIT TYPES

Barker Minerals is exploring the Kangaroo Property for intrusion-related gold. In the 2007 drill program skarn and vein-type chalcopyrite and Au mineralization occurred preferentially in calcareous basalts but also in calcareous and silicified siltstones and in veinlets in the dioritic porphyry. Results from an initial soil sampling program in 2007 indicate anomalous Au, with Cu, Mo and As, in soils occur over the intrusive body and a certain distance into the intruded siltstones and basalts. Possible Au deposit forms at Kangaroo can be proximal, intermediate and distal to the mineralizing intrusion similar to that shown in Figure No. 7 below.

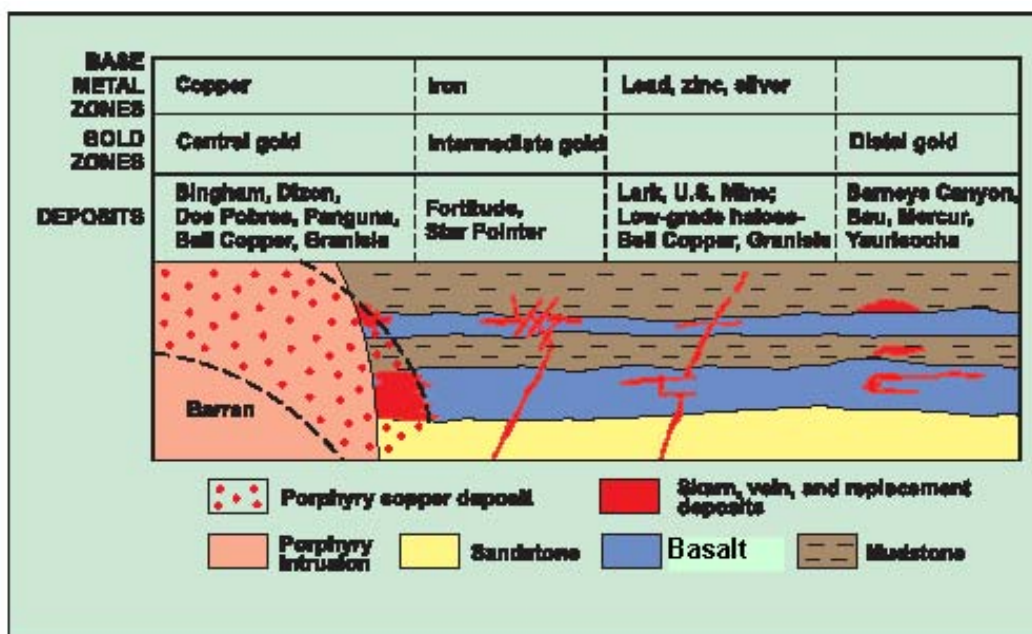


Figure No. 7 Generalized Zoning Model for Au-Enriched Porphyry Cu Systems.
(modified from Sinclair (2004) after Jones, (1992)).

The QR gold mine, 8.0 km WSW of the Kangaroo Property, is considered by the BCGS as a type example of an Au skarn (BCGS deposit type K04). At the QR mine Au mineralization occurs mainly stratabound in basalt adjacent to overlying sediments and near the alteration front a certain distance from a diorite intrusive. The QR example is considered to be the most likely model for Kangaroo. Intrusion-related Au pyrrhotite veins, (BCGS deposit type I02), is also in consideration at Kangaroo due to the very common occurrence of pyrrhotite, disseminated and veined in most rock types, and massive in hornfelsic skarn. The occurrence of anomalous Au in veinlets in the intrusive and in soils over it, and anomalous Cu and Mo in soils over and adjacent to the intrusive suggest the possibility of a porphyry Cu±Mo±Au (BCGS deposit type L04) related model. The British Columbia Geological Survey deposit types under consideration at Kangaroo are discussed in detail in Appendix A – B.C. Geological Survey Deposit Types.

A 'propylite model' was proposed by Panteleyev et al (1996, pg 80-83) in their discussion of the QR deposit. They considered the unusual aspects of the style of mineralization in the propylite model sets it apart from other gold skarns and deserve to be identified as a deposit type that is distinct from the gold skarn model. Their description of the Propylite Model had the QR Deposit specifically in mind; it is quoted *in italics* below.

The Propylite Model

Rock Types: *Epidote and pyrite-rich auriferous propylitic alteration (epidote-chlorite-tremolite-calcite and rare garnet), with minor other sulphide minerals, occurs as lithologically controlled, conformable replacement zones within a thermal aureole adjacent to an intrusive body. Host rocks are hornfels and epidote-rich propylite derived from mafic volcanics, commonly with alkalic (shoshonitic) compositions, mafic tuffs and volcanic sandstones and calcareous mudstone. Intrusions are generally small, zoned stocks with diorite to syenite compositions. Their age is similar to, or slightly younger than, their host rock alkalic volcanics. Feldspathic hornblende porphyry dikes and sills are common. The stocks exhibit little alteration but have a weakly developed porphyry copper-style mineralization. Related dikes and sills in the mineralized zones external to the stock may be more extensively hydrothermally altered than the main intrusion.*

Mineralization and Alteration: *Propylitic zones with auriferous pyrite occur within the propylitic alteration aureole. The better grades are generally at the outer periphery of the propylitic alteration zone, commonly at lithologic unit or bedding contacts. Tabular, conformable mantos may form in permeable beds and units, commonly along the contact between hornfels or other less permeable rocks and the propylitic fragmental volcanic rocks. Faults or other, older structural features may be mineralized and form ore zones that are transgressive to strata.*

Pervasive propylitic alteration of the matrix and clast rims of fragmental volcanic rocks is characterized by disseminated grains or intergrowths of epidote with chlorite, calcite, tremolite, quartz, albitic plagioclase, clinozoisite and rare andradite garnet. Calcite is abundant peripheral to the propylitic alteration zone and in the mudstone beds. Fracture controlled quartz-sericite-pyrite zones may occur in subordinate amounts.

Granular pyrite-epidote-calcite aggregates replace the matrix of the volcanoclastic rocks and clast rims. Locally pods and lenses contain up to 80% pyrite and other rare sulphide grains. Pyrite also occurs as fracture coatings, seams and veinlets with calcite and epidote. It is the predominant sulphide mineral; the ore mineral is gold. Subordinate minerals are chalcopyrite, pyrrhotite, sphalerite and marcasite with minor galena, and arsenopyrite. Magnetite may be present as a constituent in some sulphide-rich bands. Gangue minerals in addition to the abundant epidote, chlorite and calcite are tremolite, quartz, clinozoisite and rare andradite garnet. Permeability in the volcanoclastic rock is a fundamental ore control; secondary controls are tectonic breccias, faults and fracture zones that provide additional fluid flow paths.

Chemically reactive hostrocks containing calcite, sulphide minerals or devitrified glass may cause ore deposition by chemically buffering the hydrothermal solutions.

Origin: The QR deposit is related to a small, relatively “dry-looking”, zoned alkalic stock. Fox (1989, 1991) has described the deposit as a “failed” porphyry system. He suggests that the gold is transported by a magmatic-source low density, low-salinity fluid rich in CO₂. The writers consider the deposit to be a product of a small geothermal cell with an evolving hydrothermal fluid. A magmatically derived fluid interacted with meteoric water and the mixture evolved, probably through fluid wallrock interaction with the chemically reactive calcareous siltstones. Melling et al. (1990) provide isotopic data that are consistent with older porphyry copper magmatic systems but some modification in carbon by wallrock interaction is indicated. The early alteration is associated with calcite (note the zeolite mineral wairakite should form in this environment but has not been recognized), then the CO₂-depleted fluid reacts with the basalts to form propylite – mainly epidote, pyrite, chlorite and (?) tremolite with rare andradite garnet. This is not a retrogressively altered skarn because maximum temperatures of mineralization appear to be in the order of 200 to 300°C. This low temperature produces prograde propylite mineral assemblages without any substantial amount of calc-silicate and silicate minerals typical of gold skarns such as garnet, pyroxene, wollastonite, vesuvianite, axinite, potassium-feldspar and biotite.

Exploration Guides: A distinctly anomalous geochemical signature of gold, arsenic, silver and copper are typically associated with the ore. Pathfinder elements in the hydrothermally altered rocks include zinc, molybdenum, vanadium, antimony and possibly lead, cadmium, bismuth, cobalt, magnesium and iron (Fox et al., 1987). Glacial till, soil and vegetation exploration geochemistry have been used effectively in this region of extensive glacial dispersion. Magnetic surveys have been effective exploration tools. Aeromagnetic highs can be used to detect the presence of intrusions, mainly the magnetite-rich dioritic stocks with which the propylitic alteration is associated. Some of the porphyry copper mineralization contains abundant hydrothermally derived magnetite.

Genetically affiliated mineralization may be manifest as intrusion-related auriferous vein, replacement and pyrite-sericite stockworks, manto and skarn deposits and porphyry copper-gold or porphyry gold deposits, all in propylitic settings. Other deposits with similarities to the QR deposit are the 66 zone at the Milligan porphyry copper-gold deposit in British Columbia, and elsewhere the mantos such as Candelaria and Punta del Cobre, Chile.

Discussion: The QR deposit (and propylite gold deposits in general) appear to be related to mineralization by a (relatively) small volume of ‘ponded hydrothermal fluid’ related to emplacement of a small alkalic stock. There has been considerable interaction with (‘buffering’ by) the basaltic country rock to form abundant epidote and pyrite but no substantial amount of skarn. The hydrothermal system exemplifies a lithologically and structurally controlled mineralizing process in which adjacent permeable and impermeable lithologies form a fluid trap against a small, mineralizing intrusion. The West Zone, on the other hand, is largely a structural trap and forms a discrete copper-rich zone.

This type of propylitic alteration can be considered to be a subtype of skarn mineralization – a prograde, low-temperature, auriferous epidote skarn. Unusual aspects that set the propylite model apart from other auriferous skarns are (G.E. Ray, personal communication, 1994): the association with alkalic rocks; the large amount of epidote with lack of pyroxene and only trace of garnet; mineralization with pyrite, lesser magnetite and rare pyrrhotite suggesting an oxidized ore fluid; the high gold to silver ratio and overall low copper content.

This style of mineralization deserves to be identified as a deposit type that is distinct from the gold skarn model largely because it represents a new exploration opportunity. The mineralization has an unspectacular appearance in outcrop and generally has not been highly regarded as an exploration prospect. Many pyritic propylite occurrences, especially those in porphyry copper districts, might have been excluded from further investigation of their gold content.

11.0 MINERALIZATION

Mineralization

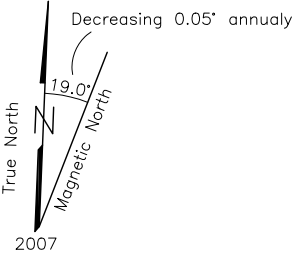
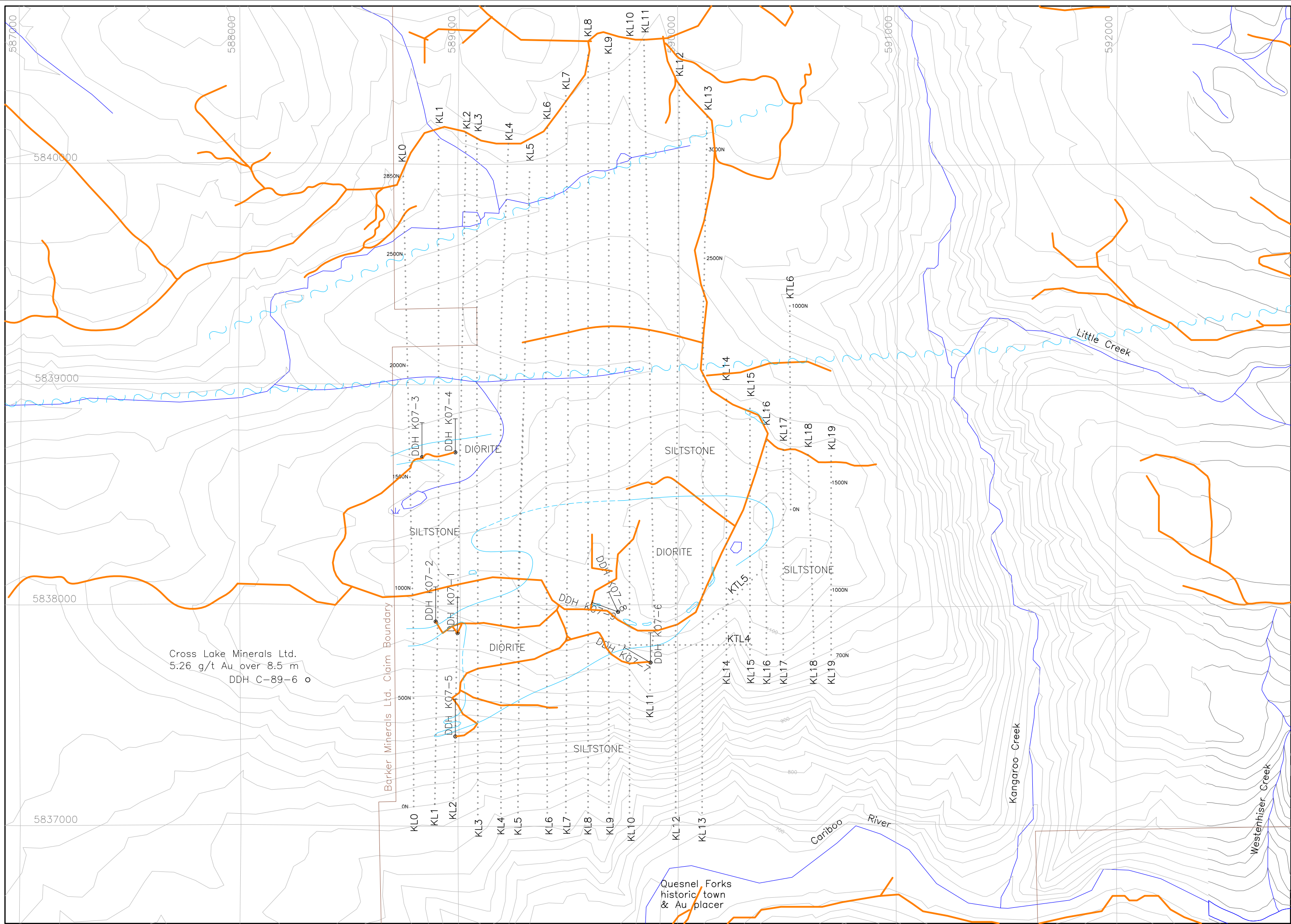
At Kangaroo Property, pyrite and pyrrhotite occur disseminated in all rocks and in blebs and irregular narrow sulphide veins in the siltstones and basalt and in the intrusive rocks. The siltstones are usually rusty with reddish and yellowish brown gossan. Some fine sandy layers in the siltstones appear to be preferentially mineralized with sulphides 'stratabound' on a small scale. Massive pyrrhotite with chalcopyrite and pyrite occur in dark hornfelsic rock near intrusive contacts in drill holes K07-2 and K07-4. Generally sulphides are greater near intrusive contacts, more abundant in the intruded rather than the intrusive rocks. Pyrrhotite is responsible for the magnetic quality of rocks commonly observed in core and outcrop. Magnetite was rarely identified.

Alteration

Pervasive calcite occurs very commonly in the basalts, and in the siltstones and volcanoclastics. Occasionally diorite fizzed with acid, this was mainly due to the presence of fine calcite veinlets. Pervasive sericite occurs commonly in the intruded rocks, more intensely in gouge zones. Chlorite alteration is common, usually concentrated in chloritic fractures in the siltstones. Epidote is patchily common but rarely more than in trace amounts. The siltstones are generally siliceous. Secondary pervasive silica alteration occurs locally and can be confused with the primary silica in siltstones. Very dark hornfelsic rock occurs with massive pyrrhotite in DDH holes K07-2 and K07-4.

Veins

Calcite veins predominate over quartz veins in the drill holes. Blebby pyrrhotite and pyrite occur with the veins, mainly at selvages. These sulphides and chalcopyrite also occur in narrow sulphide veins and irregularly disseminated in the siltstones and basalts.

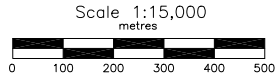


LEGEND

- Topographic Contour & Elevation
Contour interval 20 metres
- Creek, Pond, Swamp
- Road
- Outcrop
- Geological contact
(approximate, inferred)
- Probable Fault

Drillhole Location & Number
DDH K07-9

UTM Coordinate System
Map Datum: NAD 83
Zone: 10



BARKER MINERALS LTD.

KANGAROO PROPERTY
SAMPLING GRID AREA
and GEOLOGY

Cariboo Mining Division, B.C.

NTS Mapsheet: 93 A/12	Date: March 19, 2009
Drawn by: RT	Fig.No. 8

12.0 EXPLORATION

12.1 2007 'Conventional' Pole-Dipole and Titan-24 IP Geophysical Surveys

40 km (nominal length) of grid lines were established on the Property in 2007 and stations were placed every 25 m along the lines. The lines were oriented north-south, were spaced 100 m apart and averaged approximately 2,500 m to 3,000 m long. Quantec Geoscience Inc. did a 'conventional' pole-dipole induced polarization (IP) survey over 32.0 km of this grid and a partially overlapping Titan-24 IP survey over 8.0 km. The Titan-24 survey was done on Lines KL2, KL4, KL6. The 'conventional' IP survey was done on Lines KL3, KL5, KL7 and the succeeding 12 lines eastward to KL19. The purpose of the overlap was to compare the results obtained with the two systems over the same area and assess the desirability of using the deeper 'seeing' ability of the Titan-24 method in possible future surveys.

The small Titan-24 survey produced similar interpretation results as the 'conventional' IP survey, though 'seeing' to a greater depth.

The following discussion of the 'conventional' IP survey refers to the geology map (Figure No. 8) and the 3D geophysical sections (Figure Nos. 9 and 10).

Two topographic features, linear valleys occupied by straight-running creeks, are obvious on topographic maps. These evidently indicate the traces of faults. The southern valley, or fault, runs approximately E-W and has a grid northing of about 2000N. The northern valley, or fault, runs approximately NE-SW and has a grid northing of about 2500N on Line KLO to about 3000N on Line KL13.

The south fault marks the location of the Sub-vertical Low Resistivity Zone of the Central Terrain in Figure Nos. 9 and 10. This line also marks the chargeability front approximately 600 m north of the intrusive. The north fault, a prominent topographic linear, does not generally have an obvious geophysical signature and is not coincident nor parallel with the nearby resistivity front which marks the boundary between the North and Central Terrains in Figure Nos. 9 and 10.

The boundary between the Central Terrain and South Terrain of Figure Nos. 9 and 10 occurs at approximately 1400N grid coordinate. This coincides with the northern edge of the diorite intrusive. The South Terrain is underlain by the intrusive which is extensively mineralized with disseminated pyrite and pyrrhotite. The intrusive is generally characterized by high chargeability, especially near its northern edge, and high resistivity, though a significant low resistivity zone coincides with chargeability Zone B near the intrusive's northern edge. Zones of high chargeability and low resistivity occur on the south side of the intrusive but generally are not as intense or extensive as on the north side.

The Central and North Terrains are underlain by siltstones and less commonly, basalts. The Central Terrain extends from the northern edge of the intrusive, at approximately 1400N, to approximately 2300N to 2500N. The northern boundary of the Central Terrain does not appear

to coincide with any topographic or geologic feature, other than seeming to be parallel to the south fault linear in the middle of the Central Terrain and the intrusive contact farther south.

The Central Terrain is divided into northern and southern halves by the Sub-vertical Low Resistivity Zone (south fault). The southern half is characterized low resistivity and high chargeability. The geology here consists of intensely rusty siltstones heavily mineralized by disseminated, stringer and locally massive pyrrhotite, pyrite and minor chalcopyrite. This is the Zone A chargeability anomaly in Figure No. 10. The northern half of the Central Terrain is characterized low resistivity and low chargeability. The geology here is unknown due to lack of outcrop but is likely to be siltstone similar to the southern half. The north boundary of the Central Terrain appears to coincide with a low resistivity front, approximately 500 m north of the south fault.

The North Terrain is characterized by high resistivity and low chargeability. Exceptions are a low resistivity surface veneer consistent with non-chargeable overburden and local weak chargeable zones. Due to lack of outcrop the geology here is not known.

Figure Nos. 9 and 10 below include discussions of the results of the 2007 'conventional' IP survey from the Quantec Geoscience report by G.J.R. Warne, (2009).

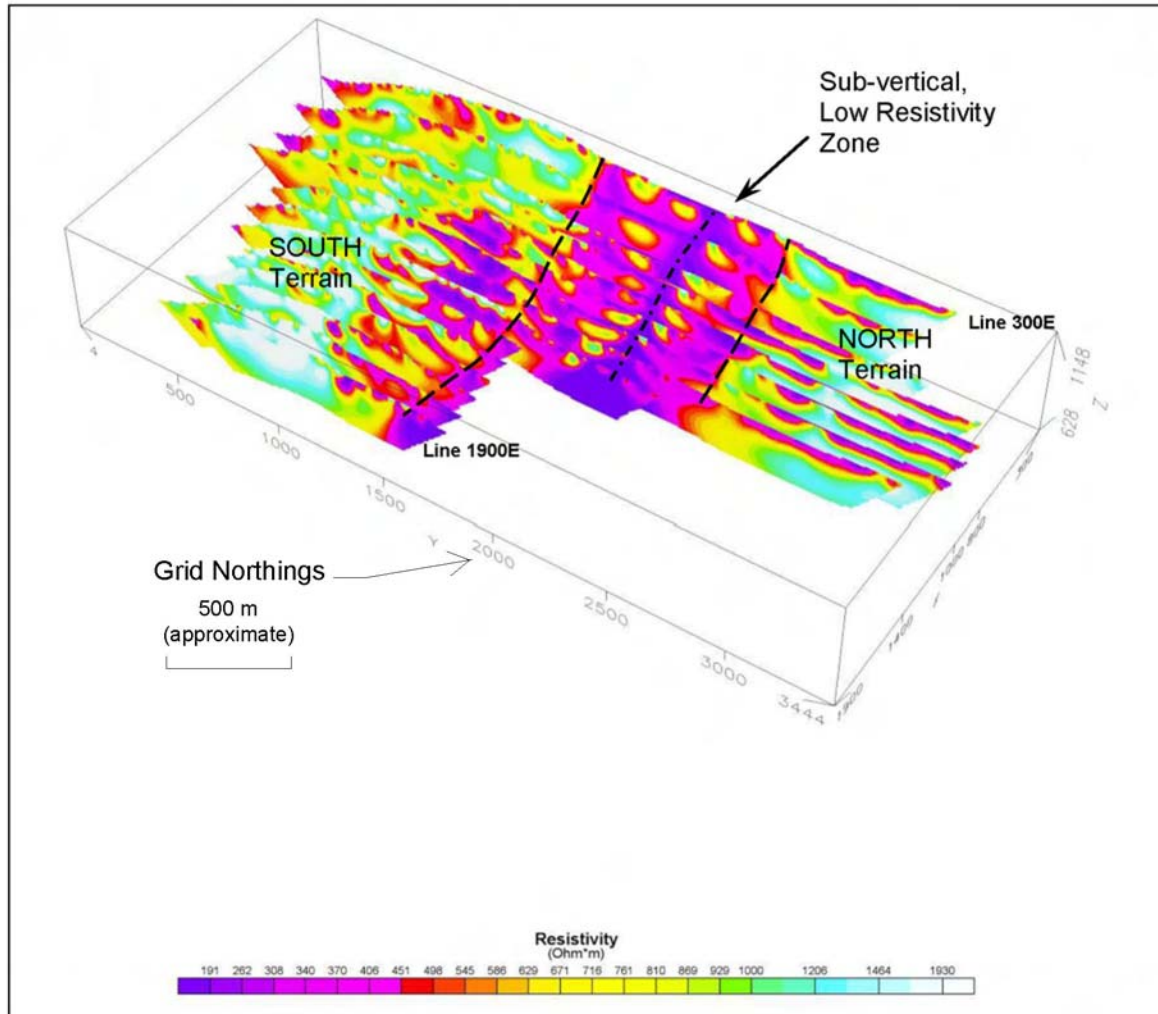


Figure No. 9 3D Perspective Resistivity Sections – Viewed from Northeast. *The Resistivity distribution underlying the Kangaroo property suggests sub-division of the property into 3 Resistivity terrains, North, Central and South, delimited by roughly east-west boundaries. A thin, lower resistivity veneer, most likely overburden soils, overlies most of the North terrain. The boundary between the North and Central terrains is reasonably well defined by the south limit of the resistive material underlying the North terrain. The Central terrain is characterized by a broad zone of resistivity...extending in depth, and centered about a more localized, well defined low resistivity zone trending east to west across the property. The zone appears to have a sub-vertical orientation...The boundary between the Central and South Terrains is not clearly defined everywhere...The location and orientation shown should be considered arbitrary and tentative. (Warne, G.J.R., 2009).*

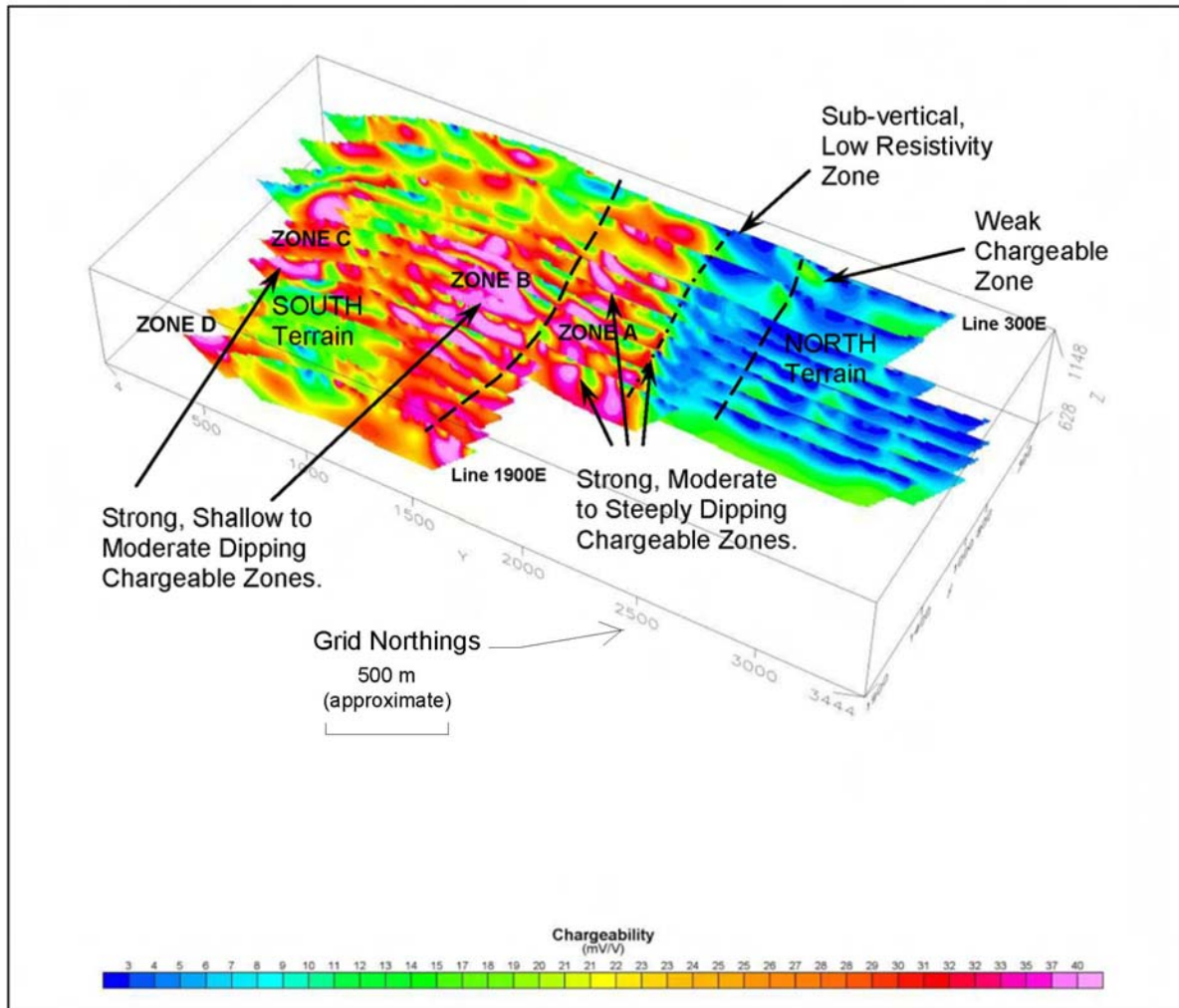


Figure No. 10 3D Perspective Chargeability Sections – Viewed from Northeast. Sizable strong Chargeability anomalies occur within the Central Resistivity terrain. These are identified as Zone A. Anomalies in Zone A are predominantly...moderate to steeply dipping zones, many of which appear to extend from a core concentration...underlying lines 1000E to 1100E at approximately 1700N. Zone A is clearly bounded to the north by the low Resistivity feature about which the Central terrain is centred. Local reduced resistivity...typically coincide with the chargeable zones. Zone A remains open to the east of line 1300E, beyond the north extent of lines 1400E to 1900E. The chargeability anomalies within the South terrain are predominantly delineated as shallow to moderately dipping zones, identified as Zones B, C and D. Zone B features sizable strong Chargeability anomalies, portions of which extend to the surface, particularly across lines 1000E to 1200E. The zone may plunge at shallow angle toward the north-east. Zone C features strong sizable Chargeability anomalies located toward the south end of the property. The most sizeable anomalies are located underlying line 800E, from 500N to 600N, and line 1300E from 400N to 600N. The survey coverage has not extended sufficiently to the south to fully resolve Zone C on lines 1000E through 1400E. The chargeability anomalies typically exhibit coincident local resistivity low signatures, or occur along margins of low resistivity regions. Delineation of Zone D is incomplete. (Warne, G.J.R., 2009).

12.2 2007 Soil Survey

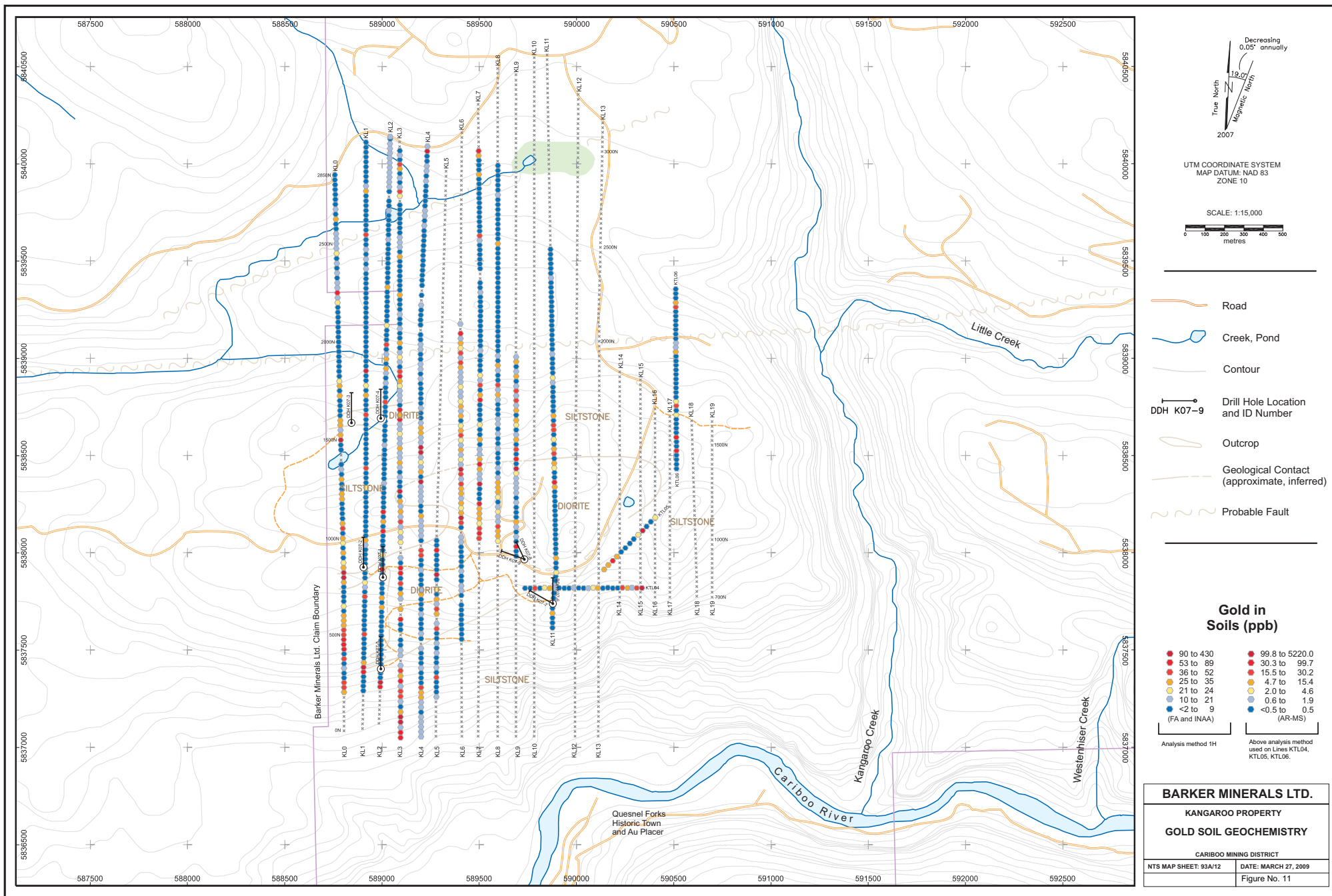
Maps in this report present soil sampling results from the 2005 and 2007 surveys. The 2005 soil lines were originally labelled KTL1 to 6 and KL0 to 2. In 2007 Lines KTL1 and 2 were relabelled as Line KL5 and Line KTL3 was relabelled as Line KL11.

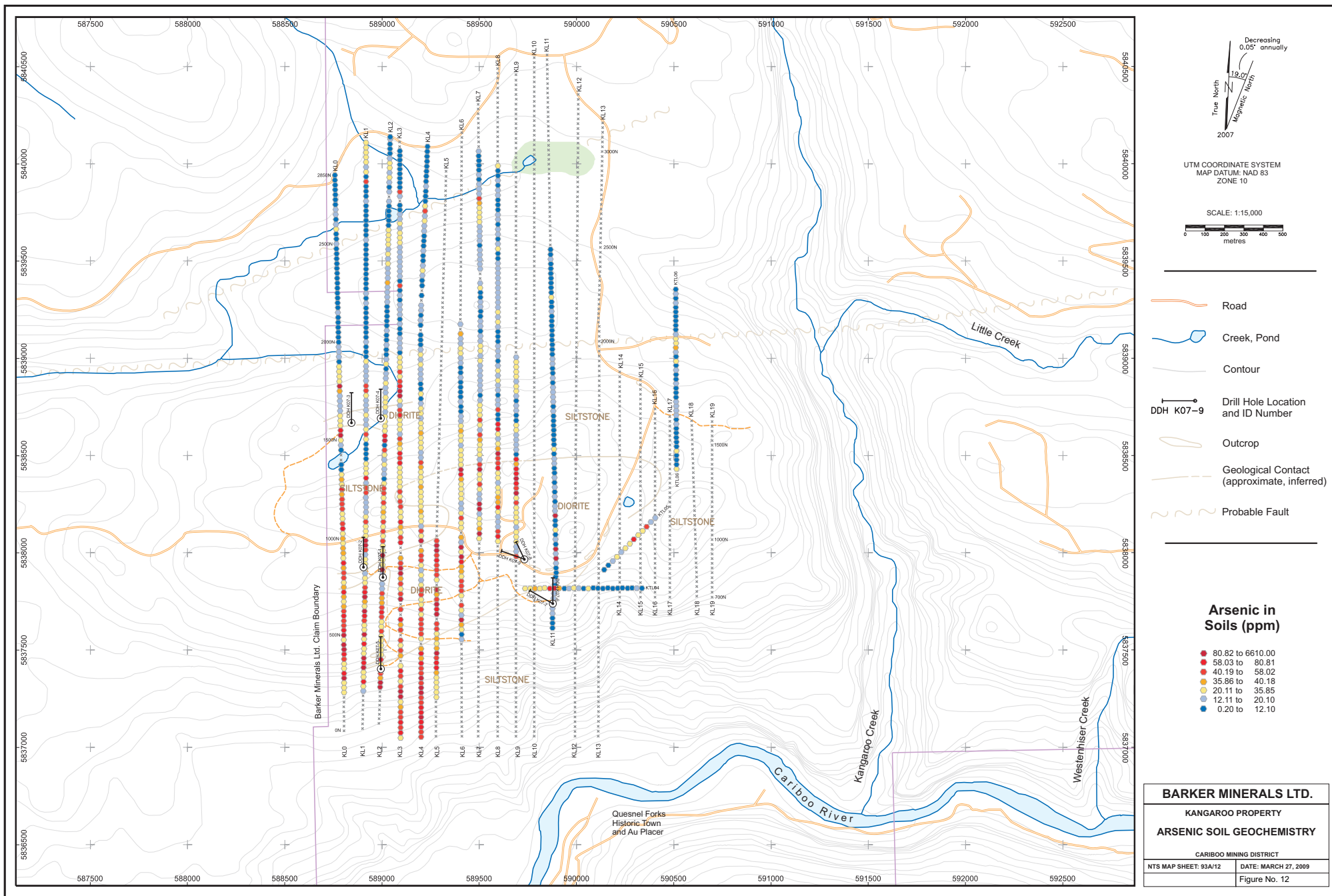
The 2007 soil survey was only about half completed before being suspended during the winter.

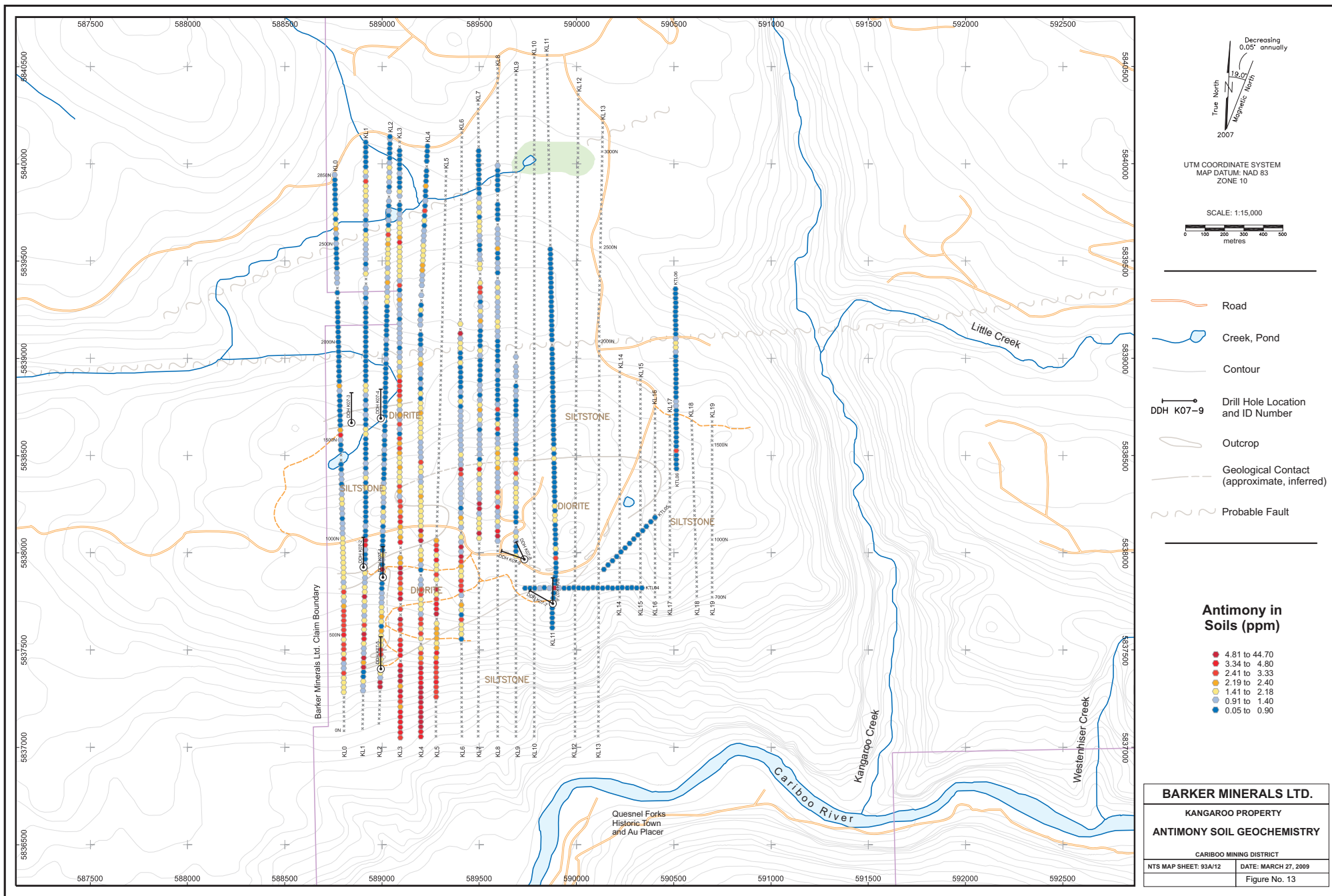
Maps (Figure Nos. 11-17) below, show the soil geochemistries for Au, As, Sb, Cu, Zn, Pb and Mo. Au is anomalous over the area of the intrusive and the altered siltstones north of it almost to the south fault line. Highly anomalous Au values occur on the southwestern part of the grid near the south end of Lines KL0, KL1 KL2 and KL3. The cause of this anomaly is not yet determined. Cu and Zn are anomalous with Au over the intrusive and its north side, and the southwest area. Mo is anomalous over the intrusive and north of it, especially on the western lines. This anomaly seems to thin eastward until Lines KL6, KL7 and KL8 which have relatively weak scattered anomalous Mo. As and Sb are anomalous with Au over the intrusive, north of it toward the south fault, and the southwestern area. Pb is anomalous over relatively restricted areas, between the intrusive and the south fault, between the north and south faults, and in the southwestern area.

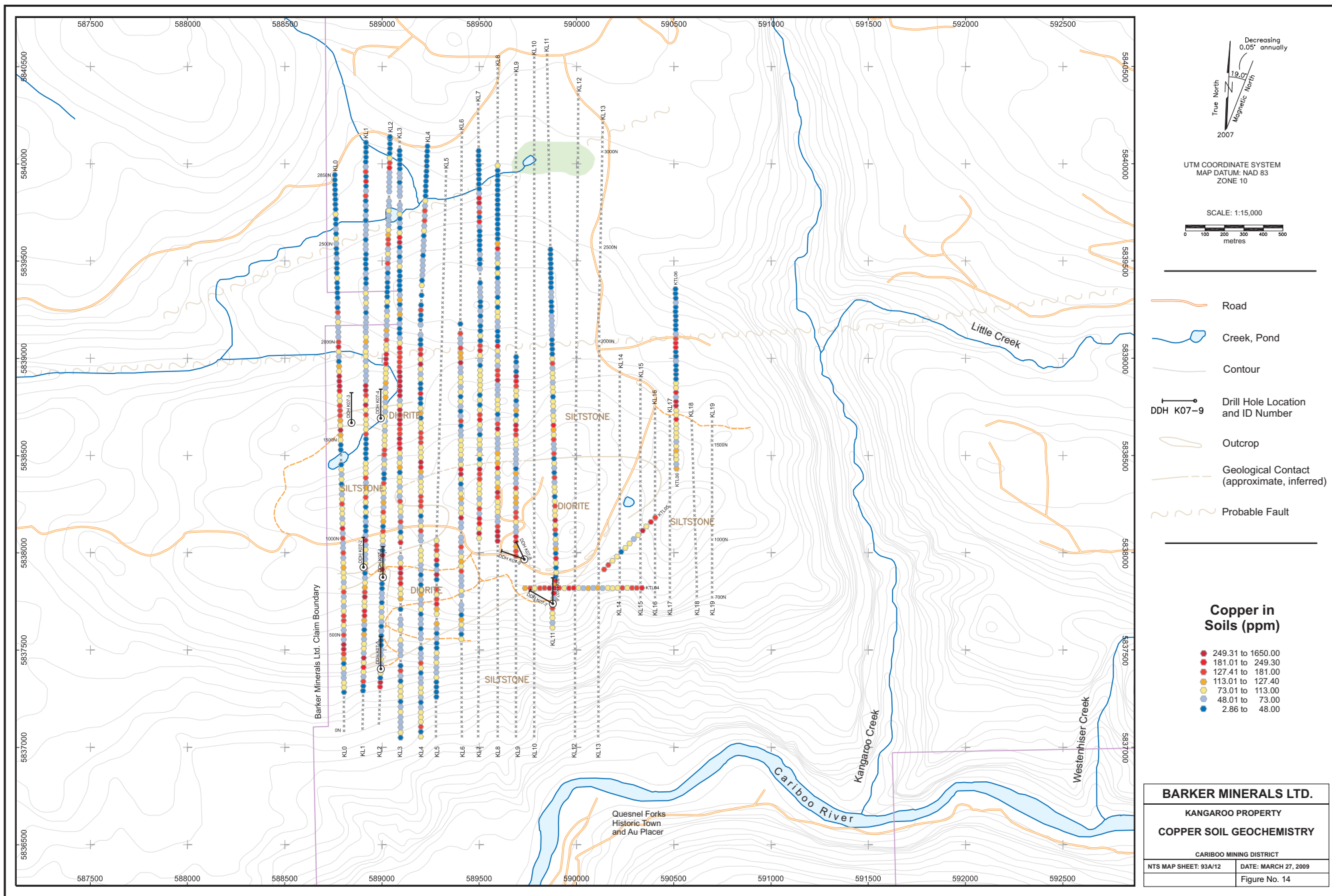
It appears the intrusive and the adjacent alteration aureole in sedimentary rocks, especially on the north side, are anomalous in Au, Cu, Mo and other elements. There appears a possible zonation to the soil anomalies but further geological mapping and completion of the soil sampling over the eastern half of the grid is required before a comprehensive interpretation is done.

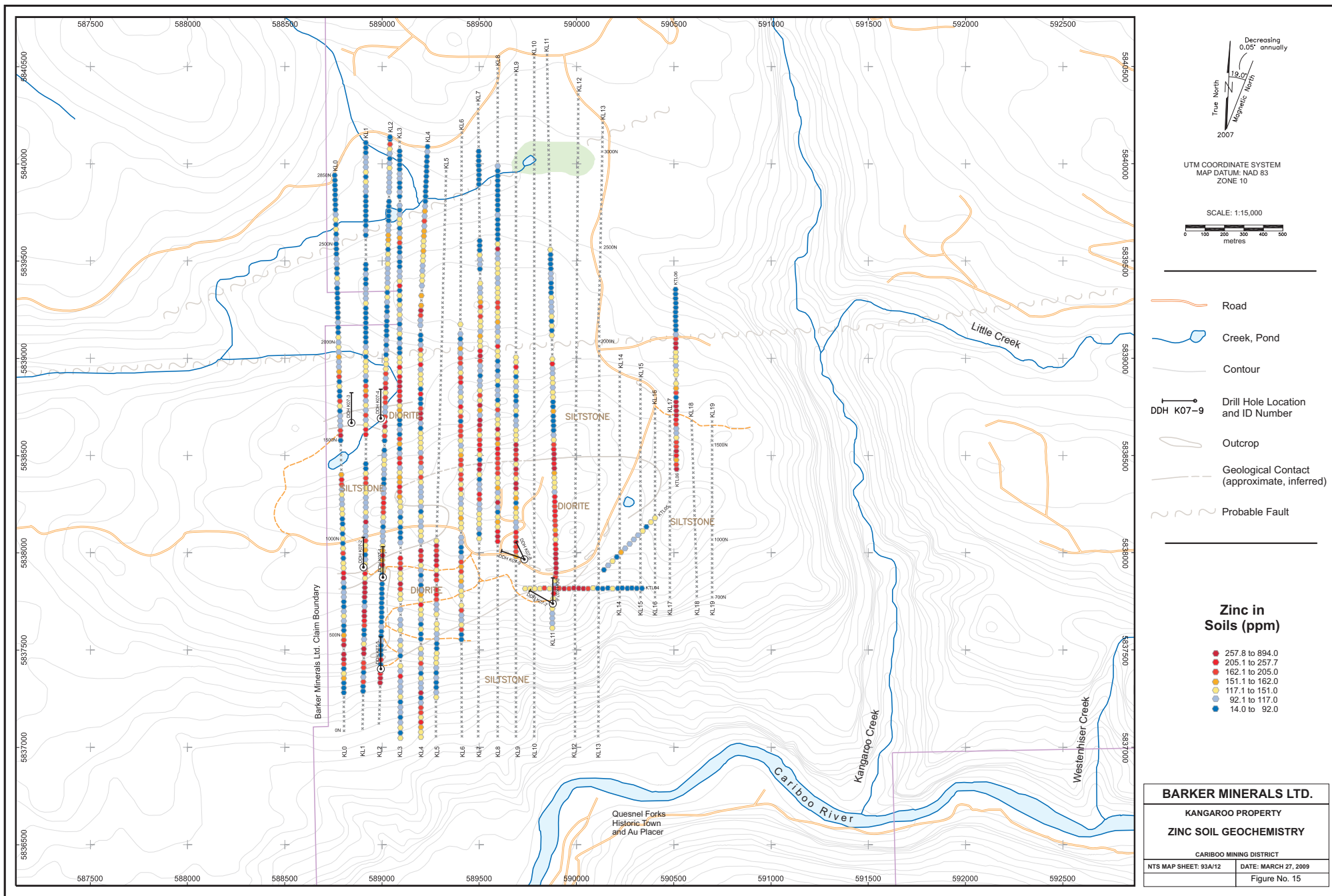
The southwestern area, highly anomalous in Au, As and other elements, on Barker Minerals' property, is on strike with Cross Lake Minerals' prominent Au-As-Sb soil anomaly on their Cariboo property's East Grid. The Cross Lake anomaly trends SE off their grid toward Barker's southwest anomaly, located 500 m SE. These anomalies appear to be on the same trend and may represent a significant Au-bearing structure with a distinct and prominent Au-As-Sb geochemical signature.



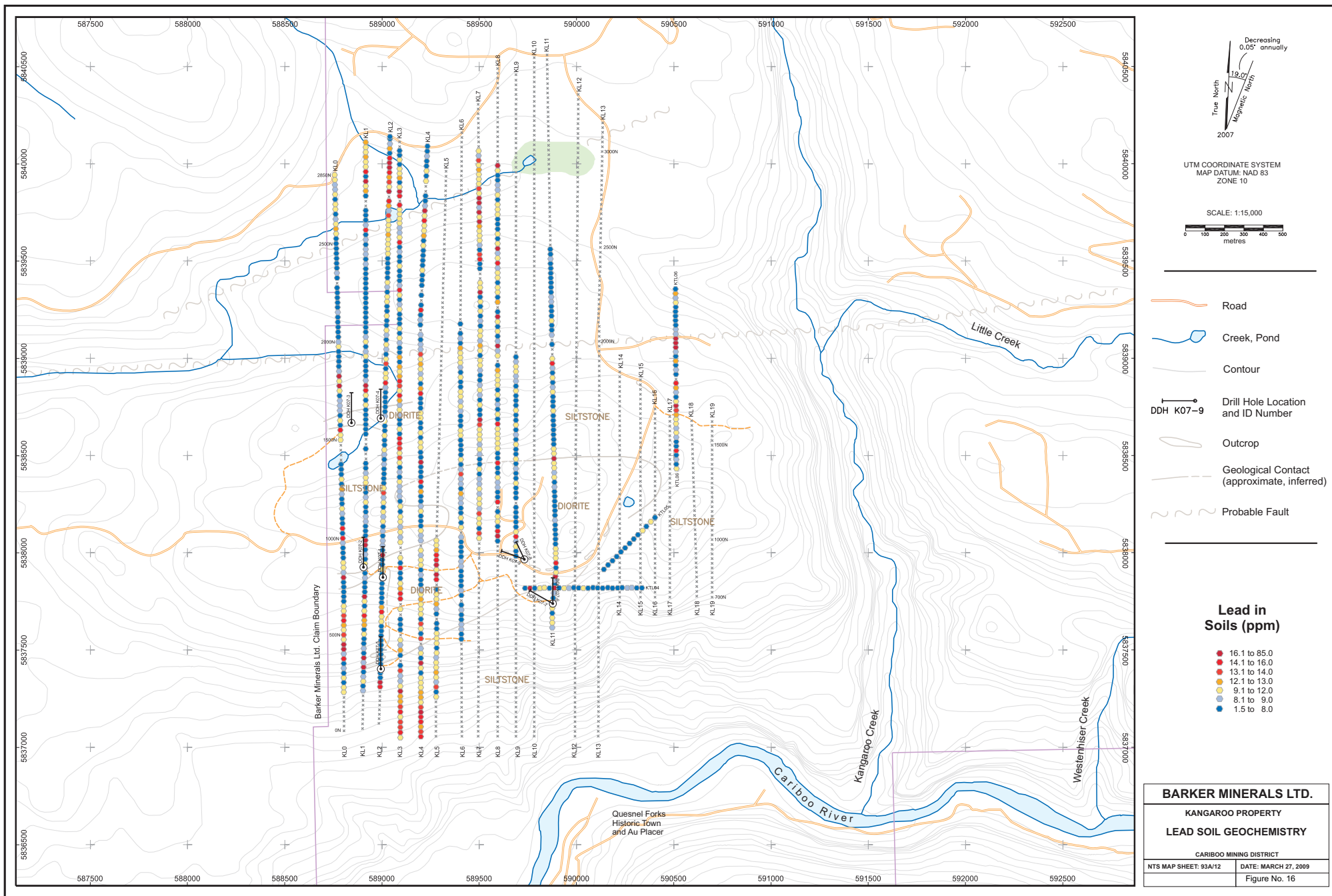


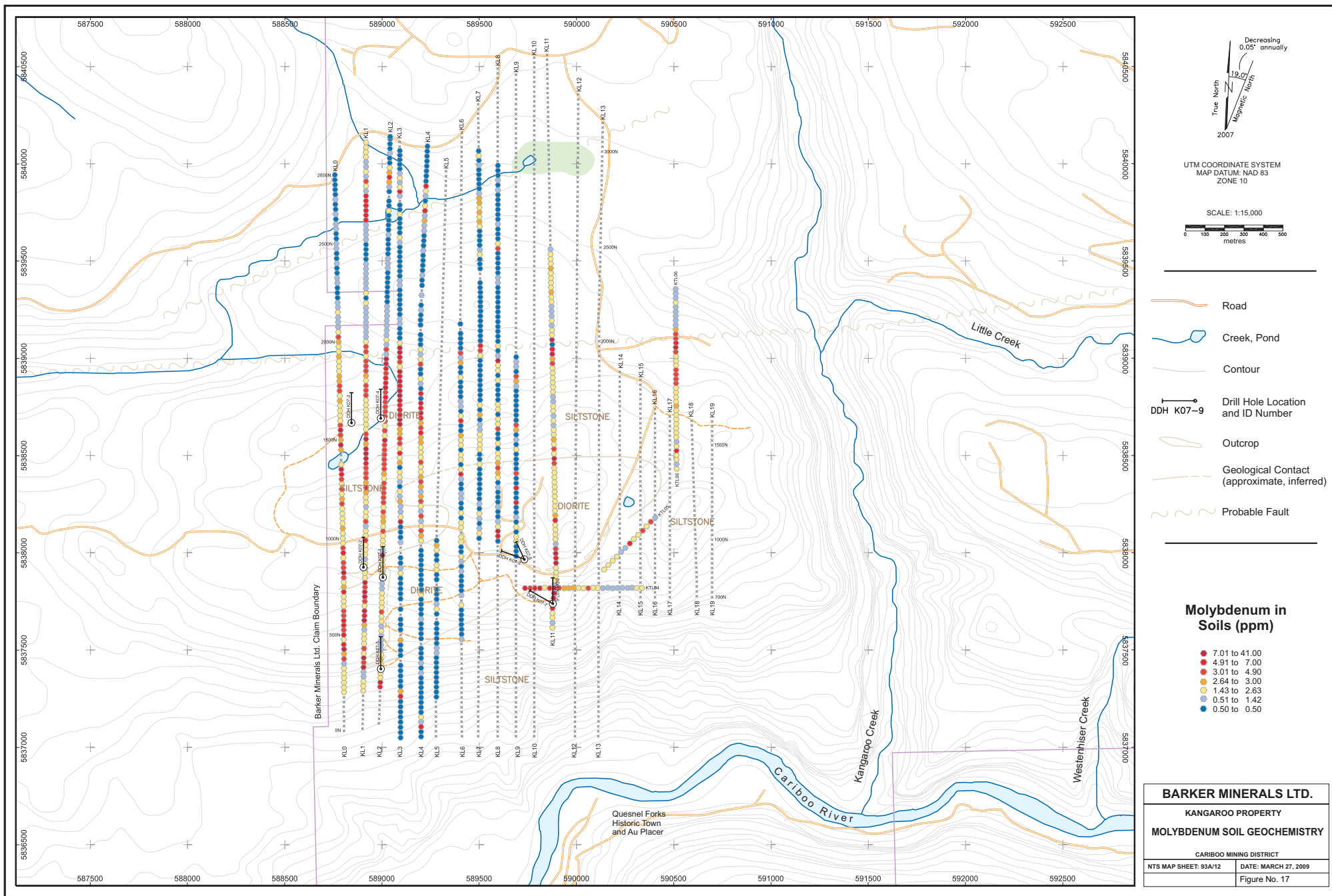






BARKER MINERALS LTD.	
KANGAROO PROPERTY	
ZINC SOIL GEOCHEMISTRY	
CARIBOO MINING DISTRICT	
NTS MAP SHEET: 93A/12	DATE: MARCH 27, 2009
Figure No. 15	





13.0 DRILLING

The 2007 drill program (2,008 m) tested geophysical and soil geochemical targets from the 2003 and 2005 reconnaissance surveys near the west boundary of the property. Holes K07-1 to 4 targeted chargeability anomalies at 900N and 1700N on Lines 100E and 200E. Hole K07-5 targeted an IP anomaly from Barker's 2003 IP survey which appears to be along strike with Cross Lake Minerals' anomalous Au-Cu-As-Sb geochemical trend as well as the ground that hosts the historical gold-mineralized interval (5.26 g/t Au over 8.5 m) intersected by Corona in 1989 in drill hole C89-6. Holes K07-6 and 7 targeted soil anomalies at a sedimentary-intrusive contact and Holes K07-8 and 9 targeted intrusive contacts in an area of a magnetic anomaly.

The purpose of this drill program was to determine whether elevated gold and pathfinder values in core could be related to chargeability or magnetic anomalies, sulphides, or alteration mineralization and what the preferable host rock types are. Knowledge gained in this early drill program, combined with subsequent geological mapping, geophysical and geochemical surveys help to create a model and define drill targets.

Rocks encountered in core were siltstones and basalt flows, both rock types often calcareous. These rocks were intruded by an apparently multimodal gabbro-diorite-monzodiorite intrusive containing monzonite xenoliths. The intruded rocks were locally brecciated and hornfelsed.

In Hole K07-1, Sample No. 187450 had 15,700 ppb Au over 1.51 m in a basalt, locally brecciated, with chalcopyrite, pyrite and veining. This sample was analysed twice for Au. ActLabs' analysis method 1C returned the high Au result and a reanalysis using method 1H had no Au. This discrepancy is attributed to a possible 'nugget effect' where a relatively coarse particle of gold was analysed in the first analysis but was not present in the second. Chalcopyrite was commonly observed over approximately a 150 m interval.

In Holes K07-2 and 5, gold was spottily anomalous, with values in several hundred ppb. Nearby occurrences of chalcopyrite, quartz-carbonate veins and structural traps such as breccia or faults were associated with higher Au values. Carbonate veinlets were more common than quartz and carbonate alteration was common and widespread. Higher Au values occurred where alteration included silicification, chlorite, sericite, carbonate and epidote but a quantitative relationship could not be established without further drill testing.

Two approximately 1 metre sections in the lower part of Hole K07-2 were 70% pyrrhotite in hornfelsed rock; these did not have significant Au associated, indicating hornfels with heavy pyrrhotite is not an obvious best host. Chalcopyrite was commonly observed over approximately 230 m.

Sample Nos. 85026 and 85029 in Hole K07-5 had 1,410 ppb Au over 1.22m and 3,320 ppb 1.50 m respectively. Chalcopyrite was frequently observed in Hole 5 over approximately 250 m, almost the entire hole, similar to Hole K07-2. Higher Au values tended to be associated with higher Cu, Zn and As and less well with other pathfinder elements.

In Holes K07-3, 4 and 6 to 9 Au was infrequently spottily anomalous. Holes 3 and 4 tested a chargeability anomaly in sedimentary rock on the north side of a diorite body, apparently a local sill, perhaps an offshoot of the main intrusive body farther south. The latter 4 holes were set up at 2 locations testing orientations of geologic contacts along with their possible association with local soil anomalies and magnetism from the 2003 surveys. Spotty chalcopyrite occurred in the middle and lower portions of Holes 3 and 4. Very minor chalcopyrite occurred in Holes 6, 7 and 8.

The results of this early drill program suggest the best mineralization, including gold, probably occurs at structural discontinuities such as lithologic contacts and fault zones containing veins, within an alteration zone related to the intrusive stock. The alteration 'fronts' at Kangaroo, as suggested by the geophysical surveys done late in 2007 were not tested in this drill program. Considering the QR model, the Au deposits tend to occur toward the leading edge of the alteration aureole around the QR intrusive. The 2007 drill set ups at Kangaroo may have been too 'inboard' of the alteration fronts, too close to the intrusive.

Table No. 2 Kangaroo Property Diamond Drill Hole Details

Hole ID	Grid Location	UTM East	UTM North	Az (°)	Dip (°)	Length (m)	Target
K07-1	200E/800N	589003	5837871	0	-50	249.39	Chargeability anomaly from 2003 IP survey.
K07-2	100E/850N	588904	5837923	0	-50	244.61	Chargeability anomaly from 2003 IP survey.
K07-3	100E/1650N	588842	5838668	0	-50	243.08	Chargeability anomaly from 2003 IP survey.
K07-4	200E/1600N	588993	5838690	0	-50	236.37	Chargeability anomaly from 2003 IP survey.
K07-5	200E/300N	588993	5837402	0	-50	261.69	Chargeability anomaly from 2003 IP survey with Au soil anomaly nearby.
K07-6	1100E/125N	589878	5837737	0	-50	209.84	Multi-element soil anomaly associated with intrusive contact. Hole oriented perpendicular to contact.
K07-7	1100E/125N	589878	5837737	300	-50	212.89	Multi-element soil anomaly associated with intrusive contact. Hole oriented perpendicular to sedimentary layering.
K07-8	'9+50' on road	589731	5837967	290	-50	195.51	Magnetic anomaly associated with intrusive contact. Hole oriented perpendicular to (sill?) contact.
K07-9	'9+50' on road	589731	5837967	335	-50	154.94	Magnetic anomaly associated with intrusive contact. Hole oriented perpendicular to basalt-diorite contact.

14.0 SAMPLING METHOD and APPROACH

The historical methods used may vary and are not always described in detail in the assessment reports. The assessment reports should be consulted for the sampling methodology in the relevant year's work.

Barker Minerals' approach and sampling method in its exploration work, described below, is common industry practice.

Rock and Core Samples

Outcrops and float containing sulphide mineralization were sampled by grab or chip sampling. Grab samples consisted of a single chunk of rock or several pieces from a single, discrete site. Where specified, chip samples were taken as a series of evenly-spaced small pieces collected over a specified sample length across a geological unit or structure of interest.

Drill core containing sulphide mineralization was sawn in half with a diamond saw. One half of each sample interval was sent out for geochemical analysis, while the other half was replaced in the core box and stored for future reference.

Soil and Stream Sediment Samples

Soil samples were collected with a grub hoe or specialized soil sampling auger from near the top of the "B" soil horizon. Stream-sediment samples were collected by digging silt from the active stream bed and screening out coarse material in the field.

Samples were collected and placed in standard paper envelopes manufactured for the purpose. The sample bags were labelled with a sample number or according to station and line if on a cut grid. On return to base camp in Likely the samples were air-dried in their bags prior to shipment to the lab. At the lab the samples were oven-dried, then sieved to -80 mesh and measured portions taken for geochemical analysis.

15.0 SAMPLE PREPARATION, ANALYSES and SECURITY

The historical methods used may vary and are not always described in detail in the available reports. The assessment reports should be consulted for the laboratory methodology in the relevant year's work.

Core samples in 2007 were cut and bagged at Likely under the supervision of R. Turna, P.Geol. The samples were stored in a locked garage until shipment. Barker Minerals staff collected the geochemical exploration rock, soil and stream sediment samples.

Barker Minerals Ltd. personnel shipped samples to the analytical laboratory. The drill core from the drill programs is stored at the company's field camp in Likely, BC.

All chemical analytical work was performed by certified chemists at an accredited laboratory, ActLabs Laboratories Ltd. of Ancaster, Ontario. ActLabs code 1C (exploration) and 1H ('Au+48') analytical methods were used to analyse drill core. Method 1H was used to analyse soils and rock samples. Method 1C analyzed for Au, Pt and Pd and used fire assay-ICP/MS. Method 1H analyzed for Au and 48 pathfinder elements and used variously, INNA (neutron activation) or ICP (inductively coupled plasma). A third method, ICP/MS (Inductively Coupled Plasma Mass Spectrometry), using aqua regia digestive, was used to analyse soil samples in the 2005 survey for 59 elements including Au.

The following description of ActLabs' methods, *in italics*, is from their website.

ActLabs Method 1C (Exploration)

A 30 g sample is weighed, mixed with fire assay fluxes and fused at 1050°C for 1 hour. After cooling the lead button is separated from the slag and cupelled at 1000°C to recover the Ag (dore bead) + Au, Pt, Pd. The Ag dore bead is digested in hot (95°C) HNO₃ + HCl. After cooling for 2 hours the sample solution is analyzed for Au, Pt, Pd by ICP-OES. Smaller sample splits are used for high chromite or sulphide samples to ensure proper fluxing and metal recoveries. If values exceed upper limits, reanalyses by fire assay Au, Pt, Pd (Code 8) is recommended.

ActLabs Method 1H (Au+48)

INNA Portion:

An approximately 30 g aliquot, if available, is encapsulated and weighed in a polyethylene vial and irradiated with flux wires and an internal standard (1 for 11 samples) at a thermal neutron flux of $7 \times 10^{12} \text{ n cm}^{-2} \text{ s}^{-1}$. After a seven day decay to allow Na-24 to decay the samples are counted on a high purity Ge detector with a resolution of better than 1.7 KeV for the 1332 KeV Co-60. Using the flux wires the decay corrected activities are compared to a calibration developed from multiple certified international reference materials. The standard present is only a check on accuracy of the analyses and is not used for calibration purposes. From 10-30% of the samples are rechecked by re-measurement.

Total Digestion – ICP Portion:

A 0.25 g sample is digested at 260°C with four acids beginning with hydrofluoric, followed by a mixture of nitric and perchloric acids, heated using precise programmer controlled heating in several ramping and holding cycles which takes the sample to dryness. After dryness is attained, samples are brought back into solution using aqua regia. With this digestion certain phases may be only partially solubilized. This leach is partial for magnetite, chromite, barite, spinels, zircon and massive sulphides. The solutions are analyzed using either a Varian VISTA PRO, Varian 735-ES Perkin Elmer OPTIMA 3000 Radial ICP.

Inductively Coupled Plasma Mass Spectrometry (ICP/MS)

ICP-MS is a versatile, rapid and precise analytical technique which provides high quality multi-element and isotopic analyses for samples in solution. It is capable of determining the

concentrations of 70+ elements in a single analytical run. The detection limit for most elements in solution is in the sub-ppb range. For some elements it may lie in the sub-ppt range. The ICP-MS instrument employs an argon plasma as the ionization source and a quadrupole mass spectrometer to detect the ions produced. During analysis, the sample solution is nebulized into flowing argon gas and passed into an inductively coupled plasma. The gas and nearly everything in it is atomized and ionized, forming a plasma. The plasma is a source of both excited and ionized atoms. The positive ions in the plasma are then focused down a quadrupole mass spectrometer where they are separated according to mass, detected, multiplied and counted.

The versatility of the ICP-MS technique makes it a multi-disciplinary analytical tool. It is widely used in many industries including geological, environmental, biological, agriculture, clinical, chemical, semiconductor, nuclear and research laboratories, as a key analytical tool for the determination of trace level elements. This technique is most suitable for water and selective leach solutions where best detection limits are required.

This author considers that the sampling methods by Barker Minerals have been in accordance with normal practice in the mineral exploration industry and have been done in an ethical manner. Secure locked storage of samples before shipment is in the garage and main building at Barker Minerals' field office at which field programs are based.

16.0 DATA VERIFICATION

This author has traversed the Kangaroo Property extensively and verified the locations of the important samples and work locations on the property and personally supervised the 2007 field program.

The analytical laboratories used standard reference materials and calibration solutions and repeat measurements on solutions in order to insure quality control and data verification in regard to chemical analyses. ActLabs routinely analyses duplicate samples and standards and reports these analyses on the data certificates. Barker Minerals has preserved the analysis certificates as issued by the accredited analytical laboratories per each sample and test.

Check samples from WCM Minerals of Burnaby, BC with certified known metals content were sent at intervals to ActLabs for analysis. ActLabs' values are compared to the certified values. The reliability of the ActLabs' values were considered acceptable.

The geophysical surveys were conducted to industry standards by contracted professional geophysicists, including concurrent in-field checks on the validity of the data.

17.0 ADJACENT PROPERTIES

17.1 QR Gold Mine

The following information on QR Mine is mainly from Gillstrom (2003) and Simpson (2005). Some additional information is added from Minfile 093A 121 and Mineral Deposit Type K04 (Au skarns) of the BC Geological Survey.

The QR gold mine is located 8.0 km WSW of the Barker Minerals' Kangaroo Property. The deposit was first staked in 1975 by Dome Exploration and Newconex Exploration during a regional reconnaissance program. The property has been continuously drilled by various owners since 1981. In 1992 the property was acquired by CMP Resources. The following year Kinross Gold Corp. was formed from CMP and two other companies. In 1995 mining of the Main Zone started; a 5 year mine life was projected. In 1998 mining was suspended due to low gold prices. Kinross reported processing 1.06 million tonnes averaging 4.1 g/t gold, with 118,004 ounces of gold produced. In 2004 Cross Lake Minerals Ltd. acquired 100% interest in the property. In 2005 NI43-101 compliant updated resource estimates for three of the five known zones of the QR deposit were summarized (below):

Table No. 3 QR Deposit Resource Summary

Zone	<u>Measured Resources</u>			
	Cutoff			
	g/t Au	Tonnes	Au g/t	oz Au
Midwest	3.0	11,465	5.67	2,089

Zone	<u>Indicated Resources</u>			
	Cutoff			
	g/t Au	Tonnes	Au g/t	oz Au
Northwest	1.6	122,417	3.58	14,078
West	1.6	355,907	5.07	58,037
Midwest	3.0	180,712	5.54	32,164

Zone	<u>Combined Measured and Indicated Resources</u>			
	Cutoff			
	g/t Au	Tonnes	Au g/t	oz Au
Northwest	1.6	122,417	3.58	14,078
West	1.6	355,907	5.07	58,037
Midwest	3.0	192,176	5.54	34,255

The North Zone was considered to have potential to host significant tonnage and further drilling was recommended.

Cross Lake started up full operations and poured their first gold on November 24, 2007. The QR mill is rated to operate at 900 tonnes per day. In June, 2007 BC Hydro began construction of a now-complete, \$2.1 million power line to the mine which considerably reduced operating costs compared to the Kinross days. (The Northern Miner, Vol. 93, No. 45, Dec 31, 2007 – Jan 6, 2008).

In 2008 Cross Lake Minerals made the decision to temporarily shut the operation in January, 2009 to allow management of Cross Lake Minerals to review the economics and reserves of the operation.

Regional Geology

The QR property lies within the Quesnel Trough, a northwesterly trending island arc assemblage comprised of volcanic and marine sedimentary units of late Triassic to early Jurassic age, including the Takla Group in the QR area. The Takla Group is cut by late Triassic to Early Jurassic intrusions at regularly spaced intervals forming a linear belt within the Quesnel Trough. A number of these intrusions are zoned, including the QR stock, and are known to host alkaline suite Cu and Cu-Au deposits including the Mt. Polley Mine 15 km to the southeast.

Local and Property Geology

The QR property is underlain by a south-dipping sequence of alkali basalts, calcareous tuffite and calcareous mudstone of the Takla Group. The alkali basalt unit is comprised of massive flows, monolithic breccia and minor wacke, sanstone and pillow breccia and flows.

The basalt unit grades upward into a basaltic tuff and pyritic tuffite. This unit locally forms a massive carbonate rock in the Main Zone footwall. Pyrite forms up to 10% of the matrix and 5-20% of the total unit. Where altered and skarned, the tuffite unit is the primary host to all the Au deposits on the property with the exception of the Northwest Zone.

The tuffite is overlain by a sequence of calcareous mudstone, black argillite and tuff. Near the QR deposit this unit is predominantly volcanoclastic with hornfels developed near the intrusion. This unit contains up to 10% disseminated pyrite.

The Takla Group sequence is intruded by the QR stock. It is mainly monzonitic in composition with a dioritic margin. The stock measures 1 km N-S and 1.5 km E-W.

Deposit Type

The QR deposit is considered a porphyry-related propylite gold skarn, with the majority of the gold associated with sulphide mineralization in an epidote rich propylitic alteration halo around the QR stock.

Mineralization

Mineralization has a strong spatial relationship to both the siltstone-volcanic contact and the alteration front. The ore grade mineralization generally occurs within 50 m of the epidote alteration front and 150 to 300 m from the contact with the intrusive rocks.

Sulphide mineralization varies from 1% to 15% and consists of pyrite and pyrrhotite with minor amounts of chalcopyrite, galena and sphalerite. The gold mineralization and propylitic alteration generally occur in and along the contact between the lower calcareous basalt and upper mudstones and argillites except at the Northwest Zone where the mineralization occurs within the siltstone/argillite unit and between several prominent dikes. Faulting has displaced the mineralization into five known zones.

The Main Zone is pod-shaped, 280 m long and extends 100 m below the surface where it is truncated by a fault. The mineralization in this zone is a green to grey propylitically altered carbonate and pyrite rich rocks, with minor pyrrhotite and rare chalcopyrite.

The Midwest Zone strikes at 110° and dips steeply south. Propylitic mineralization follows the basalt/siltstone contact. Most of the surface mining by Kinross came from the Main and Midwest Zones.

The Northwest Zone occurs within the siltstones and argillites. This flat lying zone strikes 110° and is approximately 350 m long, 50 to 75 m wide and is from 10 to 15 m thick.

The West Zone follows the basalt/siltstone contact for 450 m. It is approximately 60 m wide and 5 to 15 m thick. The mineralization consists of green to black/green propylite, with 5-15% pyrite. As in the other zones, the amount of pyrite is a general indication of gold grade. Coarse gold, up to 1 mm in diameter, has been observed in drill core from the West Zone.

The North Zone is an extensive area of propylitically altered basalt lying below the Main Zone. The North Zone is the largest zone of Au mineralization on the property with a drill indicated strike length of at least 1 km. The North Zone and the small East Zone have grade comparable to the other Zones but the mineralization is too deep to be of economic interest at present.

The Main, North, Midwest and Northwest deposit zones occur on the north side of the QR stock; the West zone is on the west side of the stock.

17.2 Cariboo Property

The exploration of Cross Lake Minerals' Cariboo property is documented in the publicly available BCGS Assessment Reports (Nos. 10650, 11556, 12512, 13881, 16018, 19324, 19597, 26933, 27418) and the Technical Report by Church, (2003).

Cross Lake Minerals' Cariboo property (149 cells or units, 3,179 hectares) is located approximately 2 km east of their QR gold mine and is adjacent to the west side of Barker Minerals' Kangaroo Property. The Cariboo property was staked in 1981 to cover an As anomaly on a west flowing tributary of Maude Creek. From 1982 to 2003 Geological mapping, soil and geophysical surveys, trenching and drilling have been done on the property.

In 1985 and '86 IP geophysical surveys located several chargeability anomalies, including a large area of high chargeability on the East Grid. Soils on the East Grid had several E-W trending gold anomalies with values up to 525 ppb. Soil sampling in 1989 extended eastward a gold anomaly that was targeted by drill hole C-89-6 that year.

Ten drill holes (1,751 m) were done in 1989 and 7 holes (1,421 m) in 2003. In the 1989 drilling, hole C-89-6 had 5.26 g/t Au over 8.5 m, among several anomalous gold intervals, in a wide zone of silica alteration. This hole is located approximately 400 m west of Barker Minerals' claim boundary.

In the 2003 drilling, anomalous Au occurred in 2 holes:

C-03-12: 3.17 g/t over 2.12 m

C-03-13: 2.03 g/t over 2.69 m

C-03-13: 1.71 g/t over 2.83 m

anomalous Cu and Mo in 3 holes:

C-03-15: 0.06% Cu and 0.02% Mo over 58.86 m.

C-03-16: 0.05% Cu and 0.02% Mo over 20.46 m.

C-03-17: 0.067% Cu and 0.03% Mo over 27.2 m.

Trenching in 2002 exposed volcanic tuff with the best Au intersection having 2.24 g/t over 3.0 m.

Au mineralization occurred in silicified and carbonatized shear zones in a tuff unit. Elevated Au values appeared directly related to the presence of arsenopyrite, mineralization observed in core.

Two main northwest-southeast trending [soil] geochemical anomalies were identified. The southern anomaly contains elevated values of Au, Cu, Sb, and As and covers the area drilled by DDH C-89-6 that contained elevated Au values. The narrower northern anomaly has a signature of elevated Au, Cu, and Mo values and overlies a strong IP chargeability high and magnetic high. The geochemical anomalies are generally most intense in the eastern part of the survey area and decrease to the west possibly reflecting the effects of glacial transport and dispersion. This zone of broadly coincident geochemical and geophysical anomalies trends all the way to the eastern boundary of the surveys which roughly coincides with the Cross Lake-Barker Minerals claim boundary. (McKinley, 2004, pg. 45-46).

(Figure Nos. 18-21 below show DDH C-89-6 location relative to geochemical and geophysical anomalies on Cross Lake's Cariboo property which may trend onto Barker Minerals' Kangaroo property.)

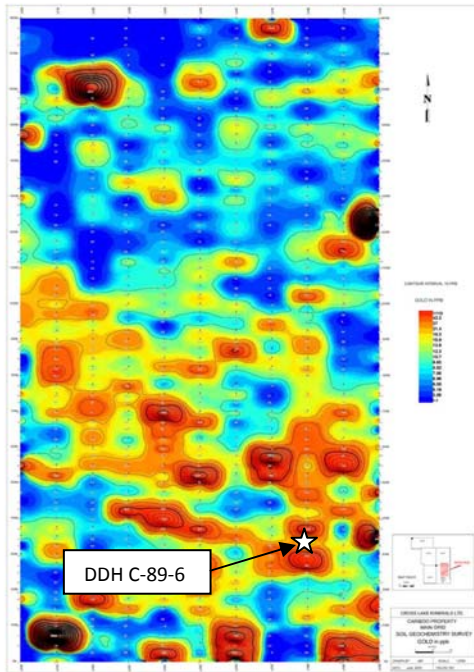


Figure No.18 Cariboo Property – Au in Soils (after Curch, 2003)

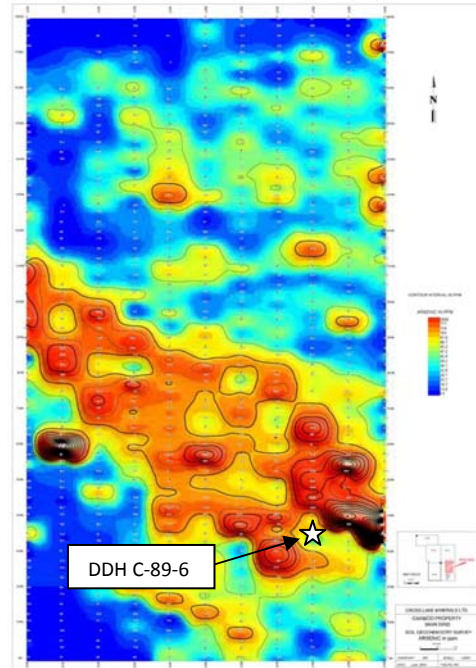


Figure No.19 Cariboo Property – As in Soils (after Curch, 2003)

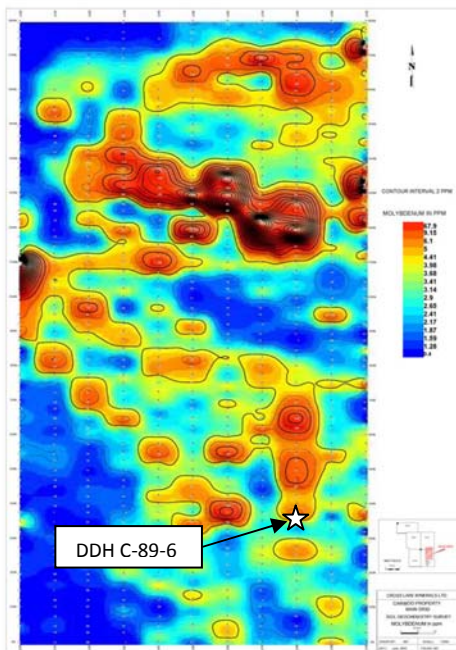


Figure No.20 Cariboo Property – Mo in Soils (after Curch, 2003)

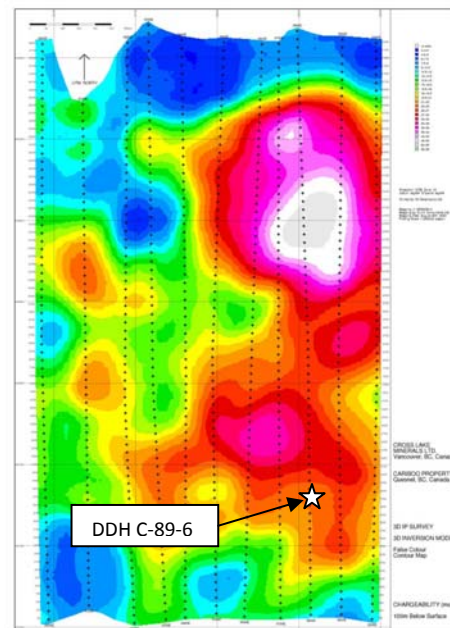


Figure No.21 Cariboo Property – Chargeability (after Curch, 2003)

17.3 Barker Minerals' Quesnel Platinum Project

Barker Minerals' Ltd. mineral prospects are located on a contiguous group of claims approximately 80 km x 30 km in size termed the 'Peripheral' claim block. The 'Peripheral' block includes most of Barker Minerals' separate prospects which, by 2009 have the names Frank Creek, Ace, Simlock, Big Gulp, SCR, Sellers Creek, Trump, Cariboo (Maybe), Unlikely, Peacock (Rollie Creek), Black Bear (Providence Mine), Tasse, Upper Grain, Kangaroo, Maud, MAG and Gerimi. These individual prospects have loosely defined boundaries within the 'Peripheral' block. Barker's Maud and MAG properties, comprising their Quesnel Platinum Project are described below as prospects possibly similar to Cross Lake Minerals' QR deposit and Barker's Kangaroo property. Maud appears to have a direct connection to QR via a major magnetic structure. Anomalous Pt in ultramafic rocks in core at Maud (Fox, 1988) and the widespread occurrence of Pt in placers in Quesnel River (Rublee, 1986) suggest a spatial overlap of QR & Kangaroo-type mineralization and ultramafic-related (Alaskan-type) PGE's. When exploring for a certain mineral deposit type the possibility of different kinds of deposits in the same area should not be ignored.

MAUD Property

Geophysical and Geochemical Work Done in 1981.

The relevant reports are Assessment Reports 9449 and 9956 by R.F. Sheldrake.

Assessment Report 9449 describes three airborne magnetic and EM surveys by Dome Exploration (Canada) Ltd. at Quesnel River, Maud Lake and Cantin Creek. A strong geophysical conductor anomaly at Maud Lake was considered most worthy of follow-up, however this conductor anomaly was under the lake near the west shore. The assessment report's Total Field Magnetic Map (see Figure No. 22, this report) shows a discontinuous NW-SE trending linear magnetic high anomaly flanked on both side by continuous magnetic low anomalies. The northeast side mag-low is apparently coincident with the conductor anomaly and a topographic low occupied by Maud Lake. This linear topographic and magnetic low may be related a fault. The magnetic high and flanking mag-lows can be followed from the west side of Maud Lake 10.0 km southeast to the centre of the Quesnel River survey area where the site of the future QR gold mine is associated with a strong magnetic high. A weak conductive response there was within background noise levels. The apparent direct connection between the magnetic structures at QR and Maud Lake was not discussed in the assessment report but is evident on the Total Field Magnetic Map. A recommendation was made for a ground HLEM survey at Maud Lake to determine drill targets.

The assessment report's Interpretation Map considered the NW-SE trending magnetic anomaly to be a fault, with the mag-high likely being related to intrusive rocks. Subsequent drilling at QR and Maud Lake demonstrated this to be true. The NW-trending faults adjacent to the ore zones at QR (Walley's Fault, West Zone Fault) are considered post-ore (Fox, P.E. & Cameron, R.S., 1995), but the apparently continuous linear structure comprising mag-lows with a strong magnetic high sandwiched between, connecting QR and Maud Lake doesn't seem to have been

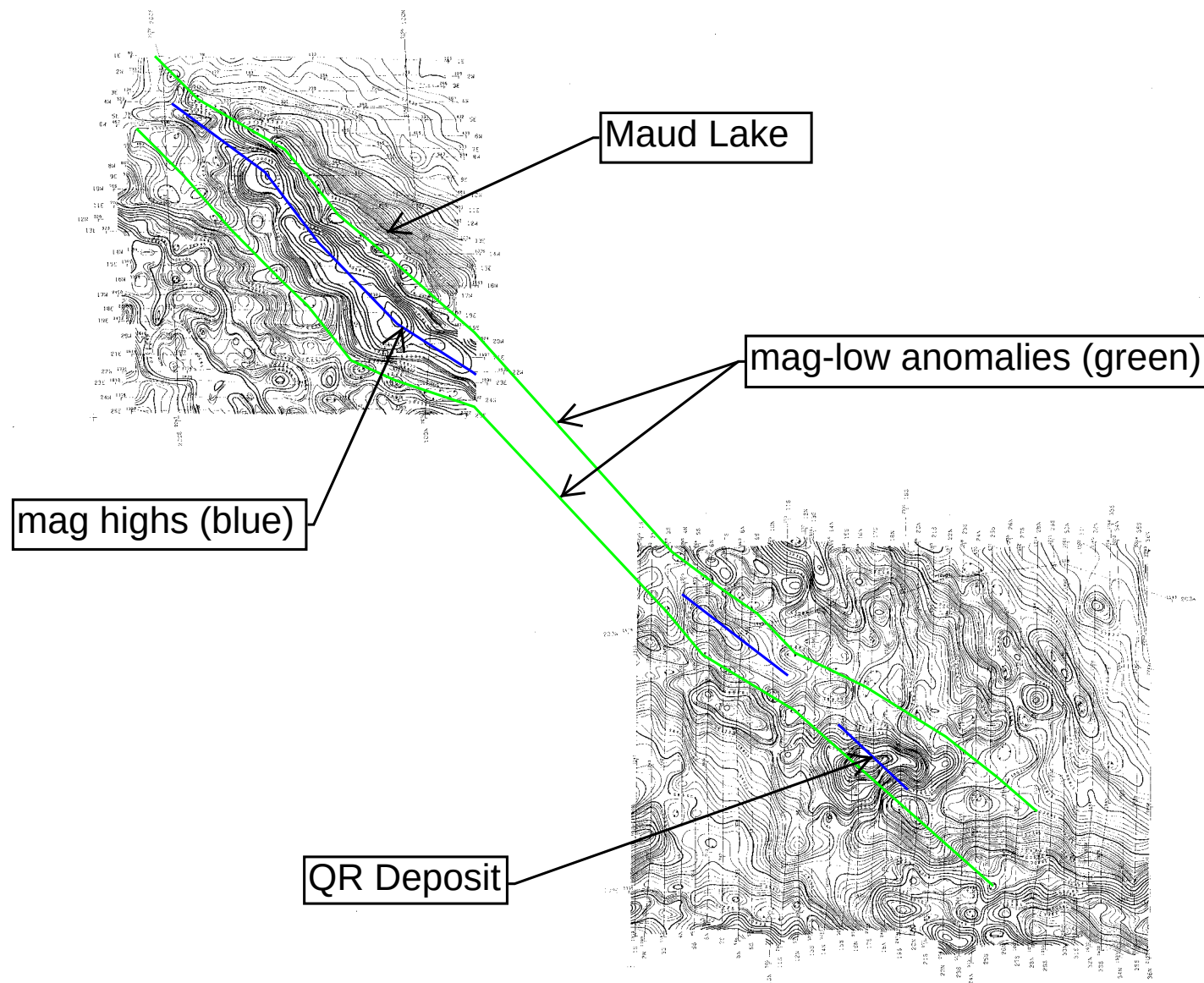


Figure No. 22

NOTES:

- VERTICAL CONTROL - BASSON ALTIMETER
(MEAN DENSON 10 04 55 METRES)
- HORIZONTAL CONTROL - 30 M M FLM,
INDEPENDENT OF PHOTO GEOMETRICS
- REGIONAL TOTAL FIELD VALUE
58,000 GAMMAS
- MAGNETIC DECLINATION 33P E
- MAGNETIC INCLINATION 72°
- CONTOURS UNCONNECTED FOR
REGIONAL GRADIENT
- MAGNETOMETER - GEOMETRICS G-605

LEGEND

- 100 GAMMA CONTOUR
- 25 GAMMA CONTOUR
- MAGNETIC DISPRESSION



9449

PLATE II
TOTAL FIELD MAGNETIC MAP
QUESNEL RIVER & MAUD LAKE AREA
CARIBOO MINING DIVISION
BRITISH COLUMBIA
DOMEX EXPLORATION (CANADA) LTD.

Scale 1:25,000
N.T.S. 93A/12 HYDRAULIC

To accompany a report by Harold F. Stephens dated May 25, 1981

recognized. The correlation of the QR and Maud Lake magnetic anomalies emphasizes the importance of this trend, which may be pre-mineralization and determine the location of other QR-type deposits.

Assessment Report 9956 describes ground geophysical and soil sampling work done in 1981 by Dome Exploration (Canada) Ltd. on their Maud property. This report contains the same account of the airborne geophysical survey described in Ass Rpt 9449, with some maps from the prior report excluded and others added. A recommendation for drilling was made, targeting combinations of geophysical, geochemical and geological data. Parts 2 and 3 of Assessment Report 9956 describe IP geophysical ground magnetometer and soil sampling surveys done on the property later in the year. The IP survey outlined an extensive strong, complex but well defined zone of increased chargeability on the west side of Maud Lake. The magnetometer work helped define lithologic boundaries. 1,255 soil samples were collected and analysed for Au, Ag, As, Cu. No anomaly pattern was apparent.

Drilling Done in 1981.

The relevant report is Assessment Report 10527 by P.E. Fox.

Dome Exploration (Canada) Ltd. drilled four DDH holes (1,415 m) were drilled late in the year on the Maud property. The drill targets were mostly IP anomalies, sometimes associated with altered rocks in outcrop. The drill core had scattered weak anomalous Au. There was no discussion of the results or recommendation made.

Drilling Done in 1987.

The relevant report is Assessment Report 17598 by P.E. Fox.

Work was done in 1987 on Maud property by QPX Minerals Inc. Twelve holes (2,878 m) targeted geophysical anomalies along a favourable geologic contact. The favourable horizon was a zone of propylitized calcareous basalt in contact with overlying felsic volcanics and sedimentary rocks near an intrusive stock. The model was the QR deposit 10 km to the southeast. The work was done in the same area on the west side of Maud Lake as the 4 holes done in 1981. Anomalous Au values up to 1,260 ppb were associated mainly with chloritized shear zones. Holes 9 and 10 were in an ultramafic (gabbro-pyroxenite) stock for their entire length (approximately 230 m each). These holes had scattered gold anomalies including in a 10cm section of massive pyrite and chalcopyrite 2.0 m from the bottom of Hole 9. Selected samples of the ultramafic had anomalous (up to 35 ppb) platinum.

The ultramafic body was associated with a high resistivity anomaly within the larger mag-high anomaly. Several other, similar resistivity highs within the mag-high were not tested by drilling. The report drew no conclusions or made any recommendations but 3 years assessment was applied to the property.

MAG Property

Ground magnetic survey and soil sampling done in 1968.

The relevant report is Assessment Report 1824 by R.D.H. Philp.

Work was done in 1968 on the Mag property by Agilis Exploration Services Ltd. Despite extensive overburden and little outcrop it was determined that the entire property was underlain by dioritic intrusives with sedimentary and volcanic rocks underlying north and east of the property. Government aeromagnetic data indicated the centre of the property to be underlain by an intense northwesterly trending magnetic high. Approximately 90 soil samples were collected over an approximately 500m x 500m area; a magnetic survey was done over the same area. The government magnetic anomaly was confirmed but the limited soil survey had no anomalous values.

Soil sampling done in 1987.

The relevant report is Assessment Report 17484 by B.H. Kalhert.

Work was done in 1987 on the Gravelle property by Circle Resources Ltd. The property covered portions of 3 streams where previous reconnaissance stream samples had anomalous Au. The follow-up work consisted of 340 soil, 3 heavy mineral stream silt and 4 rock samples over a 1.5 km x 2.0 km grid. The 3 heavy mineral samples were strongly anomalous in Au. Lack of outcrop prevented a detailed geological evaluation but the property was determined to be underlain by monzonite, granodiorite and granite. Chloritic schists occurred west of the property. The government northwesterly trending aeromagnetic anomaly was considered to be consistent with a northwest trending intrusive. This anomaly trends across the upper end of the middle of the 3 anomalous streams and coincides with the magnetic anomaly in Barker Minerals' 2007 survey on their MAG property (Turna R., & Doyle L.E., 2008).

The smaller, northern stream was entirely within the Gravelle property and was entirely covered by the soil sampling grid. The heavy mineral sample from the stream had values of 4,600 ppb and 2,150 ppb Au in the 80 mesh and 40 mesh sizes respectively, but the soils collected in this stream's drainage area had no Au anomalies. The middle, longer stream toward the south, had only its lower half covered by the property and soil survey grid. The heavy mineral sample on this stream had values of 42 ppb and 875 ppb Au in the 80 mesh and 40 mesh sizes. The soil survey on the lower half of this stream's drainage area also had no Au anomalies. A third stream, farther south, just out of the property had values of 1,650 ppb and 183 ppb Au in the 80 mesh and 40 mesh sizes. The soil survey did not really test this drainage area. Isolated anomalous Au up to 235 ppb occurred in soil samples on the north side of the survey grid. Follow-up work was recommended to include more detailed soil sampling and prospecting, to be followed by an IP survey and drilling.

Barker Minerals Ltd. Quesnel Platinum Project, 2000 - 2007

The relevant reports are Assessment Reports 26504 by J.G. Payne, 27125 by L.E. Doyle, 29740 by R. Turna and L.E. Doyle and an Assessment Report (un-numbered at this writing) by R. Turna (2009).

Work done on the in 2000 by Barker Minerals Ltd. on their Quesnel Platinum Project included several reconnaissance ground magnetometer and VLF-EM surveys along roads in the areas of the former Maud, Mag and Gravelle properties described above. Several magnetic and VLF-EM anomalies confirmed the results of the airborne survey of Dome Exploration in 1981. Prospecting by Barker Minerals tended to confirm the presence of mafic to ultramafic rock types. In 2007 Barker Minerals conducted limited magnetic VLF-EM and IP surveys over 8 km of grid lines on their MAG property. A strong magnetic anomaly over the grid was suggested to be associated with an intrusive body. A high chargeability zone adjacent to the magnetics, was considered to be associated with sulphides in adjacent intruded rocks. In 2008 Barker did prospecting and cursory mapping on their Gerimi property, approximately 5 km northwest of the their MAG property. The work here was concentrated at the historic Lynda showing (Minfile 093B 025) and tended to confirm the Cu mineralization there to be limestone-related. At this time it is not expected the type of mineralization here to be similar to that at MAG or Maud Lake areas.

The occurrence of platinum in placers in the Quesnel River area has been described by Rublee (1986). The historic Bullion Pit, 4 km west of the town of Likely, produced 175,000 ounces of gold and 1,800 ounces of platinum. Rublee reported that at Twenty Mile Creek platinum, palladium and osmiridium occur as metallic grains and in small nuggets of magnetite and chromite. Analysis of concentrates taken from sluices returned 2,194.3 g/t Pt, 2,208.0 g/t Pd and 1,440.0 g/t Os. This creek is indicated on Rublee's map (Open File Map 1986-7) as approximately 10 km west of the Bullion Pit on NTS map sheet 93A/12. Twenty Mile Creek is an obsolete name in this area and does not appear on this map sheet nor in GeoBC - The Crown Registry and Geographic Base Branch of the Government of British Columbia. GSC Map 278 (Bowman, 1889) shows Twenty Mile Creek to be that which is named on modern maps as Birrell Creek, flowing south from Twenty Mile Pass, 4.5 km west of Maud Lake. Placer mineral claims on Maud Creek, flowing southeast out of Maud Lake, have Au and Ag values. An unspecified assay contained 0.1714 g/t Pt (Minfile 093A 085).

The presence of several pyroxenite, hornblendite and gabbro intrusions in the Cantin Creek area (Logan and Moynihan, 2009), 4 km north of Barker Minerals' Gerimi property, indicates the possibility of ultramafic intrusions favourable for the occurrence of platinum group elements (PGE's) along the northwest trend from Maud Lake to Gerimi Creek.

The occurrence of PGE's at Birrell (Twenty Mile) Creek, Maud Creek and Bullion Pit near Likely suggest the favourable trend may extend at least this far southeast.

18.0 MINERAL PROCESSING and METALLURGICAL TESTING

This section is not applicable.

19.0 MINERAL RESOURCES and MINERAL RESERVE ESTIMATES

This section is not applicable.

20.0 OTHER RELEVANT DATA and INFORMATION

This section is not applicable.

21.0 INTERPRETATION and CONCLUSIONS

The geology of the Kangaroo Property consists of sedimentary and volcanic rocks of the Upper Triassic to Lower Jurassic Nicola Group and associated intrusions, similar to lithologies at Cross Lake Minerals' QR mine, considered an Au skarn deposit. The QR gold mine, located 8.0 km WSW of the Barker Minerals' Kangaroo Property, is considered the possible model for mineralization explored for on the Kangaroo Property.

At the Kangaroo Property siltstones and lesser calcareous basalt flows are intruded by an apparently multimodal gabbro-diorite-monzodiorite stock containing monzonite xenoliths. The intruded rocks are locally brecciated and hornfelsed. The stock at Kangaroo is approximately 1.0 km x 1.8 km on the ground surface, similar in size to the QR stock.

An Au soil anomaly occurs over an area approximately 1 km x 2 km in size and remains open to the east and south. The Au anomaly occurs together with Cu, As, Mo and other pathfinder elements over the central stock and over the intruded sedimentary and volcanic rocks.

In the 2007 drilling program, spotty high Au values (up to 15,700 ppb Au over 1.51 m in hole K07-1) occurred in several holes, often associated with chalcopyrite. At the time of the drilling, the zone on the north side of the intrusive was not recognized as the most altered and prospective; this zone is considered to be as yet untested by drilling.

Results of the geophysical survey suggest the north side of the intrusive is more strongly mineralized than the south side. The intruded rocks are strongly mineralized with sulphides as evidenced by outcrops, chargeability and low-resistivity anomalies extending approximately 500m and 1,000 m respectively, north from the intrusive contact. Locally massive pyrrhotite occurs in hornfelsed rocks close to the intrusive. At the QR mine, gold ore occurs within 50m of the alteration front around the QR stock. The chargeability and low resistivity 'fronts' at Kangaroo may coincide with alteration fronts that should be drill-tested for gold mineralization.

The magnetic anomalies at MAG and Maud properites of Barker's Quesnel Platinum Project should be tested by drilling. The mag-high anomalies are likely related to mafic to ultramafic intrusive bodies. Dependent on the chemistry of the intrusive body, QR-like skarn gold or Alaskan-type PGE mineralization is possible.

22.0 RECOMMENDATIONS

Kangaroo Property

The extensive alteration zone, characterized by soils anomalous in Au and pathfinder elements and zones of chargeability and low resistivity, over and adjacent to the intrusive stock should be comprehensively tested. The existing soil and IP geophysical surveys should be extended. Magnetometer and VLF-EM surveys should be done on the grid. Trenching, drilling and additional mapping should be done.

Diamond drilling should be done concentrating on the north side of the intrusive body. The purpose would be to discover a QR-like skarn gold ore body and to test the possibility for porphyry mineralization. The main targets would be the high chargeability and low resistivity 'fronts' but other geophysical locations and lithologic and shear structures should also be tested. Five fences of DDH holes, each fence with approximately four 300 m holes would be done.

Recommended budgets:

Kangaroo: Phase 1

Grid preparation and line cutting (20.0 line km)	\$	20,000
Road building/rehab (2,000 m)	\$	200,000
Trenching (2,000 m)	\$	200,000
Drilling @ \$150/metre (includes mob/demob, drilling)		
6,000 m	\$	900,000
Geophysics (20.0 km IP)	\$	100,000
(60.0 km mag/vlf)	\$	20,000
Geochemistry		
3,000 core/rock samples @ \$60/sample	\$	180,000
1,000 soil samples @ \$40/sample	\$	40,000
Consulting/core logging & cutting	\$	80,000
Camp manager/cook/expediter	\$	60,000
Vehicles/transportation/mobilization & demob	\$	50,000
Fuel	\$	100,000
Camp costs/supplies/maintenance/repairs	\$	50,000
Room & board/food	\$	100,000
Planning, supervision, report	\$	80,000
Contingency (approx. 10%)	\$	200,000
	\$	2,280,000

If warranted by results from Phase 1, the 2nd phase of work would include:

Kangaroo: Phase 2

Road building/rehab (2,000 m)	\$	200,000
Trenching (2,000 m)	\$	200,000
Drilling @ \$150/metre (includes mob/demob, drilling)		
10,000 m	\$	1,500,000
Geochemistry		
5,000 core/rock samples @ \$60/sample	\$	300,000
Consulting/core logging & cutting	\$	150,000
Camp manager/cook/expediter	\$	60,000
Vehicles/transportation/mobilization & demob	\$	50,000
Fuel	\$	100,000
Camp costs/supplies/maintenance/repairs	\$	50,000
Room & board/food	\$	100,000
Planning, supervision, report	\$	60,000
Contingency (approx. 10%)	\$	<u>280,000</u>
	\$	3,050,000

Quesnel Platinum Project – MAG property

The strong magnetic anomaly at MAG property (Turna R., & Doyle L.E., 2008) should be tested by a small trenching and drilling program to determine the type of intrusive rock the anomaly may be associated with. A grid should be cut over which soil sampling and magnetic, VLF-EM and IP geophysical surveys should be done. Results would determine the character of a possible 2nd phase of exploration.

MAG : Phase 1

Grid preparation and line cutting (20.0 line km)	\$	20,000
Trenching (500 m)	\$	50,000
Drilling @ \$150/metre (includes mob/demob, drilling)		
600 m	\$	90,000
Geochemistry- 400 soil samples @ \$40/sample	\$	16,000
Geophysics (20.0 km IP)	\$	100,000
(20.0 km mag/vlf)	\$	7,000
Consulting	\$	10,000
Camp manager/cook/expediter	\$	6,000
Vehicles/transportation/mobilization & demob	\$	5,000
Fuel	\$	10,000
Camp costs/supplies/maintenance/repairs	\$	5,000
Room & board/food	\$	10,000
Planning, supervision, report	\$	8,000
Contingency (approx. 10%)	\$	<u>33,000</u>
	\$	370,000

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Deposit Type I02 - Intrusion-Related au Pyrrhotite Veins

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Minfile No. 093A 119 (Maud) <http://minfile.gov.bc.ca/Summary.aspx?minfilno=093A%20%20119>

BC Ministry of Energy Mines and Petroleum Resources, Minfile Mineral Inventory:

Minfile No. 093A 121 (QR) <http://minfile.gov.bc.ca/Summary.aspx?minfilno=093A++121>

BC Ministry of Energy Mines and Petroleum Resources, Minfile Mineral Inventory:

Minfile No. 093B 025 (Lynda) <http://minfile.gov.bc.ca/Summary.aspx?minfilno=093B++025>

Geoscience BC Quest Project – Quesnellia Exploration Strategy

<http://www.geosciencebc.com/s/Quest.asp>

All Assessment Reports listed below are available for free download from the BC Geological Survey (BCGS) Assessment Report Indexing System (ARIS) at the Ministry of Energy, Mines and Petroleum Resources' website <http://www.em.gov.bc.ca/Mining/Geolsurv/Aris/default.htm>.

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24.0 DATES and SIGNATURES

Certificate of Author:

I, Rein Turna, P.Geol. do hereby certify that:

1. I am currently employed as Vice President of Exploration by Barker Minerals Ltd.

Barker Minerals Ltd.
8384 Toombs Drive
Prince George, B.C., Canada, V2K 5A3
Telephone: (250) 563-8752
Email: Barker@telus.net

I own and am President of my wholly owned consulting company:

Geocon Exploration Management Ltd.
5818 Falcon Road
West Vancouver, B.C., Canada, V7W 1S3
Telephone: (604) 921-8908
Email: geocon002@shaw.ca

2. I graduated with the degree Bachelor of Sciences in Geological Sciences from the University of British Columbia in 1975.
3. I am a registered member of the Association of Professional Engineers and Geoscientists of British Columbia.
4. I have worked as a geologist over 30 years since my graduation from university.
5. I have read the definition 'qualified person' set out in National Instrument 43-101 ('NI 43-101') and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a 'qualified person' for the purposes of NI 43-101.
6. I personally supervised the most recent work program on the Kangaroo property, completed in 2007. Though no significant work was done in 2008 my most recent visit to the property was on August 16, 2008 to check the condition of roads.
7. I am responsible for the preparation of all sections in the technical report titled Technical Report on the KANGAROO Property – Cariboo Lake Area – Cariboo Mining Division, British Columbia (the 'Kangaroo Report').
8. I am not aware of any material fact or material change with respect to the subject matter of the Technical Report that is not reflected in the Technical Report, the omission to disclose which makes the Technical Report misleading.

9. Greater than half of my gross income comes from employment with Barker Minerals Ltd.

I hold 370,000 common shares without par value in the capital of Barker Minerals Ltd.

I hold 220,000 warrants, each entitling me to purchase one common share of Barker Minerals Ltd. at a price of \$0.10 per share until December 31, 2010.

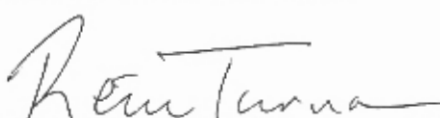
I hold 150,000 warrants, each entitling me to purchase one common share of Barker Minerals Ltd. at a price of \$0.05 per share until January 5, 2011.

I have a stock option plan with Barker Minerals Ltd. wherein I hold an option to purchase up to 150,000 common shares in the capital stock of Barker Minerals Ltd. at the purchase price of \$0.40 per share. The grant date of this option is April 20, 2007. The expiry date of this option is April 20, 2011.

10. I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.
11. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for the regulatory purposes, including electronic publication in the public company files on their website accessible by the public, of the Technical Report.

Dated this 8th Day of May, 2009

-- Signed and Stamped --


Signature: Rein Turna, BSc., PGeo.



Consent of Author:

Geocon Exploration Management Ltd.
5818 Falcon Road, West Vancouver, B.C., Canada, V7W 1S3
Telephone: (604) 921-8908
Email: geocon002@shaw.ca

Barker Minerals Ltd.
British Columbia Securities Commission
Alberta Securities Commission
Ontario Securities Commission
TSX Venture Exchange

I, Rein Turna, P.Geo., am the author of the Technical Report titled "Technical Report on the Kangaroo Property – Cariboo Lake Area – Cariboo Mining Division, British Columbia" dated May 8, 2009 (the "Kangaroo Report") and consent to the inclusion of any extracts from or a summary of the Kangaroo Report in the Annual Information Form of the Company (the "AIF") and to the filing of the Report with the securities regulatory authorities referred to above. I also consent to the reference to myself in the AIF.

I also certify that I have read the AIF being filed and have no reason to believe that there are any misrepresentations in the information contained in it that are derived from the Kangaroo Report or, within my knowledge as a result of the services provided by me in connection with the Kangaroo Report.

Dated this 8th Day of May 2009

-- Signed and Stamped --

Rein Turna



Signature: **Rein Turna, BSc., PGeo.**

Appendix A

B.C. Geological Survey Deposit Types

Au SKARNS

K04

by Gerald E. Ray
British Columbia Geological Survey

Revised 1997



Ray, G.E. (1998): Au Skarns, in Geological Fieldwork 1997, British Columbia Ministry of Employment and Investment, Paper 1998-1, pages 24H-1 to 24H-4.

IDENTIFICATION

SYNONYMS: Pyrometasomatic, tactite, or contact metasomatic Au deposits.

COMMODITIES (BYPRODUCTS): Au (Cu, Ag).

EXAMPLES (British Columbia - Canada/International): Nickel Plate ([092HSE038](#)), French ([092HSE059](#)), Canty ([092HSE064](#)), Good Hope ([092HSE060](#)), QR - Quesnel River ([093A 121](#)); Fortitude, McCoy and Tomboy-Minnie (Nevada, USA), Buckhorn Mountain (Washington, USA), Diamond Hill, New World district and Butte Highlands (Montana, USA), Nixon Fork (Alaska, USA), Thanksgiving (Philippines), Browns Creek and Junction Reefs-Sheahan-Grants (New South Wales, Australia), Mount Biggenden (Queensland, Australia), Savage Lode, Coogee (Western Australia, Australia), Nambija (Ecuador), Wabu (Irian Jaya, Indonesia).

GEOLOGICAL CHARACTERISTICS

CAPSULE DESCRIPTION: Gold-dominant mineralization genetically associated with a skarn gangue consisting of Ca - Fe - Mg silicates, such as clinopyroxene, garnet and epidote. Gold is often intimately associated with Bi or Au-tellurides, and commonly occurs as minute blebs (<40 microns) that lie within or on sulphide grains. The vast majority of Au skarns are hosted by calcareous rocks (calcic subtype). The much rarer magnesian subtype is hosted by dolomites or Mg-rich volcanics. On the basis of gangue mineralogy, the calcic Au skarns can be separated into either pyroxene-rich, garnet-rich or epidote-rich types; these contrasting mineral assemblages reflect differences in the host rock lithologies as well as the oxidation and sulphidation conditions in which the skarns developed.

TECTONIC SETTINGS: Most Au skarns form in orogenic belts at convergent plate margins. They tend to be associated with syn to late island arc intrusions emplaced into calcareous sequences in arc or back-arc environments.

DEPOSITIONAL ENVIRONMENT / GEOLOGICAL SETTING: Most deposits are related to plutonism associated with the development of oceanic island arcs or back arcs, such as the Late Triassic to Early Jurassic Nicola Group in British Columbia.

AGE OF MINERALIZATION: Phanerozoic (mostly Cenozoic and Mesozoic); in British Columbia Au skarns are mainly of Early to Middle-Jurassic age. The unusual magnesian Au skarns of Western Australia are Archean.

HOST/ASSOCIATED ROCK TYPES: Gold skarns are hosted by sedimentary carbonates, calcareous clastics, volcanoclastics or (rarely) volcanic flows. They are commonly related to high to intermediate level stocks, sills and dikes of gabbro, diorite, quartz diorite or granodiorite composition. Economic mineralization is rarely developed in the endoskarn. The I-type intrusions are commonly porphyritic, undifferentiated, Fe-rich and calc-alkaline. However, the *Nambija*, *Wabu* and *QR* Au skarns are associated with alkalic intrusions.

DEPOSIT FORM: Variable from irregular lenses and veins to tabular or stratiform orebodies with lengths ranging up to many hundreds of metres. Rarely, can occur as vertical pipe-like bodies along permeable structures.

TEXTURE/STRUCTURE: Igneous textures in endoskarn. Coarse to fine-grained, massive granoblastic to layered textures in exoskarn. Some hornfelsic textures. Fractures, sill-dike margins and fold hinges can be an important loci for mineralization.

ORE MINERALOGY (Principal and subordinate): The gold is commonly present as micron-sized inclusions in sulphides, or at sulphide grain boundaries. To the naked eye, ore is generally indistinguishable from waste rock. Due to the poor correlation between Au and Cu in some Au skarns, the economic potential of a prospect can be overlooked if Cu-sulphide-rich outcrops are preferentially sampled and other sulphide-bearing or sulphide-lean assemblages are ignored. The ore in pyroxene-rich and garnet-rich skarns tends to have low Cu:Au (<2000:1), Zn:Au (<100:1) and Ag/Au (<1:1) ratios, and the gold is commonly associated with Bi minerals (particularly Bi tellurides).

Magnesian subtype: Native gold ± pyrrhotite ± chalcopyrite ± pyrite ± *magnetite* ± *galena* ± *tetrahedrite*.

Calcic subtype:

Pyroxene-rich Au skarns: Native gold ± pyrrhotite ± arsenopyrite ± *chalcopyrite* ± *tellurides* (e.g. *hedleyite*, *tetradymite*, *altaite* and *hessite*) ± *bismuthinite* ± *cobaltite* ± *native bismuth* ± *pyrite* ± *sphalerite* ± *maldonite*. They generally have a high sulphide content and high pyrrhotite:pyrite ratios. Mineral and metal zoning is common in the skarn envelope. At Nickel Plate for example, this comprises a narrow proximal zone of coarse-grained, garnet skarn containing high Cu:Au ratios, and a wider, distal zone of finer grained pyroxene skarn containing low Cu:Au ratios and the Au-sulphide orebodies.

Garnet-rich Au skarns: Native gold ± chalcopyrite ± pyrite ± arsenopyrite ± sphalerite ± magnetite ± hematite ± *pyrrhotite* ± *galena* ± *tellurides* ± *bismuthinite*. They generally have a low to moderate sulphide content and low pyrrhotite:pyrite ratios.

Epidote-rich Au skarn: Native gold ± chalcopyrite ± pyrite ± arsenopyrite ± hematite ± magnetite ± *pyrrhotite* ± *galena* ± *sphalerite* ± *tellurides*. They generally have a moderate to high sulphide content with low pyrrhotite:pyrite ratios.

EXOSKARN MINERALOGY (GANGUE):

Magnesian subtype: Olivine, clinopyroxene (Hd2-50), garnet (Ad7-30), chondrodite and monticellite. Retrograde minerals include serpentine, epidote, vesuvianite, tremolite-actinolite, phlogopite, talc, K-feldspar and chlorite.

Calcic subtype:

Pyroxene-rich Au skarns: Extensive exoskarn, generally with high pyroxene:garnet ratios. Prograde minerals include diopsidic to hedenbergitic clinopyroxene (Hd 20-100), K-feldspar, Fe-rich biotite, low Mn grandite garnet (Ad 10-100), wollastonite and vesuvianite. Other less common minerals include rutile, axinite and sphene. Late or retrograde minerals include epidote, chlorite, clinozoisite, vesuvianite, scapolite, tremolite-actinolite, sericite and prehnite.

Garnet-rich Au skarns: Extensive exoskarn, generally with low pyroxene:garnet ratios. Prograde minerals include low Mn grandite garnet (Ad 10-100), K-feldspar, wollastonite, diopsidic clinopyroxene (Hd 0-60), epidote, vesuvianite, sphene and apatite. Late or retrograde minerals include epidote, chlorite, clinozoisite, vesuvianite, tremolite-actinolite, sericite, dolomite, siderite and prehnite.

Epidote-rich Au skarns: Abundant epidote and lesser chlorite, tremolite-actinolite, quartz, K-feldspar, garnet, vesuvianite, biotite, clinopyroxene and late carbonate. At the *QR* deposit, epidote-pyrite and carbonate-pyrite veinlets and coarse aggregates are common, and the best ore occurs in the outer part of the alteration envelope, within 50 m of the epidote skarn front.

ENDOSKARN MINERALOGY (GANGUE): Moderate endoskarn development with K-feldspar, biotite, Mg-pyroxene (Hd 5-30) and garnet. Endoskarn at the epidote-rich *QR* deposit is characterized by calcite, epidote, clinozoisite and tremolite whereas at the *Butte Highlands* Mg skarn it contains argillic and propylitic alteration with garnet, clinopyroxene and epidote.

WEATHERING: In temperate and wet tropical climates, skarns often form topographic features with positive relief.

ORE CONTROLS: The ore exhibits strong stratigraphic and structural controls. Orebodies form along sill-dike intersections, sill-fault contacts, bedding-fault intersections, fold axes and permeable faults or tension zones. In the pyroxene-rich and epidote-rich types, ore commonly develops in the more distal portions of the alteration envelopes. In some districts, specific suites of reduced, Fe-rich intrusions are spatially related to Au skarn mineralization. Ore bodies in the garnet-rich Au skarns tend to lie more proximal to the intrusions.

GENETIC MODEL: Many Au skarns are related to plutons formed during oceanic plate subduction. There is a worldwide spatial, temporal and genetic association between porphyry Cu provinces and calcic Au skarns. Pyroxene-rich Au skarns tend to be hosted by siltstone-dominant packages and form in hydrothermal systems that are sulphur-rich and relatively reduced. Garnet-rich Au skarns tend to be hosted by carbonate-dominant packages and develop in more oxidising and/or more sulphur-poor hydrothermal systems.

ASSOCIATED DEPOSIT TYPES: Au placers ([C01](#), [C02](#)), calcic Cu skarns ([K01](#)), porphyry Cu deposits ([L04](#)) and Au-bearing quartz and/or sulphide veins ([I01](#), [I02](#)). Magnesian subtype can be associated with porphyry Mo deposits ([L05](#)) and possibly W skarns ([K05](#)). In British Columbia there is a negative spatial association between Au and Fe skarns at regional scales, even though both classes are related to arc plutonism. Fe skarns are concentrated in the Wrangellia Terrane whereas most Au skarn occurrences and all the economic deposits lie in Quesnellia.

COMMENTS: Most Au skarns throughout the world are calcic and are associated with island arc plutonism. However, the *Savage Lode* magnesian Au skarn occurs in the Archean

greenstones of Western Australia and the *Butte Highlands* magnesian Au skarn in Montana is hosted by Cambrian platformal dolomites. Note: although the Nickel Plate deposit lies distal to the Toronto stock in the pyroxene-dominant part of the skarn envelope, the higher grade ore zones commonly lie adjacent to sills and dikes where the exoskarn contains appreciable amounts of garnet with the clinopyroxene.

EXPLORATION GUIDES

GEOCHEMICAL SIGNATURE: Au, As, Bi, Te, Co, Cu, Zn or Ni soil, stream sediment and rock anomalies, as well as some geochemical zoning patterns throughout the skarn envelope (notably in Cu/Au, Ag/Au and Zn/Au ratios). Calcic Au skarns (whether garnet-rich or pyroxene-rich) tend to have lower Zn/Au, Cu/Au and Ag/Au ratios than any other skarn class. The intrusions related to Au skarns may be relatively enriched in the compatible elements Cr, Sc and V, and depleted in lithophile incompatible elements (Rb, Zr, Ce, Nb and La), compared to intrusions associated with most other skarn types.

GEOPHYSICAL SIGNATURE: Airborne magnetic or gravity surveys to locate plutons. Induced polarization and ground magnetic follow-up surveys can outline some deposits.

OTHER EXPLORATION GUIDES: Placer Au. Any carbonates, calcareous tuffs or calcareous volcanic flows intruded by arc-related plutons have a potential for hosting Au skarns. Favorable features in a skarn envelope include the presence of: (a) proximal Cu-bearing garnet skarn and extensive zones of distal pyroxene skarn which may carry micron Au, (b) hedenbergitic pyroxene (although diopsidic pyroxene may predominate overall), (c) sporadic As-Bi-Te geochemical anomalies, and, (d) undifferentiated, Fe-rich intrusions with low Fe₂O₃/FeO ratios. Any permeable calcareous volcanics intruded by high-level porphyry systems (particularly alkalic plutons) have a potential for hosting epidote-rich skarns with micron Au. During exploration, skarns of all types should be routinely sampled and assayed for Au, even if they are lean in sulphides.

ECONOMIC IMPORTANCE

TYPICAL GRADE AND TONNAGE: These deposits range from 0.4 to 13 Mt and from 2 to 15 g/t Au. Theodore *et al.* (1991) report median grades and tonnage of 8.6 g/t Au, 5.0 g/t Ag and 213 000 t. *Nickel Plate* produced over 71 tonnes of Au from 13.4 Mt of ore (grading 5.3 g/t Au). The 10.3 Mt *Fortitude* (Nevada) deposit graded 6.9 g/t Au whereas the 13.2 Mt *McCoy* skarn (Nevada) graded 1.5 g/t Au. The *QR* epidote-rich Au skarn has reserves exceeding 1.3 Mt grading 4.7 g/t Au.

IMPORTANCE: Recently, there have been some significant Au skarn deposits discovered around the world (e.g. *Buckhorn Mountain*, *Wabu*, *Fortitude*). Nevertheless, total historic production of Au from skarn (more than 1 000 t of metal) is minute compared to production from other deposit types. The *Nickel Plate* deposit (Hedley, British Columbia) was probably one of the earliest major Au skarns in the world to be mined. Skarns have accounted for about 16 % of British Columbia's Au production, although nearly half of this was derived as a byproduct from Cu and Fe skarns

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INTRUSION-RELATED Au PYRRHOTITE VEINS

I02

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Alldrick, D. J. (1996): Intrusion-related Au Pyrrhotite Veins, in Selected British Columbia Mineral Deposit Profiles, Volume 2 - Metallic Deposits, Lefebvre, D. V. and Höy, T, Editors, British Columbia Ministry of Employment and Investment, Open File 1996-13, pages 57-58.

IDENTIFICATION

SYNONYMS: Mesothermal veins, extension veins, transitional veins, contact aureole veins.

COMMODITIES (BYPRODUCTS): Au, Ag (Cu).

EXAMPLES (British Columbia (MINFILE #) - Canada/International): Scottie Gold ([104B 034](#)), Snip ([104B 250](#)), Johnny Mountain ([104B 107](#)), War Eagle ([082FSW097](#)), Le Roi ([082FSW093](#)), Centre Star ([082FSW094](#)); *no international examples known.*

GEOLOGICAL CHARACTERISTICS

CAPSULE DESCRIPTION: Parallel tabular to cymoid veins of massive sulphide and/or bull- quartz-carbonate with native gold, electrum and chalcopyrite are emplaced in a set of en echelon fractures around the periphery of a subvolcanic pluton. Many previous workers have included these veins as mesothermal veins.

TECTONIC SETTINGS: Volcanic arcs in oceanic and continental margin settings. Older deposits are preserved in accreted arc terranes.

DEPOSITIONAL ENVIRONMENT / GEOLOGICAL SETTING: The subvolcanic setting for these deposits is transitional between the setting for subvolcanic porphyry copper systems and for subvolcanic epithermal systems.

AGE OF MINERALIZATION: Recognized examples of this 'new' deposit type are all Early Jurassic.

HOST/ASSOCIATED ROCK TYPES: Hostrocks are andesitic tuffs, turbidites or early intrusive phases around the periphery of phaneritic, locally porphyritic, granodiorite stocks and batholiths.

DEPOSIT FORM: At various deposits the form has been described as: planar, en echelon vein sets, shear veins, cymoid veins, cymoid loops, sigmoidal veins, extension veins, tension gashes, ladder veins, and synthetic Reidel shear veins. Veins vary in width from centimetres to several metres and can be traced up to hundreds of metres.

TEXTURE/STRUCTURE: Two vein types may occur independently or together. Veins may be composed of (i) massive fine-grained pyrrhotite and/or pyrite, or (ii) massive bull quartz with minor calcite and minor to accessory disseminations, knots and crystal aggregates of sulphides. These two types of mineralization may grade into each other along a single vein or may occur in adjacent, but separate veins. Some veins have undergone post-ore ductile and brittle shearing that complicates textural and structural

interpretations.

ORE MINERALOGY (Principal and subordinate): Native gold, electrum, pyrite, pyrrhotite, sphalerite, galena, chalcopyrite, bornite, argentite, arsenopyrite, *magnetite*, *ilmenite*, *tetrahedrite*, *tennantite*, *molybdenite*, *cosalite*, *chalcocite*, *tellurobismuthite*, *hessite*, *volynskite*, *altaite*, *native bismuth*.

GANGUE MINERALOGY (Principal and subordinate): Quartz, calcite, ankerite, chlorite, *sericite*, *rhodochrosite*, *k-feldspar*, *biotite*.

ALTERATION MINERALOGY: Chlorite, sericite, pyrite, silica, carbonate, rhodochrosite, biotite, epidote, K-feldspar, ankerite. Alteration occurs as narrow (4 cm) vein selvages and as moderate alteration haloes extending up to several metres into the country rock.

ORE CONTROLS: Well defined faults and shears control the mineralization. Veins are peripheral to and spatially associated with porphyritic intrusive rocks which may host porphyry copper mineralization.

GENETIC MODEL: Mineralization is syn-intrusive and synvolcanic and formed along the thermally controlled 'brittle-ductile transition envelope' that surrounds subvolcanic intrusions. Late magma movement caused local shear stress, and resultant en echelon vein sets opened and were filled by sulphides and gangue minerals precipitating from circulating hydrothermal fluids. Subsequent shearing may have superimposed foliation or brecciation onto these early-formed veins.

ASSOCIATED DEPOSIT TYPES: Typical deposits of a volcanic arc, especially those in the subvolcanic setting: porphyry Cu+/-Mo+/-Au ([L04](#)), skarns, epithermal veins and breccias ([H04](#), [H05](#)), 'transitional' deposits (volcanogenic Cu-As-Sb-Au-Ag, [L01](#)) and surficial fumarolic hot spring ([H03](#)) and exhalative deposits.

COMMENTS: At least one of these deposits was initially interpreted as a volcanogenic exhalative sulphide lens because a massive sulphide vein was discovered in volcanic rocks with no obvious bedding.

EXPLORATION GUIDES

GEOCHEMICAL SIGNATURE: Elevated values of Au, Ag, Cu. (As, Zn).

GEOPHYSICAL SIGNATURE: Electromagnetic (ABEM and VLF-EM) and magnetometer (negative anomalies or 'magnetic troughs').

OTHER EXPLORATION GUIDES: Intense prospecting swath extending from 100 metres inside the intrusive contact to 1000 metres outside the intrusive contact of a prospective (sub-volcanic; Early Jurassic) pluton. Detailed soil geochemistry and detailed ground geophysics could be designed to investigate this same area. Small, 'hairline' mineralized fractures are good proximal indicators of a nearby major vein. Increased alteration intensity could also be a good proximal indicator, but this is a more subtle feature. Once the vein orientation on an initial discovery is determined, additional parallel veins should be anticipated and investigated with fences of drill holes.

ECONOMIC FACTORS

TYPICAL GRADE AND TONNAGE: Gold/silver ratios are close to 1:1. Copper may be a recoverable byproduct. Typical grades are 10 to 20 g/t Au.

IMPORTANCE: The Snip gold mine is currently British Columbia's largest gold producer and the Rossland veins are the province's second largest gold camp.

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PORPHYRY Cu+/-Mo+/-Au

L04

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Panteleyev, A. (1995): *Porphyry Cu+/-Mo+/-Au*, in *Selected British Columbia Mineral Deposit Profiles, Volume 1 - Metallics and Coal*, Lefebvre, D.V. and Ray, G.E., Editors, British Columbia Ministry of Energy of Employment and Investment, Open File 1995-20, pages 87-92.

IDENTIFICATION

SYNONYM: Calcalkaline porphyry Cu, Cu-Mo, Cu-Au.

COMMODITIES (BYPRODUCTS): Cu, Mo and Au are generally present but quantities range from insufficient for economic recovery to major ore constituents. Minor Ag in most deposits; rare recovery of Re from Island Copper mine.

EXAMPLES (British Columbia - Canada/International):

- ➡ Volcanic type deposits (Cu + Au * Mo) - Fish Lake ([092O 041](#)), Kemess ([094E 021,094](#)), Hushamu (EXPO, [092L 240](#)), Red Dog ([092L 200](#)), Poison Mountain ([092O 046](#)), Bell ([093M 001](#)), Morrison ([093M 007](#)), Island Copper ([092L 158](#)); Dos Pobres (USA); Far Southeast (Lepanto/Mankayan), Dizon, Guianaong, Taysan and Santo Thomas II (Philippines), Frieda River and Panguna (Papua New Guinea).
- ➡ Classic deposits (Cu + Mo * Au) - Brenda ([092HNE047](#)), Berg ([093E 046](#)), Huckleberry ([093E 037](#)), Schaft Creek ([104G 015](#)); Casino (Yukon, Canada), Inspiration, Morenci, Ray, Sierrita-Expanza, Twin Buttes, Kalamazoo and Santa Rita (Arizona, USA), Bingham (Utah, USA), El Salvador, (Chile), Bajo de la Alumbrera (Argentina).
- ➡ Plutonic deposits (Cu * Mo) - Highland Valley Copper ([092ISE001,011,012,045](#)), Gibraltar ([093B012,007](#)), Catface ([092F 120](#)); Chuquicamata, La Escondida and Quebrada Blanca (Chile).

GEOLOGICAL CHARACTERISTICS

CAPSULE DESCRIPTION: Stockworks of quartz veinlets, quartz veins, closely spaced fractures and breccias containing pyrite and chalcopyrite with lesser molybdenite, bornite and magnetite occur in large zones of economically bulk-mineable mineralization in or adjoining porphyritic intrusions and related breccia bodies. Disseminated sulphide minerals are present, generally in subordinate amounts. The mineralization is spatially, temporally and genetically associated with hydrothermal alteration of the hostrock intrusions and wallrocks.

TECTONIC SETTINGS: In orogenic belts at convergent plate boundaries, commonly linked to subduction-related magmatism. Also in association with emplacement of high-level stocks during extensional tectonism related to strike-slip faulting and back-arc spreading following continent margin accretion.

DEPOSITIONAL ENVIRONMENT / GEOLOGICAL SETTING: High-level (epizonal) stock emplacement levels in volcano-plutonic arcs, commonly oceanic volcanic island and continent-margin arcs. Virtually any type of country rock can be mineralized, but commonly the high-level stocks and related dikes intrude their coeval and cogenetic volcanic piles.

AGE OF MINERALIZATION: Two main periods in the Canadian Cordillera: the Triassic/Jurassic (210-180 Ma) and Cretaceous/Tertiary (85-45 Ma). Elsewhere deposits are mainly Tertiary, but range from Archean to Quaternary.

HOST/ASSOCIATED ROCK TYPES: Intrusions range from coarse-grained phaneritic to porphyritic stocks, batholiths and dike swarms; rarely pegmatitic. Compositions range from calcalkaline quartz diorite to granodiorite and quartz monzonite. Commonly there is multiple emplacement of successive intrusive phases and a wide variety of breccias. Alkalic porphyry Cu-Au deposits are associated with syenitic and other alkalic rocks and are considered to be a distinct deposit type (see model [L03](#)).

DEPOSIT FORM: Large zones of hydrothermally altered rock contain quartz veins and stockworks, sulphide-bearing veinlets; fractures and lesser disseminations in areas up to 10 km² in size, commonly coincident wholly or in part with hydrothermal or intrusion breccias and dike swarms. Deposit boundaries are determined by economic factors that outline ore zones within larger areas of low-grade, concentrically zoned mineralization. Cordilleran deposits are commonly subdivided according to their morphology into three classes - classic, volcanic and plutonic (see Sutherland Brown, 1976; McMillan and Panteleyev, 1988):

* Volcanic type deposits (e.g. Island Copper) are associated with multiple intrusions in subvolcanic settings of small stocks, sills, dikes and diverse types of intrusive breccias. Reconstruction of volcanic landforms, structures, vent-proximal extrusive deposits and subvolcanic intrusive centres is possible in many cases, or can be inferred. Mineralization at depths of 1 km, or less, is mainly associated with breccia development or as lithologically controlled preferential replacement in hostrocks with high primary permeability. Propylitic alteration is widespread and generally flanks early, centrally located potassic alteration; the latter is commonly well mineralized. Younger mineralized phyllic alteration commonly overprints the early mineralization. Barren advanced argillic alteration is rarely present as a late, high-level hydrothermal carapace.

* Classic deposits (e.g., Berg) are stock related with multiple emplacements at shallow depth (1 to 2 km) of generally equant, cylindrical porphyritic intrusions. Numerous dikes and breccias of pre, intra, and post-mineralization age modify the stock geometry. Orebodies occur along margins and adjacent to intrusions as annular ore shells. Lateral outward zoning of alteration and sulphide minerals from a weakly mineralized potassic/propylitic core is usual. Surrounding ore zones with potassic (commonly biotite-rich) or phyllic alteration contain molybdenite * chalcopyrite, then chalcopyrite and a generally widespread propylitic, barren pyritic aureole or 'halo'.

* Plutonic deposits (e.g., the Highland Valley deposits) are found in large plutonic to batholithic intrusions immobilized at relatively deep levels, say 2 to 4 km. Related dikes and intrusive breccia bodies can be emplaced at shallower levels. Hostrocks are phaneritic coarse grained to porphyritic. The intrusions can display internal compositional differences as a result of differentiation with gradational to sharp boundaries between the different phases of magma emplacement. Local swarms of dikes, many with associated breccias, and fault zones are sites of mineralization. Orebodies around silicified alteration zones tend to occur as diffuse vein stockworks carrying chalcopyrite, bornite and minor pyrite in intensely fractured rocks but, overall, sulphide minerals are sparse. Much of the early potassic and phyllic alteration in central parts of orebodies is restricted to the margins of mineralized fractures as selvages. Later phyllic-argillic alteration forms envelopes on the veins and fractures and is more pervasive and widespread. Propylitic alteration is widespread but unobtrusive and is indicated by the presence of rare pyrite with chloritized mafic minerals, saussuritized plagioclase and small amounts of epidote.

TEXTURE/STRUCTURE: Quartz, quartz-sulphide and sulphide veinlets and stockworks; sulphide grains in fractures and fracture selvages. Minor disseminated sulphides commonly replacing primary mafic minerals. Quartz phenocrysts can be partially resorbed and overgrown by silica.

ORE MINERALOGY (Principal and subordinate): Pyrite is the predominant sulphide mineral; in some deposits the Fe oxide minerals magnetite, and rarely hematite, are abundant. Ore minerals are chalcopyrite; molybdenite, lesser bornite and rare (primary) chalcocite. Subordinate minerals are *tetrahedrite/tennantite*, *enargite* and *minor gold*, *electrum* and *arsenopyrite*. In many deposits late veins commonly contain galena and sphalerite in a gangue of quartz, calcite and barite.

GANGUE MINERALOGY (Principal and subordinate): Gangue minerals in mineralized veins are mainly quartz with lesser *biotite*, *sericite*, *K-feldspar*, *magnetite*, *chlorite*, *calcite*, *epidote*, *anhydrite* and *tourmaline*. Many of these minerals are also pervasive alteration products of primary igneous mineral grains.

ALTERATION MINERALOGY: Quartz, sericite, biotite, K-feldspar, albite, anhydrite/gypsum, magnetite, actinolite, chlorite, epidote, calcite, clay minerals, tourmaline. Early formed alteration can be overprinted by younger assemblages. Central and early formed potassic zones (K-feldspar and biotite) commonly coincide with ore. This alteration can be flanked in volcanic hostrocks by biotite-rich rocks that grade outward into propylitic rocks. The biotite is a fine-grained, 'shreddy' looking secondary mineral that is commonly referred to as an early developed biotite (EDB) or a 'biotite hornfels'. These older alteration assemblages in cupriferous zones can be partially to completely overprinted by later biotite and K-feldspar and then phyllic (quartz-sericite-pyrite) alteration, less commonly argillic, and rarely, in the uppermost parts of some ore deposits, advanced argillic alteration (kaolinite-pyrophyllite) .

WEATHERING: Secondary (supergene) zones carry chalcocite, covellite and other Cu₂S minerals (digenite, djurleite, etc.), chrysocolla, native copper and copper oxide, carbonate and sulphate minerals. Oxidized and leached zones at surface are marked by ferruginous 'cappings' with supergene clay minerals, limonite (goethite, hematite and jarosite) and residual quartz.

ORE CONTROLS: Igneous contacts, both internal between intrusive phases and external with wallrocks; cupolas and the uppermost, bifurcating parts of stocks, dike swarms. Breccias, mainly early formed intrusive and hydrothermal types. Zones of most intensely developed fracturing give rise to ore-grade vein stockworks, notably where there are coincident or intersecting multiple mineralized fracture sets.

ASSOCIATED DEPOSIT TYPES: Skarn Cu ([K01](#)), porphyry Au ([K02](#)), epithermal Au-Ag in low sulphidation type ([H05](#)) or epithermal Cu-Au-Ag as high-sulphidation type enargite-bearing veins ([L01](#)), replacements and stockworks; auriferous and polymetallic base metal quartz and quartz-carbonate veins ([I01](#), [I05](#)), Au-Ag and base metal sulphide mantos and replacements in carbonate and non- carbonate rocks (M01, [M04](#)), placer Au ([C01](#), [C02](#)).

COMMENTS: Subdivision of porphyry copper deposits can be made on the basis of metal content, mainly ratios between Cu, Mo and Au. This is a purely arbitrary, economically based criterion, an artifact of mainly metal prices and metallurgy. There are few differences in the style of mineralization between deposits although the morphology

of calcalkaline deposits does provide a basis for subdivision into three distinct subtypes - the 'volcanic, classic, and plutonic' types. A fundamental contrast can be made on the compositional differences between calcalkaline quartz-bearing porphyry copper deposits and the alkalic (silica undersaturated) class. The alkalic porphyry copper deposits are described in a separate model - [L03](#).

EXPLORATION GUIDES

GEOCHEMICAL SIGNATURE: Calcalkalic systems can be zoned with a cupriferous (* Mo) ore zone having a 'barren', low-grade pyritic core and surrounded by a pyritic halo with peripheral base and precious metal-bearing veins. Central zones with Cu commonly have coincident Mo, Au and Ag with possibly Bi, W, B and Sr. Peripheral enrichment in Pb, Zn, Mn, V, Sb, As, Se, Te, Co, Ba, Rb and possibly Hg is documented. Overall the deposits are large-scale repositories of sulphur, mainly in the form of metal sulphides, chiefly pyrite.

GEOPHYSICAL SIGNATURE: Ore zones, particularly those with higher Au content, can be associated with magnetite-rich rocks and are indicated by magnetic surveys. Alternatively the more intensely hydrothermally altered rocks, particularly those with quartz-pyrite-sericite (phyllic) alteration produce magnetic and resistivity lows. Pyritic haloes surrounding cupriferous rocks respond well to induced polarization (I.P.) surveys but in sulphide-poor systems the ore itself provides the only significant IP response.

OTHER EXPLORATION GUIDES: Porphyry deposits are marked by large-scale, zoned metal and alteration assemblages. Ore zones can form within certain intrusive phases and breccias or are present as vertical 'shells' or mineralized cupolas around particular intrusive bodies. Weathering can produce a pronounced vertical zonation with an oxidized, limonitic leached zone at surface (leached capping), an underlying zone with copper enrichment (supergene zone with secondary copper minerals) and at depth a zone of primary mineralization (the hypogene zone).

ECONOMIC FACTORS

TYPICAL GRADE AND TONNAGE:

- ➡ Worldwide according Cox and Singer (1988) based on their subdivision of 55 deposits into subtypes according to metal ratios, typical porphyry Cu deposits contain (median values): Porphyry Cu-Au: 160 Mt with 0.55 % Cu, 0.003 % Mo, 0.38 g/t Au and 1.7 g/t Ag. Porphyry Cu-Au-Mo: 390 Mt with 0.48 % Cu, 0.015 % Mo, 0.15 g/t Au and 1.6 g/t Ag. Porphyry Cu-Mo: 500 Mt with 0.41 % Cu, 0.016 % Mo, 0.012 g/t Au and 1.22 g/t Ag.
- ➡ A similar subdivision by Cox (1986) using a larger data base results in: Porphyry Cu: 140 Mt with 0.54 %Cu, <0.002 % Mo, <0.02g/t Au and <1 g/t Ag. Porphyry Cu-Au: 100 Mt with 0.5 %Cu, <0.002 % Mo, 0.38g/t Au and 1g/t Ag. (This includes deposits from the British Columbia alkalic porphyry class, B.C. model L03.) Porphyry Cu-Mo: 500 Mt with 0.42 % Cu, 0.016 % Mo, 0.012 g/t Au and 1.2 g/t Ag.
- ➡ British Columbia porphyry Cu * Mo ± Au deposits range from <50 to >900 Mt with commonly 0.2 to 0.5 % Cu, <0.1 to 0.6 g/t Au, and 1 to 3 g/t Ag. Mo contents are variable from negligible to 0.04 % Mo. Median values for 40 B.C. deposits with reported reserves are: 115 Mt with 0.37 % Cu, *0.01 % Mo, 0.3g /t Au and 1.3 g/t Ag.

ECONOMIC LIMITATIONS: Mine production in British Columbia is from primary (hypogene) ores. Rare exceptions are Afton mine where native copper was recovered

has provided some economic benefits.

END USES: Porphyry copper deposits produce Cu and Mo concentrates, mainly for international export.

IMPORTANCE: Porphyry deposits contain the largest reserves of Cu, significant Mo resources and close to 50 % of Au reserves in British Columbia.

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ALASKAN-TYPE Pt+/-Os+/-Rh+/-Ir

M05

by Graham T. Nixon

British Columbia Geological Survey



Nixon, G. T. (1996): *Alaskan-type Pt+/-Os+/-Rh+/-Ir*, in *Selected British Columbia Mineral Deposit Profiles, Volume 2 - Metallic Deposits*, Lefebvre, D.V. and Höy, T, Editors, British Columbia Ministry of Employment and Investment, Open File 1996-13, pages 113-116.

IDENTIFICATION

SYNONYMS: Zoned ultramafic, Uralian-type, Alaskan-type.

COMMODITIES (BYPRODUCTS): Pt (Ir, Os, Rh, magnetite).

EXAMPLES (British Columbia - Canada/International): Tulameen Complex and associated placers; magnetite plus trace platinum group elements (PGE) -Lodestone Mountain ([092HSE034](#)), Tanglewood Hill ([092HSE035](#)); chromite - Grasshopper Mountain ([092HNE011](#)); olivine - Grasshopper Mountain Olivine ([092HNE189](#)); *Red Mountain, Goodnews Bay (Alaska, USA)*, *Tin Cup Peak (Oregon, USA)*, *Ural Mountains and Aldan Shield (Russia)*, *Fifield district (NSW, Australia)*.

GEOLOGICAL CHARACTERISTICS

CAPSULE DESCRIPTION: Ultramafic intrusive complexes, commonly zoned, forming sills, stocks or intrusive bodies with poorly known external geometry. Subeconomic platinum group elements in lode occurrences are associated with: 1) thin (centimetre-scale), disrupted chromitite layers, 2) thick (metre-scale) concentrations of cumulus magnetite or 3) clinopyroxenite. Economic placer deposits appear to be derived predominantly from chromitite- hosted PGE occurrences.

TECTONIC SETTINGS: Traditionally subdivided into orogenic (unstable) and platformal (stable) environments. In British Columbia, Alaskan-type complexes were emplaced during an episode of Cordillera-wide, subduction-related arc magmatism followed by an episode of orogenic compression.

DEPOSITIONAL ENVIRONMENT / GEOLOGICAL SETTING: Zoned to crudely layered ultramafic- mafic intrusive complexes with rarely preserved (or poorly documented) metamorphic aureoles. Intrusive margins are commonly faulted. Traditionally viewed as deep-seated cumulates diapirically re-emplaced at high levels in the crust. In British Columbia, at least, most intrusions appear to represent cumulate deposition in upper crustal (subvolcanic?) magma chambers and the diapiric re-emplacement model lacks definitive supporting evidence.

AGE OF MINERALIZATION: Precambrian to late Mesozoic; most Alaskan-type complexes in British Columbia appear to be mid-Triassic to late Early Jurassic in age.

HOST/ASSOCIATED ROCK TYPES: Predominantly dunite, wehrlite, olivine clinopyroxenite, clinopyroxenite, hornblende clinopyroxenite,

clinopyroxene hornblendite, hornblende- and/or clinopyroxene-bearing gabbro/diorite. Minor lithologies include chromitite, magnetitite, olivine-hornblende clinopyroxenite, and hornblendite. Associated feldspar-bearing lithologies include gabbro/diorite, monzonite, monzodiorite and minor alkali-feldspar syenite and hornblende- feldspar $\pm$ quartz $\pm$ biotite pegmatite.

DEPOSIT FORM: Lode occurrences of PGEs are primarily controlled by magmatic cumulate stratigraphy:

- ➡ 1) chromitites are restricted to dunites where they form thin discontinuous layers or schlieren, pods and nodular masses seldom more than a metre in length;
- 2) magnetitites and concentrations of cumulus magnetite form well bedded, locally continuous layers up to six m thick intercalated with hornblende clinopyroxenite;
- 3) lenses and vein-like bodies of relatively coarse-grained or "pegmatoid", biotite and magnetite-poor, PGE-bearing clinopyroxenites are enclosed by finer grained, biotite and magnetite-rich, PGE-poor clinopyroxenites.

TEXTURE/STRUCTURE: Cumulus and intercumulus textures are most common; poikilitic textures may predominate locally, especially in hornblende-bearing lithologies. Comparatively rare macroscopic layering. Euhedral to subhedral chromite concentrations form networks around olivine or discrete wispy or thin layers in dunite. Chromitites typically form schlieren and nodular masses due to syndepositional remobilization. Magnetite-rich accumulations usually form thin to thick bedded layers in hornblende clinopyroxenite. Tectonic deformation, commonly in the form of ductile shear fabrics, is locally superimposed on magmatic textures, and is especially prevalent at intrusive contacts.

ORE MINERALOGY (Principal and subordinate): Three types of PGE mineral (PGM) associations are recognized in lode occurrences: 1) chromitite-PGM association, principally chromite and Pt-Fe(-Cu-Ni) alloys (e.g. tetraferroplatinum, isoferroplatinum, rare *native platinum*, *tulameenite*) and minor *Os-Ir* and *Pt-Ir* alloys, *Rh-Ir sulpharsenides* (*hollingworthite-irarsite* series), *sperrylite* (*PtAs₂*), *geversite* (*PtSb₂*), and *laurite* (*RuS₂*); 2) magnetitite-PGM association (not well documented), principally magnetite (Ti-V-rich in certain cases) and Pt-Fe and Os-Ir alloys, and rare cooperite (*PtS*); 3) clinopyroxenite-PGM association (known from a single locality - Fifield, NSW, Australia), principally Pt-Fe alloys (isoferroplatinum-tetraferroplatinum), *erlichmanite* (*OsS₂*), cooperite, and *sperrylite-geversite*. Minor amounts of *base metal sulphides* (*chalcopyrite*, *pentlandite*, *pyrrhotite*, *pyrite*, *bornite*, *violarite*, *bravoite*, *millerite*, *heazlewoodite*) generally accompany the PGM in all three associations.

GANGUE MINERALOGY (Principal and subordinate): The principal gangue minerals include olivine, chrome spinel, clinopyroxene, and hornblende in ultramafic rocks; hornblende, clinopyroxene and plagioclase in gabbroic/dioritic rocks; and hornblende, quartz (rare) and alkali feldspar in leucocratic differentiates. Orthopyroxene is characteristically absent as a cumulus phase but may form very rare intercumulus grains. Accessory magnetite and apatite are generally common, and locally abundant in hornblende clinopyroxenite; sphene and zircon occur in felsic differentiates;

phlogopite-biotite is particularly widespread as an accessory phase in British Columbia.

ALTERATION MINERALOGY: Secondary PGM are minor and closely associated with the primary PGM alloys. Remobilization of PGE is believed to be extremely limited and may be commonly related to postmagmatic serpentinization processes acting during regional metamorphism and deformation.

WEATHERING: It has been argued by some that the PGE found in placer occurrences may owe their origin to the hydromorphic dispersion and precipitation of PGE during normal weathering processes. The debate continues, but it is clear from a variety of textural, mineralogical and isotopic (Re-Os) data that the common placer PGE occurrences are the products of mechanical degradation of magmatic lode occurrences and not surficial remobilization processes.

ORE CONTROLS: The PGM appear to be restricted to chromitite, magnetite-rich or clinopyroxenite layers which formed by primary magmatic crystallization processes. The chromite is typically associated with dunite whereas the magnetite is found with clinopyroxenite.

GENETIC MODEL: The origin of the PGE in Alaskan-type deposits is magmatic with very limited low-temperature remobilization. A low sulphidation, relatively high oxidation magmatic environment (subduction-related?) appears to be an important genetic control. The chromitites in dunite and, to a much lesser extent, the magnetite-rich layers in clinopyroxenite, appear to be the ultimate source of the placer PGE.

ASSOCIATED DEPOSIT TYPES: Placer deposits ([C01](#), [C02](#)) are extremely important since they have been the only significant economically recoverable source of PGE associated with Alaskan-type complexes. Some lode deposits have been worked in Russia but their documentation is extremely poor.

COMMENTS: All of the world's most important Alaskan-derived placers appear to be related to concentrations of PGE in chromitites. Gold in these placers appears to have been derived from a separate source. Magnetite accumulations in clinopyroxenites of the Tulameen Complex have been explored for magnetite.

EXPLORATION GUIDES

GEOCHEMICAL SIGNATURE: Primarily Pt, with subsidiary Os, Rh and Ir; other elements such as Cu, Ni, and Cr may be locally important. Geochemical pathfinder elements for PGE, such as As and Sb, may also be important.

GEOPHYSICAL SIGNATURE: Primarily magnetic; gravity may be important.

OTHER EXPLORATION GUIDES: Stream sediment sampling of heavy mineral concentrates for PGE is a key exploration tool; in favourable

circumstances PGE geochemistry and platinum nugget mineralogy can uniquely distinguish an Alaskan-type heritage from all other common PGE environments.

ECONOMIC FACTORS

TYPICAL GRADE AND TONNAGE: PGE concentrations in grab samples from lode deposits are extremely spotty such that reliable tonnages and grades are not available. The associated placer deposits are likewise extremely variable. Maximum grade of Pt from the Goodnews Mining Company records, Alaska (1957) was approximately “\$37 per cubic yard” at February 1993 prices. Placers in the Tulameen district reportedly yielded some 620 kg of impure platinum between 1889 and 1936. Some of the placer deposits in the former Soviet Union have yielded exceptional platinum nuggets of up to 11.3 kg.

ECONOMIC LIMITATIONS: The chromitite-PGE association appears to be the most important in British Columbia; without exception, all of these chromitite occurrences are small, dispersed throughout a dunite host, and all have been remobilized soon after deposition within the high-temperature magmatic environment. A small open pit operation appears to be the only potentially economic method of PGE extraction. The occurrence of the PGE as small micrometre-size inclusions in refractory chromite poses problems for processing.

END USES: PGE are primarily used as high-temperature catalysts in a variety of industries, perhaps the most familiar being platinum for automobile catalytic converters. Other uses include medical and electronic (fuel cells, thermocouples), and platinum is used in jewelry.

IMPORTANCE: PGE are classed as a strategic commodity. The most important producers are South Africa and Russia.

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Appendix B

Notes on the Theory of Induced Polarization

The following general description of induced polarization theory, *in italics*, is from Hallof, P.G., (1963).

Induced Polarization as a geophysical measurement refers to the blocking action or polarization of metallic or electronic conductors in a medium of ionic conduction.

This electro-chemical phenomenon occurs wherever electrical current is passed through an area which contains metallic minerals such as base metal sulphides. Normally, when current is passed through the ground, as in resistivity measurements, all of the conduction takes place through ions present in the water content of the rock, or soil, i.e. by ionic conduction. This is because almost all minerals have a much higher specific resistivity than ground waters. The induced polarization effect takes place at those interfaces where the mode of conduction changes from ionic in the solutions filling the interstices of the rock to electronic in the metallic minerals present in the rock. The blocking action or induced polarization mentioned above, which depends upon the chemical energies necessary to allow the ions to give up or receive electrons from the metallic surface, increases with the time that a DC current is allowed to flow through the rock; i.e. as ions pile up against the metallic interface the resistance to current flow increases. Eventually, there is enough polarization in the form of excess ions at the interfaces to effectively stop all current flow through the metallic particle. This polarization takes place at each infinite number of solution-metal interfaces in a mineralized rock.

When DC voltage used to create this DC current flow is cut off, the Coulomb forces between the charged ions forming the polarization cause them to return to their normal position. This movement of charge creates a small current flow which can be measured on the surface of the ground as a decaying potential difference.

From an alternate viewpoint it can be seen that if the direction of the current through the system is reversed repeatedly before the polarization occurs, the effective resistivity of the system as a whole will change as the frequency of the switching is changed. This is a consequence of the fact that the amount of current flowing through each metallic interface depends upon the length of time that current has been passing through it in one direction.

The values of the 'metal factor' are a measure of the amount of polarization present in the rock mass being surveyed. This parameter has been very successful in mapping areas of sulphide mineralization, even those in which all other geophysical methods have been unsuccessful. The induced polarization measurement is more sensitive to sulphide content than other electrical measurements because it is much more dependent upon sulphide content. As the sulphide content of a rock is increased, the 'metal factor' of the rock increases much more rapidly than the resistivity decreases.

Because of this increased sensitivity, it is possible to locate and outline zones of less than 10% sulphides that can't be located by EM methods. The method has been successful in locating disseminated porphyry-copper type mineralization. Also, it should be possible to locate most massive sulphide bodies at a greater depth with IP than with EM.

Since there is no IP effect from any conductor unless it is metallic, the method is useful in checking EM anomalies that are suspected of being due to water filled shear zones or other ionic conductors. There is also no effect from conductive overburden, which frequently confuses EM results. The apparent metal factors measured over a mineralized zone are larger if the material overlying the zone is of lower resistivity.

It should be stated that the induced polarization measurements indicate the total amount of metallic constituents in the rock. Thus all of the metallic minerals in the rock, such as pyrite, etc. are responsible for the IP effect. Some oxides such as magnetite, pyrolusite, chromite and some forms of hematite also conduct by electrons and are metallic. All of the metallic minerals in the rock will contribute to the IP effect measured on the surface.

Appendix C

Notes on Interpretation of 'Conventional' and Titan-24 IP Surveys

'Conventional' IP Survey:

In an induced polarization survey current is applied to the ground. The potentials are measured at two points, in line with the current electrode. Measurements are made along a surveyed line, with a constant distance between the current and potential electrodes. The resulting data, when plotted on 'pseudo' sections, usually appears to have a 45° grain or dip toward the transmitter, (toward north in this survey). This does not necessarily reflect the geological orientation but is an artifact of the pole-dipole array used.

High chargeability could be an indicator of greater (disseminated) metal content in the rock. Low resistivity could be an indicator of higher metal content in massive or stringer form. "Metal factor", also often shown on IP sections, is a mathematical composite of chargeability with resistivity where high metal factor occurs where chargeability is high and resistivity is low. Inversion modeling also uses mathematical processing to provide a true subsurface distribution of the resistivity and IP effects and the location of anomalies of potential interest.

Titan-24 IP Survey:

The Titan-24 Distributed Array System of Quantec Geoscience Inc. combines high resolution and deep targeting capabilities. The system combines a Tensor Magnetotelluric Resistivity (MT) method), and a Galvanic DC Resistivity and Induced Polarization (DCIP) surveys. The MT and DC data both measure the same physical property – resistivity, which may be an indicator of metallic mineralization or of the rock porosity, alteration or mineral grain fabric. IP measures 'chargeability' a near direct indicator of mineralization, both massive and disseminated.

MT measures the subsurface resistivity to great depths (>1.5 km). Natural time variations in the Earth's magnetic field, due to oscillations in the ionosphere and lightning, induce electric current in the ground. MT measures these natural signals.

DCIP is an electrical method which uses the injection of current and the measurement of voltage and its rate of decay to determine the subsurface resistivity and chargeability. DCIP benefits from superior shallow to mid-depth resolution and penetration (<500-750m) and sensitivity to disseminated to massive metallic mineralization.

The 'conventional' and Titan-24 survey data undergo various processing techniques in computer modelling sometimes resulting in different interpretations of the data. Inversion models are constructed which best fit the data, within the context of the model norm used. The inversion-processed 'pseudo' section plots do not have the 45° grain to the data as do the unprocessed 'conventional' IP sections.

Appendix D
Glossary of Technical Terms and Abbreviations

Ag	Silver.
Anomalous	Chemical and mineralogical changes and higher than typical background values in elements in a rock resulting from reaction with hydrothermal fluids or increase in pressure or temperature.
Anomaly	The geographical area corresponding to anomalous geochemical or geophysical values.
Argentiferous	Containing silver.
As	Arsenic.
Au	Gold.
Background	The typical concentration of an element or geophysical response in an area, generally referring to values below some threshold level, above which values are designated as anomalous.
BCGS	British Columbia Geological Survey
Cd	Cadmium.
cm	Centimetre
Cu	Copper.
DCIP	An electrical method which uses the injection of current and the measurement of voltage and its rate of decay to determine the subsurface resistivity and chargeability.
DDH	Diamond drill hole.
EM	Electromagnetic.
Float	Loose rocks or boulders; the location of the bedrock source is not known.
Grab sample	A sample of a single rock or selected rock chips collected from within a restricted area of interest.
g/t	Grams per tonne (metric tonne).

34.29 g/t (metric tonnes) = 1.00 oz/T (short tons)

Ha	Hectare - an area totalling 10,000 square metres, e.g., an area 100 metres by 100 metres.
HLEM	Horizontal loop electromagnetic.
Intrusive	A magmatic rock that cuts into and alters older rocks and may be the source of minerals deposited into the rocks intruded, creating skarn or porphyry type mineral deposits.
IP	Induced polarization.
km	Kilometre.
Mag/vlf	Magnetic and VLF-EM geophysical surveys.
Max-min	An HLEM technique to test for resistivity and conductivity of rocks.
Mo	Molybdenum.
MT	Magnetotelluric. A electrical method that uses natural variations in the Earth's magnetic field to induce electric current in the ground to determine the subsurface resistivity.
NI 43-101	National Instrument 43-101 is a mineral resource classification and is a national instrument for the <i>Standards of Disclosure for Mineral Projects</i> with the Canadian Securities Administrators. The NI is a strict guideline for how public Canadian companies can disclose scientific and technical information about mineral projects. Disclosures include press releases, presentations, oral comments, and websites. The instrument requires that a "Qualified Person" be attributed to the information. A qualified person is defined as: • an engineer or geoscientist with at least 5 years experience in the mineral resources field • a subject matter expert in the mineral resources field and has a professional association.
NW-SE	Northwest - southeast.
Orogen	The physical manifestations of the process of mountain building. Orogens are usually long, thin, arcuate tracts of rock that have a pronounced linear structure resulting in terranes.
oz/T	ounces per ton (Imperial measurement).

	34.29 g/t (metric tonnes) = 1.00 oz/T (short tons)
oz/st	ounces per short ton (Imperial measurement, same as oz/T). 34.29 g/t (metric tonnes) = 1.00 oz/st (short tons)
Pathfinder	Elements that occur in anomalous amounts together with the economic element being explored for.
PGE	Platinum group elements: platinum, palladium, osmium, iridium, rhodium, ruthenium.
Pb	Lead.
Porphyry	A deposit where primarily Cu-bearing minerals occur in disseminated grains or veinlets through a large volume of rock within or in close association with intrusive igneous rocks. Au and Mo are also important products of porphyry deposits.
ppb	Parts per billion.
ppm	Parts per million (1 ppm = 1,000 ppb = 1 g/t)
Protolith	The original rock before it was metamorphosed.
Pt	Platinum.
Skarn	Forms by chemical metasomatism of rocks in the contact zone of intrusive rocks with rocks often containing carbonate minerals. Skarns in the igneous environment are associated with hornfels and wider zones of calc-silicate rocks. Skarns are often hosts for copper, lead, zinc, iron, gold, molybdenum, tin, and tungsten ore deposits.
Sb	Antimony.
Takla Group	<i>Takla Group has been applied to rocks identical to the Quesnel belt rocks...Equivalent rocks to the south...are generally referred to as Nicola Group... The term Takla leads to ambiguity because in northern British Columbia it has been used for rocks in both Quesnel and Stikine terranes...The usage for the Triassic-Jurassic volcanic arc and related rocks in Quesnellia currently preferred is Nicola Group. The term Takla Group possibly should be discarded... (Panteleyev et al., (1996).</i>
Terrain	An arbitrarily defined geographic location.

Terrane	A major crustal block with a particular geologic history. (See Section 9.0 for more).
VLF-EM	Very low frequency electromagnetic.
Zn	Zinc