## AIRBORNE GEOPHYSICAL INTERPRETATION REPORT

# ON THE

# **MAX-K2 PROPERTY**

# **OMINECA MINING DIVISION**

# NTS 093K/16E OR 093K.100

54° 56' North Latitude, 124° 02' West Longitude

For Anthony James Hewett Vancouver B.C.

By

D. E. Blann, P.Eng. Standard Metals Exploration Ltd August 12, 2010

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Shives, Robert, 2010, Interpretation Report of 1995 Regional Fixed Win

Airborne Gamma Ray Spectrometric/Magnetic Data over the MAX PROPERT

Omineca Mining Division, British Columbia Canada NTS 93K/16E.

## Summary

The MAX property is located approximately 57 kilometres northeast of Ft St James, British Columbia. The Mount Milligan copper-gold deposit (Minfile 093N194) owned by Terrane Metals Inc., is located approximately 22 kilometres to the north of the Max property, and the Tas property (Minfile 093K080) is located approximately 14 kilometres to the west. The Mount Milligan copper-gold deposit, containing mineable reserves of 6.0 million ounces of gold and 2.0 billion pounds of copper is currently at the construction stage and is located approximately 22 kilometres to the north. The MAX property is owned 100% by Anthony James Hewett.

The MAX property is 41 square kilometres in area and was explored largely between 1988 and 1991 by Rio Algom Explorations Inc., and again briefly in 2007 by Standard Metals Exploration Ltd. The exploration consisted of stream sediment, soil and rock geochemical, geological, limited ground geophysical, and an airborne VLF-EM and magnetic geophysical survey. Together, this work outlined favorable lithology and an alteration and pyrite-pyrrhotite bearing sulphide system approximately 25 square kilometres in dimension, one of the largest in the area. Important, multi-phase high-magnetite bearing diorite and monzonite intrusions occur that are similar to those within and adjacent the Mount Milligan deposits. Exploration results from Rio Algom include a coincident copper and gold in soil anomaly between 1.0 to 2.5 kilometres in length and 0.5 to 1.5 kilometres in width with test pits locally containing up to 3.3 g/t gold. In 2007, results include up to 2725.8 ppb (2.7 g/t) gold in a pan concentrate, and 475.1 ppb (0.47g/t) gold with 98.1 ppm copper in a silt sample. Anomalous values of up to 1.8 ppm silver and 20 ppb rhenium were also obtained in silt samples and a reconnaissance soil line in the northeast portion of the Max property returned up to 193 ppm copper, and 106.1 ppb gold, and rock samples returned up to 7156 ppm (0.71%) copper, 40840 ppb (40.8 g/t) silver from narrow quartz carbonate chalcopyrite filled shear zones.

During 2010, a detailed review and analyses of the 1995 Airborne Geophysical survey was performed by Dr. Rob Shives of GamX Inc., whom in part conducted and supervised the original airborne survey and is recognized as an expert in the field of radiometric, geophysical/geochemical surveys. In order to facilitate this interpretation, historical geochemical data was manually entered into spreadsheets, and using Autocad and GIS software, historical data was converted into NAD83 UTM coordinates. It is concluded the MAX property holds good potential for alkaline style bulk tonnage coppergold mineralization and several priority targets for follow exploration work is recommended.

## 1. Location and Access

The Max property is located approximately 57 kilometres north of Ft. St. James, British Columbia (Figure 1). The center of the claims is approximately 0432000E and 6088000N based on the NAD 83 UTM system. The Mount Milligan copper-gold deposit (Minfile 093N194) owned by Terrane Metals Inc., is located approximately 22 kilometres to the north of the Max property, and the Tas property (Minfile 093K080) is located approximately 14 kilometres to the west.

Access is via the Germansen landing gravel logging road that heads north from town. A generally recent Rainbow road forestry access road turns east and branches to the north and east, accessing new cut blocks and recent fires in the mid-late 1990's. New roads have been constructed since the last recorded exploration work on the property that access higher elevations in the western, central, northern portions of the property.

The physiography of the property includes being part of the northern boundary of the Fraser river basin, of generally low and wide valleys. North of Ft. St. James, the terrain rises in elevation and low to moderately angled, till covered and locally rocky hills occur in the area of the Max property. The property occurs between 850 to 1370 metres elevation, with minor bedrock occurring near steep angled ridges. Trees include fir, spruce and pine, while groundcover is comprised of thistle, devils club, and other sub-alpine plants occur. Extensive areas of beetle killed trees occur where not already logged.

## 2. Claim Status

The Max property is composed of eleven (10) claims totaling approximately 4,145 hectares that are registered in the name of Anthony James Hewett of Vancouver, B.C. (Figure 2, Table 1).

Table 1 Mineral Tenures

Claim Name	Tenure #	Map #	Expiry Date	Area (ha)				
NEWCOPPER WEST MAX COPPER	530480 532537	093K 093K	August 14, 2010 August 14, 2010	464.44 464.44				
Standard Metals Exploration	Ltd	8/12/2010 Page 4						

MAX COPPER 2	532538	093K	August 14, 2010	464.61
MAX COPPER 3	532540	093K	August 14, 2010	464.78
MAX COPPER 4	532541	093K	August 14, 2010	445.9
MAX COPPER 5	532542	093K	August 14, 2010	371.8
MAX COPPER 6	532543	093K	August 14, 2010	334.6
MAX COPPER 7	532635	093K	August 14, 2010	446.14
MAX COPPER 8	532638	093K	August 14, 2010	222.95
MAX COPPER SOUTH	551895	093K	August 14, 2010	464.93
			-	Total: 4144.6

## 3. History

The first documented work on the property is by Arthur A Halleran, Arthur AD Halleran, and Uwe Schmidt who staked the property in 1986 based on gold in streams draining strong magnetic anomalies. The current Max property covers the "Central" portion of a formerly large group of claims explored between 1986 and 1991.

The following historical summary is modified from McClintock, JA, 1991. "In 1986, the property was optioned to United Pacific Gold Limited who carried out a preliminary program of geological mapping, prospecting, soil sampling and collection of panned concentrated silt samples. This work, documented in a report by Uwe Schmidt (1988), confirmed the presence of anomalous gold in streams draining the magnetic anomalies and widespread propylitic altered andesite flow and pyroclastic rocks. Several small intrusive breccia ranging in composition from diorite to syenite were also noted. Grid soil sampling located areas of anomalous copper-in-soils.

In 1988, further grid and reconnaissance soil sampling was carried out over portions of the MAX claims. Because of limited financial resources, United Pacific Gold Limited were unable to carry out further work programs and in 1990, sold their interest in the property to City Resources (Canada) Limited. Prompted by the encouraging geochemical, geophysical and geological setting of the MAX claims, Rio Algom Exploration Inc. entered into a joint venture agreement with City Resources (Canada) Limited in May 1990. In 1990, subsequent to acquiring the property, Rio Algom conducted an airborne VLF EM and magnetic survey of the entire claim block, an airphoto interpretation of the surficial geology, grid soil sampling and geological mapping of the Central grid area. This work outlined a coincident copper and gold in soil anomaly exceeding 1.0 km by 0.5 km in dimension, and up to 2.5km by 2.0 km (McClintock, 1990). Between May 22 and August 12 1991, a comprehensive program of geological mapping, grid soil sampling and reconnaissance induced polarization surveying was carried out on the MAX property to evaluate numerous high-magnetic anomalies for porphyry-type copper-gold mineralization. Between August 14 and September 1, 1991 a program of detailed rock chip sampling, soil profiling and geological mapping was carried out within the Central Grid area of the MAX Option. This work was designed to determine the cause of a broad zone of anomalous copper and gold in soil found by the 1990 grid soil sampling program. Geological mapping found the Central Grid area to contain small multi-phase alkalic plugs, stocks and dykes intruding Takla Group andesite flows and tuffs. Weak propylitic and carbonate alteration, as well as disseminated pyrite and magnetite, are widespread. Detailed rock chip sampling, in conjunction with profile soil sampling, implies the copper and gold-insoil anomalies are sourced from localized copper and gold bearing shear and vein structures."

Rio Algom did not pursue the Central zone further. Instead, areas north and south of the Central zone (current Max property) were subject to induced polarization and subsequent drilling with no significant values reported. After 1992, no further assessment work in the area is recorded.

In 1995 the B.C. Government conducted a low level airborne magnetic and radiometric survey as a continuation of the 1991 Mt. Milligan area survey. This Inzansa Lake airborne survey identified very large areas of positive magnetic and radiometric anomalies occurring in the area of the Max property that are similar in character to those found at other known porphyry copper-gold deposits and mines in B.C.. During a B.C. Government Regional geological mapping program around 1995, a copper showing (K-2) was located near the western side of the current Max property.

During June and July 2007, exploration performed by Standard Metals Exploration Ltd. consisted of soil and silt geochemical surveys and limited geology mapping. Rock, soil and silt samples returned positive values of gold and copper, along with geochemically positive values of arsenic, cobalt and rhenium (Blann, 2007).

# 4. Regional Geology

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The MAX property is underlain by the Takla Group, comprised generally of lower Late Triassic sediments overlain by volcanic, pyroclastic and epiclastic rocks that are intruded by coeval plutons up to Early Jurassic in age (Figure 3). Takla Group is divided into four informal formations, the Rainbow Creek, Inzana Lake, Witch Lake and Chuchi Lake Formations. The area near the MAX property contains the Inzana Lake and Witch Lake Formations. Augite phyric basalt predominates in the Witch Lake Formation. These volcanic rocks are potassium rich, transitional into alkalic, and are described as shoshonite in composition, a petrologic name given to other similar and highly productive volcanic rocks in B.C. and around the world. Lower greenschist facies metamorphism predominates. Two regional scale northwest trending fault systems are the Pinchi and Manson to the west and east, respectively. These sub-parallel faults moved in a dextral, strike-slip sense and a complex set of conjugate faults trending northeast connected the two major faults (Struik, 1990). Regionally, two phases of folding are recognized. F1 and F2 folding are probably late Triassic to early Jurassic in age, and likely related to docking of the Quesnel Terrane (Nelson, 1991). Regional scale fault zones occur in proximity with the MAX property on the west, east and south sides, respectively.

Regionally, six large scale intrusive bodies occur, and include granite, syenite, monzonite/monzodiorite, diorite, gabbro/monzogabbro, and are multi-phase, having variable texture and composition on a local scale. The variation in potassium feldspar content and nature of porphyritic textures requires sodium cobaltonitrate staining for identification (Nelson, 1991).

These intrusive rocks are part of the coeval Takla intrusive suite, and along with nearby large scale faults, are important in the development of alkaline, copper-gold porphyry hydrothermal systems in the area and throughout B.C.

Magnetite with intrusive and volcanic rocks reaches 15% locally. Chlorite, epidote, bleaching and pyrite are the most common forms of alteration. Calc-silicate hornfels is developed at the contact of feldspar hornblende porphyry dykes and calcareous units. Disseminations and fracture coatings of pyrrhotite, chalcopyrite and arsenopyrite may occur with calc silicate alteration."

# 5. Property Geology

The Inzana Lake and Witch Lake Formations underlie the MAX property. The Inzana Lake Formation (map uTrIL) is comprised of tightly folded grey-green to black siliceous argillite, minor volcanic sandstone, siltstone and minor augite crystal lapilli tuff, sedimentary breccias, heterolithic volcanic agglomerate and rare, small limestone pods. The Inzana Formation is gradationally overlain the Witch Lake Formation (map uTrWL). Refer to Figures 3 and 4.

The Witch Lake Formation is comprised dominantly of augite porphyry flow and pyroclastic rocks, plagioclase porphyry latite, and hornblende plagioclase porphyry. Locally, trachyte breccias occur near the top of the Witch Lake Formation. The Witch Lake Formation is typical of explosive volcanism of intermediate composition and includes flow, hypabyssal intrusion, coarse volcanic breccias, agglomerate, lapilli and crystal tuff and thin bedded subaqueous epiclastic sandstone and siltstone.

At a regional scale, there are four major intrusive phases on the MAX property that are coeval with Takla Group volcanic rocks. These rocks comprise a complex of dominantly monzonite to diorite composition mapped from oldest to youngest as Units 4D, 4A, 3D, 3B, and 3A. Unit 4A and 4D are a coarse grained equigranular diorite/monzodiorite and weakly porphyritic andesite, respectively. Units 3D and 3A are weakly porphyritic latite and equigranular coarse grained monzonite, respectively. Unit 3A is found at Mount Milligan and on the MAX property. Abundant magnetite is notable at both locations. Unit 3B is a key to porphyry copper-gold deposits in the area (Nelson, 1991) and is the host for the MBX and Southern Star deposits at Mount Milligan; this unit is also present on the MAX property. Unit 3D occurs mainly as dikes and occur on the western fringe of the Mount Milligan deposit and on the MAX property. They may be feeders to the Witch Lake and Chuchi Lake volcanic flows. Unit 4A occurs on Mount Milligan and on the MAX property.

Hornblendite and aplite dikes have also been noted on the MAX property. In one locality, hornblendite apparently grades into amygdaloidal extrusive equivalents. Similar hornblendite dikes have been documented on the Tas/Fran property to the west.



Photo 3 Volcanic sediments 5% py Photo 4 Strong epidote alteration Photo 5 Strong epidote veins, 2% py trace cp

The MAX property is underlain to the east by volcanic sediments of the Inzana Lake Formation and Witch Lake, a central complex of intrusive rocks described above, and Witch Lake Formation on the western side. Locally, sediments dip moderately to the northeast as shown in photo 3.





Photo 6 Quartz Carbonate vein, up to 4.78% copper Photo 7 Epidote altered clasts in volcanic breccia

Multiple magmatic phases during regional strike-slip and conjugate shear and fault systems confer locally complex structural configurations within intrusive and overlying volcanic and sedimentary rocks. VLF-EM conductors, and mapped fracture and shear zones suggest dominantly northwest to northeast and locally east-west trending structures occur.

The region is underlain by sedimentary and volcanic rocks of the Upper Triassic to Lower Jurassic Takla Group within the Quesnellia Terrane. The group comprises the informally named Inzana Lake, Rainbow, Witch Lake and Chuchi Lake formations. These have been intruded by alkaline intrusives believed to be coeval with the volcanics. The Witch Lake Formation is composed predominantly of augite  $\pm$  plagioclase porphyry flows and agglomerates. It is underlain by the younger Inzana Lake Formation (epiclastic volcanic

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sediments) and the older Rainbow Formation made up of fine grained sediments derived (in part) from a continental source. Amygdaloidal maroon and green subaerial flows and lahars of the Chuchi Lake Formation overlie the Witch Lake Formation. The claims cover an extensive area of propylitic alteration and sporadic mineralization associated with a polyphase intrusive body. The location coordinates are at the highest elevation on the claims, which is the approximate center of the alteration and the area containing several showings in and around the main intrusive body. The complex intrusive suite includes texturally variable diorite and monzodiorite containing hornblende, plagioclase, augite and more rarely potassium feldspar. Hornblendite and aplite dikes have also been noted on the property. In one locality, hornblendite apparently grades into amygdaloidal extrusive equivalents. Similar hornblendite dikes have been documented on the Tas property. The intrusions cut variable heterolithic augite ± plagioclase porphyry flows and agglomerates, black siliceous argillite and volcanic siltstones and sandstones of the Witch Lake Formation. Propylitic alteration is extensive in the intrusive rocks; epidote and secondary chlorite are abundant. Minor potassic alteration also occurs. The sediments are intensely hornfelsed and display abundant secondary biotite whereas abundant epidote is present in the volcanic rocks. Significant magnetite, up to 20 per cent pyrite, 3 per cent average sulphide content, chalcopyrite, hematite and malachite have been noted in the intrusive rocks. Up to 30 per cent pyrite occurs in the Takla Group rocks. Minor disseminated pyrrhotite is found with chlorite in veinlets. The Rainbow Road West showing contained pyrite, chalcopyrite and fluorite in narrow quartz stringers. A chip sample of diorite containing minor sulphides assayed 0.28 per cent copper and minor gold and arsenic (Property File – United Pacific Gold Limited Prospectus Aug. 1988).

## 6. 2010 Work

The 2010 exploration program was comprised of a detailed professional evaluation by Dr. Robert Shives, P.Geo, on the Airborne Radiometric and Magnetic surveys over the property that is included in the Appendix 1. To facilitate the interpretation and recommendations by Dr. Robert Shives, historical soil, silt and rock geochemical data for gold and copper were manually entered into computer and locations converted to NAD83 UTM coordinates and are provided in Figures 5 and 6.

# 7. Discussion

The Max property is located approximately 14 kilometres east of the Tas gold prospect, and 22 kilometres south of Mount Milligan copper gold deposit. The property is underlain by basaltic andesite volcanic flow, breccia heterolithic crystal tuff, and fine grained cherty volcanic sediments that are cut by dikes, sills and a small stock of gabbro, diorite and monzodiorite composition. Subcrop and float boulders of monzodiorite or quartz monzonite also occur. Magnetite and pyrite-pyrrhotite with intrusive and volcanic rocks reaches 15% and 30%, respectively. The volcanic rocks are hornfelsed, biotite and pyroxene and variably chlorite-epidote, quartz sericite carbonate altered. Locally sub rounded clasts of nearly solid pyroxene, epidote and garnet and quartz occur with the volcanic breccia. Strong hornfels and introduction of pyrrhotite, pyrite, trace chalcopyrite, and locally arsenopyrite and sphalerite occur two kilometres beyond the intrusive contact. Large areas of the lower elevations of the property are covered with thick glacial till. Structurally controlled zones of mineralization occur within volcanic and intrusive rocks.

The presence of visible gold flakes and anomalous copper, gold values in stream sediments are significant. The soil and silt sampling in the northeast portion of the Max property has identified elevated and anomalous copper and gold in soils over a distance of approximately 600 metres. In this area, volcanic sediments and volcanic breccia occurs that is moderate to strongly hornfelsed, chlorite epidote and quartz sericite carbonate altered and contains approximately 1-5% pyrite.

The geology, structure, presence of large scale hornfels, calc silicate-pyroxene alteration and pyrite-pyrrhotite, trace chalcopyrite occurs over an area approximately 5 X 5 kilometres ion dimension suggest a large scale copper, gold mineralized magmatic-hydrothermal system occurs on the Max property.

Dr. Robert Shives has recommended further evaluation of several priority targets on the property and suggested a methodology that would provide additional help in locating coppergold mineralization.

## 8. Conclusions

The Max property is located approximately 57 kilometres north of Ft. St. James in northcentral British Columbia, and approximately 14 kilometres east of the Tas gold prospect, and 22 kilometres south of the Mount Milligan copper gold deposit.

On the Max property, outcrops occur predominantly along the higher elevations and steep sided ridges. The property is underlain by Upper Triassic Lower Jurassic volcanic and sedimentary rocks of the Takla Group, and locally, Witch Lake and Inzana Formations. These are the host rocks to the Mt Milligan and Tas copper-gold prospects. In these areas, multiple intrusions of dikes, sills and small plugs occur and are gabbro-diorite, monzodiorite in composition, and possibly more felsic rocks also occur. Intrusive rocks have imparted a strong hornfels in the volcanic and sedimentary rocks, and strong and widespread pervasive and fracture controlled pyroxene, biotite hornfels, chlorite-epidote, sericite, carbonate alteration contains trace to locally 5% or more pyrite, pyrrhotite, magnetite and trace to 1% chalcopyrite locally. Calc-silicate to propylitic style alteration and pyrite occurs over an area approximately 5 km by 5km in dimension. Several narrow shear zones at the K2 prospect contain strong sulphides of pyrite and chalcopyrite, and returned up to 7156 ppm (0.71%) copper and 40840 ppb (40.8 g/t) silver.

Silt and soil sampling of the Max property has identified visible gold in pan concentrates that returned up to 2725.8 (2.7 g/t) gold. A soil grid covering low relief areas west of the Max prospect in the area of the soil grid returned erratic values up to 580.3 ppb gold. Streams draining the northeast side of the Max prospect returned more consistent copper and gold anomalies of up to 98.1 ppm copper, 475.1 ppb gold that together with the large area of alteration and mineralization that occurs, are felt to be of significance for porphyry copper exploration. In this area a reconnaissance soil geochemistry line returned anomalous copper and gold in soils over a distance of approximately 600 metres. This area lies beyond any previously documented exploration and occurs within positive anomalies of an airborne radiometric and magnetic survey.

The occurrence of significant gold and copper values in silt and soil, the widespread presence of alteration and pyrite within volcanic, volcanic-sedimentary, and multi-stage, alkalic intrusive rocks are encouraging and consistent with bulk tonnage alkalic porphyry or a skarn copper-

gold geological setting. Standard Metals Exploration Ltd

A detailed professional analysis of the airborne radiometric and magnetic surveys by Dr. Robert Shives (Appendix 1) has resulted in the identification of several priority target areas worthy of further exploration.

# 9. Recommendations and Budget

Exploration to date on the Max property has identified a large-scale gold and copper bearing magmatic-hydrothermal system that may be affiliated with an alkalic porphyry or skarn deposit. Further exploration is warranted to delimit the new geochemical anomalies and continue to perform property-wide geology and prospecting with a focus on areas identified by Dr. Robert Shives report.

An induced polarization survey over selected areas of favorable airborne radiometric, magnetic geophysical, and soil and silt geochemical surveys is recommended. Positive results from this work would determine diamond drilling locations. Phase 1 \$150, 000

- Fill-in existing soil grid in the Fire Lake zone and extend soil coverage to north and west. Reconnaissance or a few lines of soil sampling in the South Ridge area and continued prospecting and geological mapping the south, west and north sides of the property.
- Cut a total of 20 km of Induced polarization geophysical grid over the 2007 soil grid and Fire Lake zone- northeast and southwest of the creek drainage and over the 1990 coppergold soil anomaly of Rio Algom.

Phase 2: \$400,000

Access road construction and 2,000 metres of diamond drilling.

Respectfully Submitted,

"David Blann"

David E Blann, P.Eng. Standard Metals Exploration Ltd

# 10. Statement of Costs

Wages	# Days	\$/Day	Totals
D. Blann, P.Eng	4	700	\$2,800.00
Dr. Robert Shives, P.Geo			\$5,000.00
Ibex Drafting and GIS			\$1,700.00
			\$9,500.00

Wages and Disbursements \$9,500.00

Total

\$9,500.0

## 11. References

Blann, DE., 2007, Geological and Geochemical report on the MAX-K@ property, Omineca Mining Division, Assessment report event #4159716.

Donaldson, W., 1991, Max Property, Fort St. James British Columbia, Geology and Geochemistry- Central Grid Area, for Rio Algom Exploration Inc. Operator. Assessment Report 21873.

McClintock, JA., 1991, Max Property, Fort St. James British Columbia, Geology, Geochemistry and Geophysics, for Rio Algom Exploration Inc., Operator. Assessment Report 21736.

McClintock, JA., 1990, Max Property, Fort St. James British Columbia, Geology, Geochemistry and Geophysics, for Rio Algom Exploration Inc., Operator. Assessment Report 20530.

Shives, Robert, 2010, Interpretation Report of 1995 Regional Fixed Wing Airborne Gamma Ray Spectrometric/Magnetic Data over the MAX PROPERTY Omineca Mining Division, British Columbia Canada NTS 93K/16E.

# **Statement of Qualifications**

I, David E. Blann, P.Eng., of Squamish, British Columbia, do hereby certify:

That I am a Professional Engineer registered in the Province of British Columbia.

That I am a graduate in Geological Engineering from the Montana College of Mineral Science and Technology, Butte, Montana, 1987.

That I am a graduate in Mining Engineering Technology from the B.C. Institute of Technology, 1984.

That I have been actively engaged in the mining and mineral exploration industry since 1984

Dated in Squamish, B.C., August 12, 2010

"David Blann"

David E Blann, P.Eng.

Appendix 1

Figures



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## **Interpretation Report**

1995 Regional Fixed Wing

Airborne Gamma Ray Spectrometric/Magnetic Data

## over the

## **MAX PROPERTY**

Omineca Mining Division, British Columbia Canada

#### NTS 93K/16E

432000E 608800N NAD83





R. B. K. Shives, P. Geo. Ottawa, July, 2010

Gamma Ray Spectrometry for Exploration

Interpretation Report - 1995 Regional Fixed Wing Airborne Gamma Ray Spectrometric - Magnetic Survey over the MAX PROPERTY, Omineca Mining Division, British Columbia, Canada

#### 1.0 Introduction

Airborne surveys provide a means for remotely sensing geophysical and geochemical properties of geological materials located on or below the earth's surface. Most commonly, these surveys measure magnetic, electromagnetic and radioactive characteristics of bedrock and overburden cover. Where these properties vary in response to bedrock geology, alteration or potentially economic mineralization, the surveys can provide mineral exploration guidance.

In 1993 the Geological Survey of Canada's (GSC) Airborne Radiation Section conducted a fixed wing geophysical survey (Shives et al, 1995) of the Inzana-Salmon Lakes area, British Columbia. The survey included large-volume (50 litres) high sensitivity gamma ray spectrometric and total field magnetic sensors and was conducted largely based on the success of a similar GSC survey (Shives et al, 1993) flown in 1991 over the Mount Milligan Deposit and surrounding area, north of the Max Property. Since then, dozens of radiometric/magnetic surveys have been flown throughout British Columbia and Yukon Territory over alkalic porphyry copper-gold +/- silver +/- molybdenum deposits and their epithermal equivalents.

These surveys have generated numerous case histories documenting successful detection of related potassic alteration, magnetic mineralizing intrusive phases, or magnetite-destructive processes associated with economic grades and mineable deposits. The author has published numerous scientific papers, given hundreds of poster or formal presentations demonstrating field-supported results at several BC locations including Mount Milligan, Mount Polley (several deposits), Kemess South, Afton, Ajax (and many other Afton-camp occurrences or prospects), Prosperity, Lorraine, in Yukon at Casino, Minto, and elsewhere at dozens of other mines or prospects. More locally relative to the Max Property, examples include zones at the Fran/Tas prospect located 14 km to the west. Despite thick overburden cover in some areas, new discoveries of blind porphyry-Cu-Au-bearing intrusions have been made using the combined magnetic and radiometric data, including a discovery in the Phillips Lakes area southeast of Mount Milligan, only a few tens of km from the Max Property.

The purpose of this brief interpretive report is to document, describe and interpret the regional 1993 airborne spectrometric and magnetic patterns over the Max Property, as they relate to existing ground geological and geochemical information provided to the author by D.E. Blann, Standard Metals Exploration Ltd. Targets are selected for ground follow-up, crudely prioritized and recommendations are provided.

Additional background information, exploration history, geology, mineralization descriptions, ground survey descriptions and other information are provided in a report entitled "NI43-101 Summary Report on the Max Property, Omineca Mining Division, Mount Milligan Area, Feb. 2010." by D.E. Blann.

Numerous images accompany this report and have been placed into an Appendix.

#### 2.0 Summary of Property Geology

To support discussion of the airborne results, descriptions of bedrock geology, mineralization and work completed on the property have been summarized below, from the NI43-101 report referred to above, by D.E. Bann.

#### 2.1 Bedrock Geology

The Max property is underlain by Inzana Lake and Witch Lake Formations of the Early Jurassic Takla Group. The Inzana Lake Formation is predominantly sedimentary, comprising tightly folded argillite, volcanic sandstone, siltstone, augite crystal lapilli tuff, sedimentary breccias, heterolithic volcanic agglomerate and rare limestone pods. Witch Lake rocks are mainly volcanic, with augite porphyry flows and pyroclastics, plagioclase porphyry latite, hornblende plagioclase porphyry and trachyte breccias, all of intermediate composition.

Coeval intrusive phases include monzonitic to dioritic compositions and range from coarse grained to weakly porphyritic. The youngest phases on the Max Property are recognized at Mount Milligan as hosts to economic mineralization within the MBX and Southern Star deposits.

The potassic nature of these shoshonitic-composition rocks must be considered when interpreting the airborne gamma ray spectrometric data. Although they generally produce anomalous K patterns relative to less (inherently) potassic rocks, we can distinguish those responses from the more interesting potassium related to hydrothermal alteration related to mineralization by comparing the K to thorium values (eTh/K ratio) or uranium values (eU/K ratio). This is discussed in more detail below.

#### 2.2 Mineralization and Alteration

A paucity of outcrops at Max, especially at lower elevations, does not necessarily prohibit practical application of the gamma ray method, which relies on the radioactive signals emanating from the top 30 cm of the earth's surface (see below). Examples have been found throughout Canada where glacial dispersion or other mechanical processes bring underlying bedrock material to the surface, where they contribute a "bedrock signal" to the resulting, measured patterns. New discoveries of blind deposits have been made on this basis, including the Phillips Lake porphyry-Cu-Au discovery mentioned above, the Allan Lake Carbonatite in Ontario, and others. In many cases the dispersive processes actually increase the size of the anomalous overburden signature, relative to the size of the underlying bedrock source, presenting a larger exploration target.

Where the overburden is truly exotic relative to the local bedrock-derived tills, such as extensive clay cover or aeolian sand (loess, sand dunes) cover, detection of bedrock components in the near-surface material is unlikely.

Biotite alteration associated with thermal metamorphism or hornfelsing occurs throughout the Max Property. Pyroxene, calc-silicate, chlorite-epidote-carbonate (propylitic) and K-feldspar (potassic) alteration are all related to intrusive stock emplacement and/or hydrothermal alteration associated with noted sulphide mineralization (pyrite, pyrrhotite, chalcopyrite, sphalerite, galena, magnetite, hematite and possibly tetrahedrite). Geochemical anomalies in arsenic and cobalt have also been noted and these may serve as pathfinder elements to copper-gold concentrations, based on those relationships established commonly, elsewhere.

Although the metamorphic biotite may generate potassium anomalies at Max, experience has shown (at the very large Sullivan base metal deposits, for example) that superimposed local K alteration can sufficiently increase the radioactive element signatures to provide exploration focus within the broader biotitic zone. This concept applies independently of the mineralogical form of the K-bearing minerals involved, whether *K-feldspar* (the most common K species throughout the Quesnel Trough alkalic porphyry deposits), *sericite* (often related to epithermal equivalents, and is noted at the Rainbow shear-hosted copper showing located just 100 meters north of the Property), *microcline* (as at Hemlo gold deposits in Ontario), *illite* (at Cape Spencer gold mine in southern New Brunswick, and commonly elsewhere) or other forms.

#### 3.0 Airborne Geophysical Survey

The airborne survey was flown by the Geological Survey of Canada in the early stages of an ongoing Program initiated by the author in 1989, while with the GSC's Airborne Geophysics Section in Ottawa. A large volume, 50 liter array of sodium iodide detector was linked to a GSC-built spectrometer, calibrated to international and national standards developed by the GSC to permit determination of ground concentrations of Total Radioactivity (Exposure Rate, uR/h), Potassium (K %), equivalent Uranium (eU ppm) and equivalent Thorium (eTh). Subsequent processing produced the related radioactive element ratios, eU/eTh, eU/K and eTh/K.

East-west oriented flight lines were spaced at 500 meter intervals. The GSC-owned Skyvan aircraft was flown at a nominal terrain clearance of 120 meters at approximately 190 kilometers per hour and all measurements were taken every 1 second, or roughly a reading every 50 meters over the ground. As the primary purpose of the survey was to collect quantitative gamma ray spectrometric data, no magnetic control lines were flown and no magnetic base station was utilized. This approach was used throughout Canada for decades with no practical degradation of the related magnetic data from an exploration viewpoint.

#### 4.0 Airborne Survey Interpretation

To support interpretation of the airborne survey a geographically registered, multi-layered database was created by the author using CorelDraw X4, incorporating georeferenced images of airborne gridded layers as supplied by D.E. Blann. These were combined with very generalized geological information provided on MapPlace.

Map views of the airborne data are derived by gridding data collected along each flight line, to interpolate values for 50 m grid cells lying between the 500 m flight lines. While necessary to create useful maps, this inherently smoothes the data along and between the flight lines. To view the data with maximum resolution it is best to use the original flight line data for each parameter. Stacking several parameters on a single flight line profile provides a means to view all data layers on a single profile, to better display interrelationships. This was done by the author using SurView to display 11 parameters for all 14 flight line segments which cross the Max Property. Of these 11 parameters, 3 are considered essential for this interpretation (K, eTh/K and magnetic total field) and have been exported as .png (Portable Network Graphic) files, included in the Appendix as "stacked profile plots".

#### 4.1 Aeromagnetic Data

The gridded cell values for Magnetic Total Field results over the Max Property range from a low of 57,368 nanoteslas (nT) to a high of 59,168 nT. The magnetic high located just off the southwest corner of the claims reaches a maximum grid value of 60,152 nT. Magnetic patterns are dominated by a circular high centered at 432800 E, 6086400 N, related to a magnetic phase within the broader monzo-dioritic complex mapped regionally. Property scale mapping in that area shows several volcanic zones between intrusive outcrops, suggesting relatively thin volcanic septa or rafts occur, perhaps near the top of the intrusion. Moderate intensity values extend to the south and southwest from this high, joining with the higher amplitude anomaly to the southwest of the property, suggesting the two highs are related, forming part of the same intrusive complex.

A northwest-elongated moderate intensity magnetic total field high occurs in the northwest corner of the claim group, extending from the Goldpan Creek showing. Regional mapping suggests this feature overlies Witch Lake Formation rocks.

A strong magnetic low centered at 433800 E, 88300 N most probably represents a dipole effect related to the main magnetic high. The effect is best viewed on the stacked profile for flight lines 43 and 44.

Linear features within the data may support interpretation of structural breaks or contacts, but the coarse line spacing prevents reliable application without additional geological control. Higher resolution magnetic data from previously flown surveys and ground surveys, will prove more useful.

The magnetic patterns show only a crude spatial correlation with anomalous silt and soil geochemical Au and Cu anomalies: the geochemical values cluster around the flanks of the central magnetic high. A slightly better correlation is noted between bedrock Au and Cu values with the magnetic high flanks.

The magnetic patterns offer direct guides to magnetic phases and hornfelsed aureoles surround the intrusions, but it is in combination with the gamma ray spectrometric data that they provide valuable exploration assistance, as discussed below.

#### 4.2 Airborne Gamma Ray Spectrometric Survey Results

Full interpretation of the gamma ray spectrometric data requires examination of all airborne data layers in both map and stacked profile form, combined with all other available layers. The airborne spectrometric technique provides estimates of the concentrations of K, U and Th determined using gamma ray radioactivity which emanates naturally from the top 30 cm of the earth's surface. Unlike magnetic and electromagnetic (potential field) measurements, there is no significant depth penetration. Radiometric responses are directly affected by soil and surface moisture variations such that swampy, low ground, lakes, snow or ice attenuate the signal, resulting in lowered responses in all three measured radioactive elements. To reduce or eliminate effects due to topographic variations, soil moisture and several other factors, radioactive element <u>ratios</u> can be used to detect important <u>relative</u> variations between the elements, to aid bedrock mapping and detection of alteration.

The at-surface <u>geochemical</u> (K, U and Th) nature of airborne gamma ray spectrometry means that radioactive element patterns <u>must</u> be interpreted in relation to the geology (bedrock or overburden) <u>on</u> the earth's surface. For this reason, correlation with conventional bedrock and soil geochemistry can be more direct than the deeper-sensing magnetic/electromagnetic methods, which require rock property information to constrain interpretation. On the Max Property, higher elevations have less vegetation and thin to no soil cover, locally exposing bedrock. This causes an increase in the measured total radioactivity and the values for all three radioactive elements. This exposure effect can be seen on both map and profile views of the data and must be considered during interpretation. A similar but generally less intense effect occurs over clear-cuts, where the removal of trees and related reduction in soil moisture tends to increase the overall measured radioactivity. Again, the use of ratios can minimize these effects, allowing detection of subtle relative enrichment or depletion of one or more radioactive elements.

As the spectrometric method determines U and Th concentrations based on measurements of daughter isotopes (Bi-214 and TI-208, respectively) assumed to be in equilibrium with their parent isotopes (Bi-214 and Th-232, respectively) we refer to the concentrations as "equivalent", symbolized as "eU" and "eTh".

#### 4.2.1 Airborne Potassium (K) map

The Max Property overlies an irregularly shaped, regional potassium high with several areas exceeding 1.5 % K gridded cell value, to a maximum of 1.66% K. These areas overlie topographic highs, where thin cover, possibly exposed bedrock, and drier, better drained soil cover occurs. As these factors influence the absolute value of all three radioactive elements measured, it is more useful to apply element ratios, as discussed above.

The potassium anomaly generally over lies the central magnetic high associated with the intrusive complex, but extends off the magnetic anomaly, to the north. This may reflect either non-magnetic intrusion north of the magnetic anomaly, or potassic Takla rocks, or possible hydrothermal alteration of either intrusive or volcanic rocks in that area. There is very good correlation between rock, soil and stream silt Cu and Au anomalies and the potassium highs. The three known showings (Rainbow, Goldpan, K2) lie along the edges of the potassium anomlies, but not in the areas with highest K values. Again, this may be a reflection of the outcrop exposure variation.

#### 4.2.2 Airborne equivalent Uranium (eU) map

The gridded uranium map appears noisy, with very low eU values ranging from less than 0.1 ppm eU to 1.3 ppm eU. No obvious patterns relating to bedrock geology or alteration are recognized.

## 4.2.3 Airborne equivalent Thorium (eTh) map

Gridded thorium values are also quite low, ranging from 0.89 ppm eTh to 2.63 ppm eTh. Lack of detailed bedrock geological information makes it difficult to use the thorium patterns as a mapping guide, but areas with higher values may reflect the presence of more felsic units (intrusive or extrusive) rather than mafic rocks with lower eTh values. Hydrothermal alteration associated with the alkalic Quesnel Trough porphyries generally does not significantly affect the thorium values of the host rocks.

#### 4.2.4 Airborne eU/eTh, eU/K and eTh/K ratio maps

During normal magmatic differentiation, the radioactive elements all increase with increasing evolution of the melt, keeping the ratios at a constant value (for example, for eU/eTh 0.25 is the crustal average). Late or post-magmatic processes commonly cause relative enrichment or depletion of one or more of the radioactive elements during related mineralizing events. In these cases, the radioactive element ratios can serve as trace element "pathfinders", providing exploration vectors towards metals of interest.

Understandably, given the very low eU and eTh values over the property, the resulting eU/eTh ratio also appears noisy, with no obviously useful patterns. Values range from 0.08 to 0.83. The eU/K ratio on the other hand, reflects the influence of potassium enrichment (relative to the uranium). This is interpreted as a reflection of hydrothermal alteration (K-feldspar or sericite is reported) superimposed on the regional or thermal biotitic aureole effects. Values for eU/K range

from 0.14 to 1.4. However, the inherently noisy nature of the uranium data affects the eU/K patterns.

Improved counting statistics associated with thorium determined gamma ray spectrometrically (relative to low-counts associated with uranium) produces less noisy eTh data. As a result the eTh/K ratio provides the best indicator of relative K enrichment. The chemical stability of thorium provides useful indication of pre-alteration lithologic signatures, where sufficient contrasts occur between bedrock units. On the Max Property, eTh/K ratio values range from 0.62 to 3.0 and produce strong anomalies (low ratios). The role of these encouraging eTh/K patterns is discussed further below.

## 4.2.5 Airborne ternary radioactive element (K-eU-eTh) map

A radioactive element ternary map displays the relative proportions of all three radioactive elements in an RGB [red (K) – green (eTh) – blue (eU)] or CMY [cyan (eU) – magenta (K) – yellow (eTh)] colour space. Ideally, the intensity of the resulting hue is modulated by total radioactivity value, such that low-count (less statistically reliable) areas appear in faded pastel colours, and high-count areas produce intense colours. The ternary image shown in this report is taken from the regional CMY image provided by the GSC.

Although strong potassium dominance is indicated by intense magenta hues, the colour variations over the Max Property are broad, offering little guidance to focus <u>within</u> the property. Green hues indicate local areas where unconsolidated sediments (till, glaciofluvial or lacustrine deposits) may overlie and effectively mask the local bedrock radioactive element signatures. Areas of swampy, wet ground appear as faint pastel colours related to low total counts.

## 4.2.6 Stacked radioactive element profiles

Thirteen of the regional airborne survey flight lines cross the Max Property. These include flight lines 35 through 47. Stacked profiles for these flight lines were viewed in detail by the author and a series of images depicting the K, eTh/K and magnetic total field profiles are provided.

Detailed examination of both the colour gridded maps and the detailed stacked profiles provides the basis for evaluation of potential Targets within ther Max Property. These are summarized in the Table shown below.

Target	Flight Line	Fiducial	E	N	к	eTh/K	MAG	Stacked Profile	Score	Crude Priority
A	36	830	432570	6084402	2	1	3	4	10	
В	37	362	432226	6084896	3	1	3	4	11	8
С	38	810	431318	6085494	2	2	2	3	9	
D	39	410	430691	6085958	2	1	2	5	10	7
E	39	370	433014	6085987	2	1	4	4	11	5
F	40	818	432136	6086483	3	1	4	5	13	3
G	41	340	432652	6086976	4	3	4	5	16	1
н	42	778	433287	6087484	2	3	2	5	12	4
I	43	346	432704	6088000	4	3	2	5	14	2
J	44	770	433950	6088575	4	2	1	5	12	6
К	45	342	433562	6088945	3	2	1	4	10	
L	46	683	429364	6089593	2	1	2	4	9	
М	47	364	432261	6089940	2	1	2	5	10	

Targets have been labeled "A" to "M" for reference on the related colour maps. Flight line and fiducial numbers locate the anomalies along each stacked profile. Coordinates are provided, taken from the exact anomaly location using SurView, in NAD83 projection. Numbers under the K, eTh/K and MAG headings are relative scores assigned by the author as follows:

	5	4	3	2	1
К	-	very high	high	medium	low
eTh/K	-	-	very low	low	medium
MAG	-	high	medium	low	very low
Stacked Profile	strong flanking mag with shoulder effect and deep eTh/K low	strong mag, deep eTh/K low	eTh/K low, moderate mag	eTh/K low, weaker mag	eTh/K low over low mag

Stacked profile comments above are based more on subjective "how they look" experience than a rigorous evaluation. The crude priority provided offers guidance as to possible initial focus of field follow-up, but ALL anomalies do have merit.

#### 5.0 Summary, Conclusions, Comments

On the Max Property strong correlation exists between the deep blue and grey eTh/K lows, and the known showings plus all geochemical anomalies in bedrock, soils or silts. This phenomenon is observed at a large number of showings, prospects, and producing mines throughout the Quesnel Trough and even worldwide. However, low eTh/K values alone are not sufficient to define valid exploration targets, as they can result from either: a) relative K increase (desirable); b) relative eTh decrease (uncommon); c) poor counting statistics in low radioactivity areas (common). Throughout the Quesnel Trough, experience has shown that significant improvement in exploration vectoring is achieved through combination of valid eTh/K lows (where moderate to strong K exists) with flanking magnetic highs.

The Max Property anomalies which occur within the regional airborne geophysical data described in this report appear very similar to those associated with the known deposits at Mount Milligan, Afton, Ajax and many other producing or developing deposits. They support the concept that magnetic intrusive phases occur on the property and that those phases or their related non-magnetic phases are associated with subsequent hydrothermal potassic alteration (which may be magnetite destructive, based on the small "breaks" in magnetic flanks).

Clear association of the resulting anomalies with existing copper, gold in bedrock, soils and silts demonstrates the presence of those metals in the system (a hydrothermal system). Specific Targets have been selected and prioritized to provide additional exploration focus on the Property.

#### 6.0 Recommendations

- 1. Detailed evaluation of the existing bedrock mapping, trenching, geochemical and lithogeochemical results (not provided to the author) should be conducted in the proximity of the selected Targets, to improve ranking.
- 2. Prospecting should be conducted in the highest ranked areas first, subject to other work priorities or access issues. This work could include magnetic susceptibility measurements using a small but effective handheld unit such as the KT-10 from Terraplus. To avoid the onerous task of staining rocks to qualitatively determine the potassium content as an indicator of alteration, it is recommended that a small handheld gamma ray spectrometer be used to quantify the K, eU and eTh concentrations in bedrock. The RS230-BGO model made by Radiation Solutions Inc. is highly recommended, easy to use, and also available for rent from Terraplus.
- 3. Bedrock sampling should be conducted where mineralization is observed, as is normal practice.

4. MMI or other proprietary selective leach methods could be conducted as follow-up to selected targets. The author has recently conducted successful surveys over porphyry-related deposits elsewhere in the Trough.

Respectfully submitted July 1,2010

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Gamma Ray Spectrometry for Exploration



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# APPENDIX

# Various map views of the airborne data and related Stacked Profile plots





Interpretation of 1995 Regional Fixed Wing Airborne Gamma Ray Spectrometric/Magnetic Data MAX PROPERTY Omineca Mining Division, British Columbia









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