

MAYO LAKE MINERALS INC.  
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# Assessment Report

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On the

## Carlin Claim Group

GR various, ML2 1-ML2 126, MLC 1-MLC 16,

Describing an

## Airborne Geophysical Survey

105M 14/15

Latitude 63.8234N, Longitude 134.8256E

In the

Mayo Mining District  
Yukon Territory

By

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## Introduction

The Carlin Claim Group (the “Property”), composed of 217 claims owned by Mayo Lake Minerals Inc., and 16 claims owned by Karl Ziehe and Mark Fekete, is located 75km northeast of Mayo (**Figure 1**) to the east of the Keno Hill District, which produced over 200 million ounces of silver from veins cutting Mississippian quartzite and schist. The Property lies in the northeastern portion of the Tintina Gold Belt, a loosely defined 2100 km long zone of gold and silver deposits extending across central Alaska and Yukon. Nearby deposits include Dublin Gulch (6.4Moz Au), Keno Hill (242Moz Ag), Red Mountain (1.3Moz Au) and Marge (Au, Ag, Cu, Pb, and Zn).

This report outlines the survey operations, data processing activities and initial interpretation related to an airborne geophysical survey flown between March 5, 2012 and March 13, 2012 over the Property. The airborne geophysical survey, which was flown by Precision GeoSurveys Inc. for Mayo Lake Minerals Inc., resulted in the acquisition of high resolution magnetic data.

## Location and Access

The Property consists of 233 contiguous claims located approximately 75 kilometers northeast of Mayo, Yukon, Canada and spans NTS map sheets 105M 14/15. The claims are registered in the Mayo Mining district under the name of Mayo Lake Minerals Inc. except for claims preceded by MLC which are registered under the names Karl Ziehe and Mark Fekete. The claims are listed in **Table 1** below with the location of the claims shown in **Figure 1 & Figure 2**.

Grant number	Claim Name	Map sheet	Group Name
YE46162-YE46163	GR162-GR163	105M 14/15	Carlin
YE46186-YE46196	GR186-GR196	105M 14/15	Carlin
YE24715-YE24734	GR215-GR234	105M 14/15	Carlin
YE24751-YE24776	GR251-GR276	105M 14/15	Carlin
YD06686-YD06703	GR346-GR363	105M 14/15	Carlin
YD72664-YD72670	GR364-GR370	105M 14/15	Carlin
YD29091-YD29097	GR371-GR377	105M 14/15	Carlin
YE25401-YE25500	ML2 1-ML2 100	105M 14/15	Carlin
YD63901	ML2 101	105M 14/15	Carlin
YD90482	ML2 102	105M 14/15	Carlin
YD95643	ML2 103	105M 14/15	Carlin
YD14144	ML2 104	105M 14/15	Carlin
YD12565	ML2 105	105M 14/15	Carlin
YD65696-YD65697	ML2 106 -ML2 107	105M 14/15	Carlin
YD63808-YD63810	ML2 108-ML2 110	105M 14/15	Carlin
YD62111	ML2 111	105M 14/15	Carlin
YE31592	ML2 112	105M 14/15	Carlin
YD61613	ML2 113	105M 14/15	Carlin

YD62214	ML2 114	105M 14/15	Carlin
YD63815	ML2 115	105M 14/15	Carlin
YD63716	ML2 116	105M 14/15	Carlin
YD61617	ML2 117	105M 14/15	Carlin
YD61618	ML2 118	105M 14/15	Carlin
YD15749	ML2 119	105M 14/15	Carlin
YD15750	ML2 120	105M 14/15	Carlin
YD14046	ML2 121	105M 14/15	Carlin
YD14099	ML2 122	105M 14/15	Carlin
YD14289	ML2 123	105M 14/15	Carlin
YD14290	ML2 124	105M 14/15	Carlin
YD14299	ML2 125	105M 14/15	Carlin
YD14300	ML2 126	105M 14/15	Carlin
YE25351-YE25366	MLC1-MLC16	105M 14/15	Carlin

**Table 1** Claims comprising the Carlin Claim Group

Access is by helicopter; though a 4-wheel drive access road runs within 5km of the property and is connected to a government-maintained, gravel road (Silver Trail). The Silver Trail connects with the Yukon's paved or chip-sealed highway network at Mayo (**Figure 1**). Also, it could be accessed by Mayo Lake from the boat launch at the Mayo Lake Dam which is connected by a government-maintained, gravel road (Mayo Lake Road) to the Silver Trail.

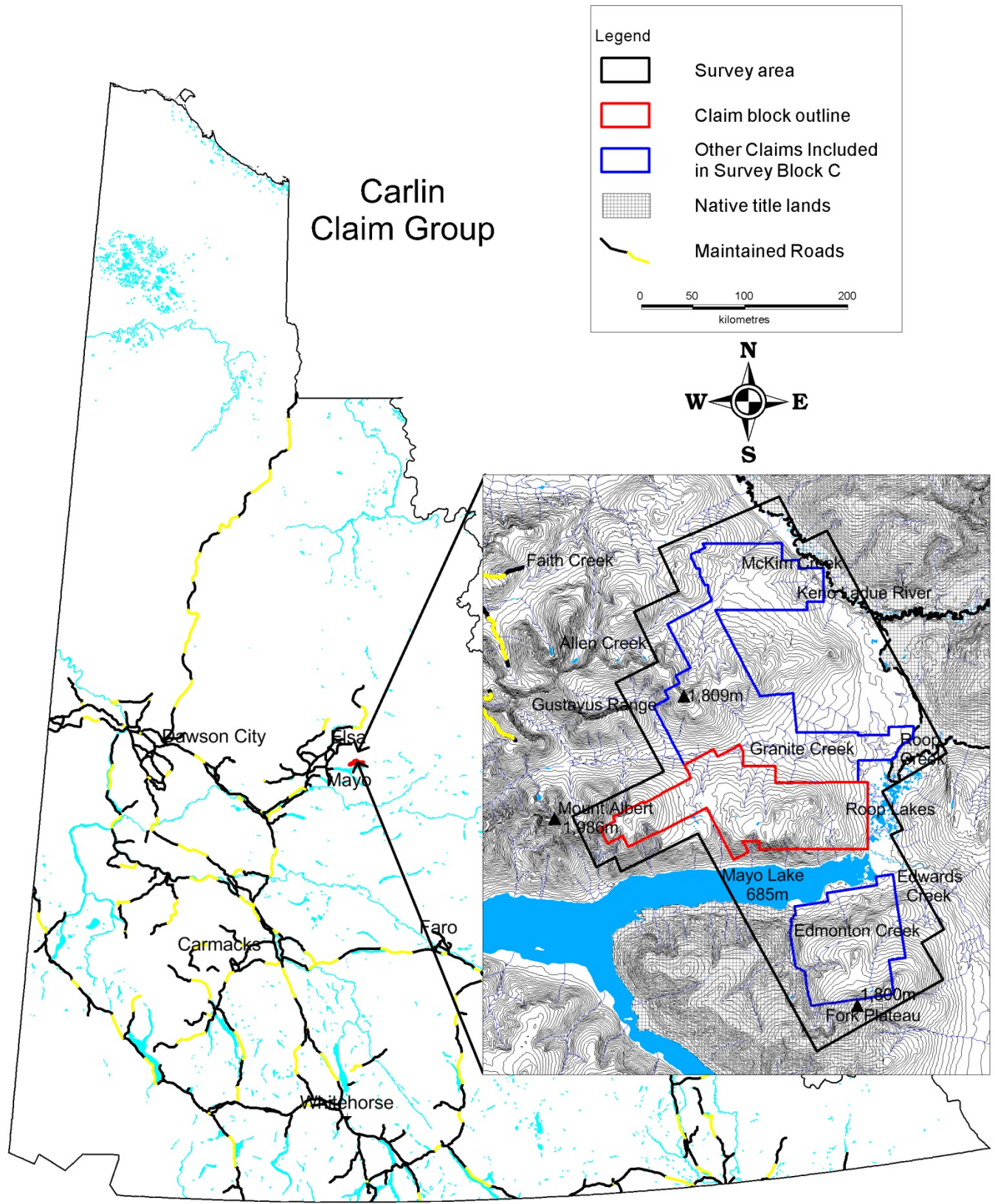


Figure 1 Carlin Property location

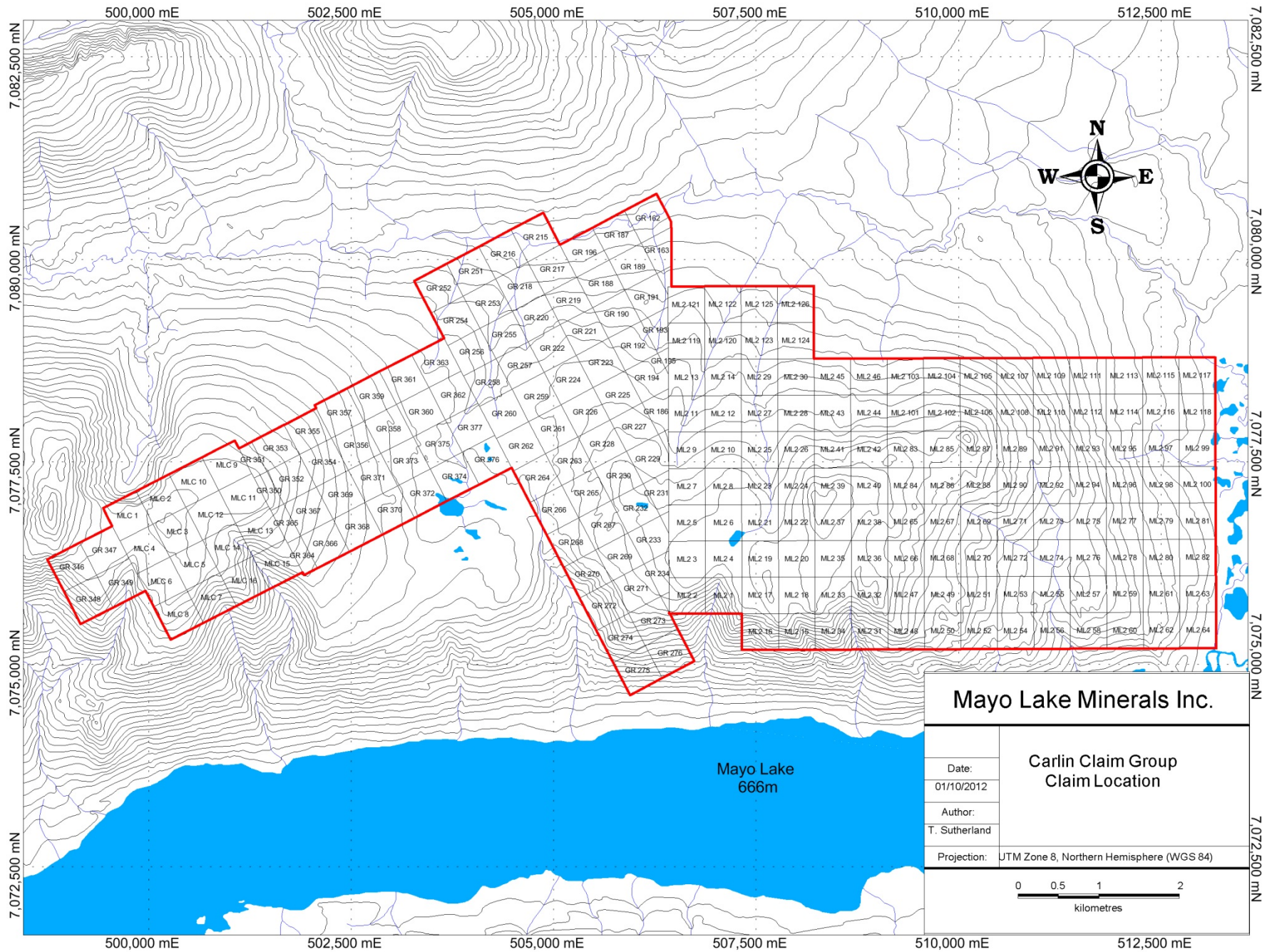


Figure 2 Location of claims in Carlin Block

## Previous Work

The majority of previous work consists of placer mining focused on Granite Creek. Well documented exploration consists of regional government stream sediment sampling programs and a description of a possible de-calcified gold trend.

Lynch, 2006 describes two 4km long occurrences of decalcification; this was interpreted as favorable for Carlin style mineralization. However this survey suffered from a limited sample set that was likely striped of in-situ gold by meteoric waters. This remains a target for later stage drilling to sample material that is located below the water table.

Project Keno Hill headed by Chris Gleeson of the Geologic Survey of Canada was completed in 1968. It covered creeks north of the property with stream sediment, water, and heavy mineral sampling programs (Gleeson et al 1965-1968, Gleeson & Boyle 1972, Gleeson 1980a, Gleeson 1980b). This program was systematic for some elements and indicated the presence of several anomalies in all media, notably; scattered Au, anomalies from streams draining north into Granite Creek and multi-element (Cu, Zn, heavy metals +/- As, B) draining south into Mayo Lake.

## Geomorphology

The Property covers the ridge between Granite Creek and Mayo Lake (**Figure 2**) west of the Roop Lakes. The valley containing the Keno-Ladue River, Granite Creek, and Mayo Lake is broad and U-shaped due to glacier ice being funneled down them from east to west during Pleistocene glaciations. Most tributaries to the large valleys are narrow and confined by moderate to steep slopes. Slopes are generally moderate in the east and steeper to the west closer to the Gustavus Range where there is development of several cirques. Streams draining the property are all part of the Yukon River watershed.

The Property has been subjected to multiple glaciations (Hughes 1982). The youngest Pleistocene McConnell Glaciation was confined to the trunk valleys occupied by Mayo, Janet and Williamson lakes, Keno Ladue River, and Granite Creek (Bond 1999). With the exception of the valley occupied by Granite Creek, these valleys were filled with fast flowing ice that scoured their bottoms and sides. During the McConnell glaciation, ice moved up Granite Creek where it terminated as it moved westward up the slope. The ice was probably cold based and minimal erosion took place. During the earlier Reid glaciation, ice flowed west over the divide to Keystone Creek and was probably more erosional. The upper limit of the McConnell Glaciation is marked by lateral moraines and kame terraces along the sides of these valleys. The uplands forming the central part of the claim group were covered by glacial ice during the older Reid glaciation. Due to the elevation of the upland, the ice was probably cold-based and transport of rock and debris was minimal as is evidenced by landforms.

During deglaciation, the trunk valleys were filled by proglacial outwash in some areas. Subsequently, streams have carved terraces and floodplains into the valley fills. The alluvium is a mixture of gravel, sand, silt and organics, generally fining upward.

Outcrop is sparse on the property, rarely exceeding 5% in any area. Soil development is immature.

Vegetation is predominantly black spruce with willow and alder understorey. Lowlands and north facing slopes exhibit a thick cover of organic matter, moss and Labrador tea. South facing slopes are similarly vegetated but also include balsam and poplar groves. Permafrost is likely pervasive on north facing slopes but discontinuous on south facing slopes.

## **Regional Geology and Mineralization**

Mapping in this region was done by C.F Roots who integrated numerous geological publications dating from 1920 to 1995. His work resulted in a regional map at 1:250,000 scale (Roots 1997).

The Property is located within the Selwyn Basin and lies within the Tintina Gold Belt. Simplified regional geology as shown on **Figure 3** depicts Upper Proterozoic to Lower Cambrian Hyland Group stratigraphy, in contact with Paleozoic metasedimentary units of the Ern Group and Keno Hill Quartzite along the Robert Service Thrust. Mid-Triassic mafic sills and greenstones are common in the Keno Hill Quartzite and Ern Group, but are rarely encountered in other units. All stratigraphic units have been intruded by the Mid-Cretaceous age Tombstone Plutonic Suite, which host several known gold deposits including Dublin Gulch. The 100km<sup>2</sup> Rook Pluton, west of the Keno Hill Camp, is the largest member of the Tombstone Plutonic Suite and probably drove hydrothermal circulation leading to the mineralization at Keno Hill as noted by references cited by Roots (1997).

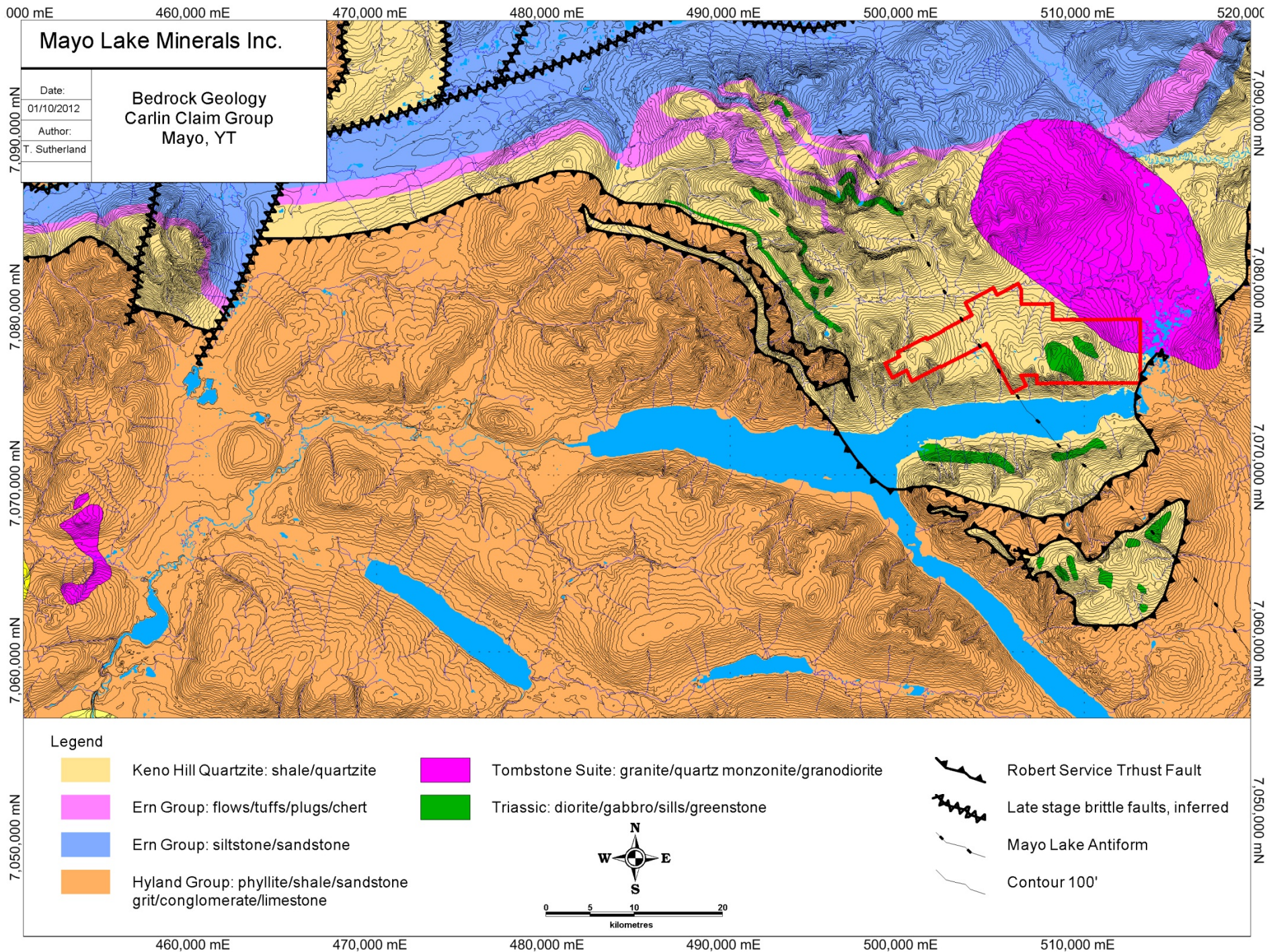
The dominant structural features in the area are a series of imbricated thrust sheets that collectively make up the Robert Service Thrust. These thrusts are commonly difficult to distinguish due to subsequent intense folding of faults and contacts and a strong penetrative structural fabric imparted by the Tombstone Thrust; the area deformed during this event is often referred to as the Tombstone Strain Zone. Intense folding is especially evident in units immediately around Keno Hill. Large open folds, McQueston Antiform (E-W) and Mayo Lake Antiform (NW-SE), and several inferred brittle faults were developed after the large thrusting events (Roots 1997)

Abundant historical work focused in and around Keno Hill led to a separate nomenclature in which the Hyland Group was deemed the Upper Schist and the Ern Group was deemed the Lower Schist (Green 1971). This coincides with early inferences that the Upper Schist (Hyland Group) was younger than the Lower Schist (Ern Group). The term "Keno Hill Quartzite" is well developed in literature, though internal folding and imbrication have prevented the description of a type section or measurement of unit thickness thus far, therefore the formation status of the unit remains informal. Stratigraphically it lies immediately above Ern group. Green, 1971, includes meta-volcanic units in the Keno Hill Quartzite; this is likely the topmost unit of the Ern group (Murphy 1997, Roots 1997) though Roots 1997 includes this as the basal unit of the Keno Hill Quartzite at Keno Hill instead.

The Keno Hill silver camp has produced over two hundred million ounces of silver since 1921. Productive veins occur in the Keno Hill Quartzite and underlying Lower Schist. Although faults with associated mineralization ("mineralized faults") are believed to cut through the Robert Service Thrust and continue into the Hyland Group, no significant silver mineralization has been discovered above the thrust. Ore

shoots within the veins typically consist of galena, sphalerite and tetrahedrite with siderite or quartz gangue. The mineralized faults trend northeast and dip steeply to the southeast with left lateral offsets ranging from a few metres to over a hundred metres (Boyle 1965). Cross faults offsetting the mineralized faults trend perpendicular to them and dip 20° to 30° to the southwest.

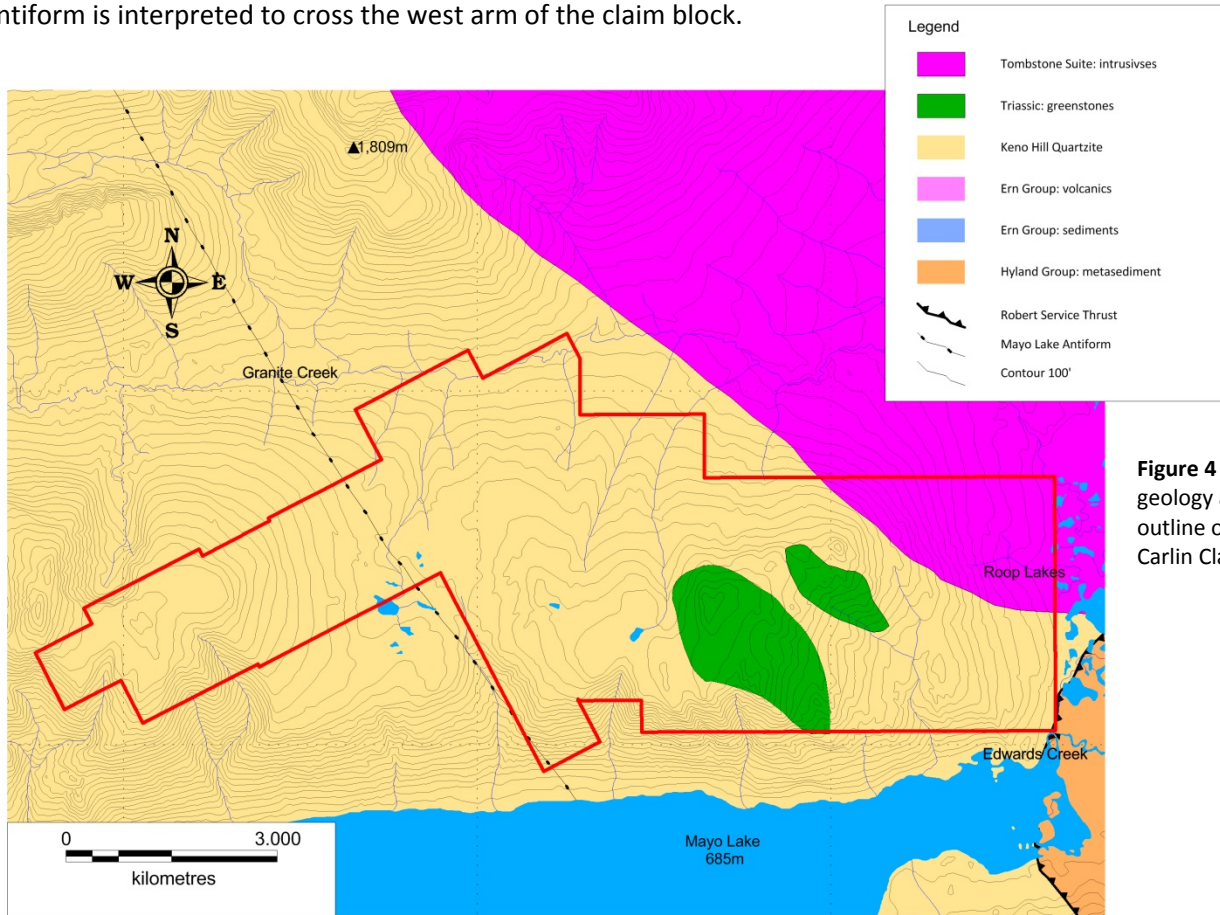
Two major gold occurrences are located within 50 km of the Property. Dublin Gulch is an intrusion of the Tombstone Plutonic Suite hosting high tonnage low grade gold mineralization in sheeted veins primarily in the stock but penetrating short distances into surrounding Hyland Group metasedimentary rocks. The 160km Rau-Nadaleen Trend is a newly discovered belt of Carlin Type mineralization in carbonate sediments of the Bouvette Formation. The most advanced project is Dublin Gulch where a definitive feasibility study has been completed; it hosts an open pit resource containing 6.4 million ounces of gold at a grade of 0.67g/t.



**Figure 3** Regional geology

## Property Geology

The Property's geology is shown on **Figure 4**. The Carlin Property is underlain by Keno Hill Quartzite intruded by Triassic greenstones and the Cretaceous Roop Pluton. A contact metamorphic aureole extends away from the stock up to 4km affecting most units underlying the property. The Mayo Lake Antiform is interpreted to cross the west arm of the claim block.



**Figure 4** Property geology and outline of the Carlin Claim Group

### Stratigraphy

Forming the footwall of the Robert Service Thrust and underlying most of the property is the Keno Hill Quartzite, comprised of massive to well-foliated and lineated quartzite with lesser phyllitic quartzite, chloritic and carbonaceous phyllite and minor limestone and metavolcanic rocks (Green 1971).

### Intrusions

The Keno Hill area is intruded by Cretaceous age dykes, plugs and stocks of the Tombstone Plutonic Suite; of these the 100km<sup>2</sup> Roop Pluton is the largest in the Keno Hill area and underlies the majority of the Property. Two areas near the center of the stock are porphyritic with alkali feldspar phenocrysts up to 2cm. The main body of the stock is composed of medium grained granodiorite and grades into quartz diorite around the periphery. The stock is ringed by a 100m wide zone of aplite and pegmatite dykes. Analysis of government aeromagnetics and the presence of two plugs of biotite quartz monzonite 8km to the south east indicate that the pluton likely extends in that direction at a relatively shallow level.

Triassic metadiorite sills which are present are dark green, foliated, fine to medium grained and weather in a blocky fashion. The main mineral assemblage consists of amphibole, chlorite and plagioclase. Sills are common in the Keno Hill Quartzite and Ern Group.

### **Structure**

Deformation on the property is typical of that seen elsewhere in the Tombstone Strain zone, including a strong penetrative fabric and recumbent folds. The trace of the Mayo Lake Antiform, which trends southeast, lies to the west of the property parallel to the long axis of the Roop Pluton. Any relationship between the intrusion of the Roop Pluton and Mayo Lake Antiform is speculative (Roots 1997).

Consistent deformation and abundant small scale folding could be related to either the intrusion of the Roop Pluton; the formation of the Mayo Lake Antiform; or be further manifestations of the Tombstone Strain Zone.

### **Mineralization**

The Property is a prospective host to, a variety of gold deposit styles related to the complex Mesozoic and Cenozoic metamorphic, plutonic and volcanic history associated with the formation of the northern Canadian Cordilleran orogeny. The most attractive of these are:

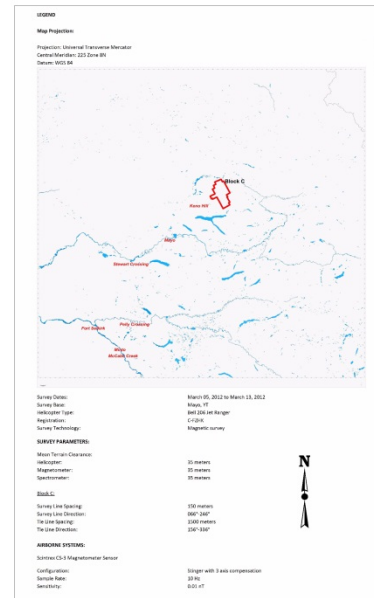
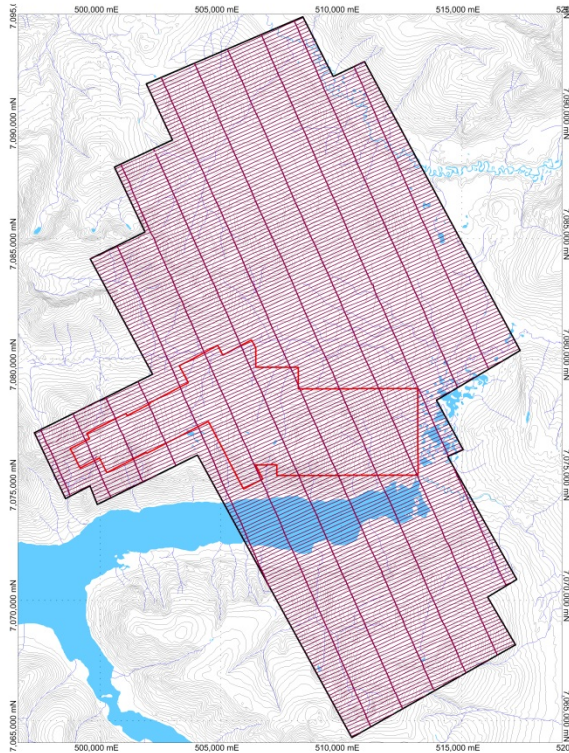
- Polymetallic veins of the Keno Hill Type that are typically high in silver, lead, and zinc and are related to the intrusion of the Tombstone Plutonic Suite.
- Reduced Intrusion Related gold ores related to post-orogenic, mid-Cretaceous plutons that intruded Selwyn Basin sedimentary rocks.
- Orogenic gold veins, Jurassic in age, which formed after peak metamorphism of the Yukon-Tanana Terrane; their erosion likely contributed to the Klondike placer deposits.
- Lynch, 2006 mapped out several kilometers worth of Carlin-like mineralization on the property and concluded that testing of this trend below the water table would be required to get bedrock samples unaffected by meteoric leaching.

There is also good potential to host tungsten skarns similar to the Ray Gulch Tungsten Skarn at Dublin Gulch and a nearby showing southeast of the Roop Pluton.

A study by Lynch 2006, described an altered member of the Keno Hill Quartzite situated 20 km southeast of the Keno Hill mining district on the Property. The unit was traced for 4 km through mapping and sampling and was referred to as the "Sugar Member". Lynch classifies it as a sediment-hosted disseminated gold occurrence, on the basis of the stratabound nature of the alteration and veining, and observed decarbonatization and apparent decalcification. The author goes on to note that characteristics suggest that the hydrothermal activity occurred within the mesothermal regime rather than the more common epithermal regime of well established, sediment-hosted disseminated gold deposits. Although the gold assays returned modest results, the values are distinctly anomalous and evidence suggests gold was remobilization in the porous unit due to meteoric circulation and leaching.

## Geophysics

The Property was flown concurrently with two other claim groups, Edmonton and Carlin, collectively designated Block C for the duration of the survey. The total block is approximately 14 km by 27.5 km, including a buffer zone of ~1km around the outside of the claims to dampen edge effect. The survey area in relation to the claims can be observed on **Figure 1**. A total of 2399 line kilometers of magnetic data were flown for this survey, including tie lines. The survey lines were flown at 150 meter spacings, at a 066°/246° heading; the tie lines were flown at 1500 m spacings, at a heading of 156°/336° (**Figure 5**).



**Mayo Lake Minerals Inc.**

Flight Path Block C



**Figure 5** Flight lines from Precision Geosurveys Inc. The Combined Roop, Carlin and Edmonton properties were designated Block C for the duration of the survey. A larger version of this figure is also included in Appendix C

### Survey Specifications:

The geodetic system used for this survey is WGS 84 and the area is contained in zone 8N. The survey data acquisition specifications and coordinates for Block C are specified in **Tables 2&3**

Survey block	Line Spacing m	Planned Survey Line km	Planned Tie Line km	Total Planned Line km	Total Actual Flown km	Survey Line Orientation	Nominal Survey Height m
C	150	2180	220	2400	2399	066°/246°	35

**Table 2** Block C survey acquisition specifications

Longitude	Latitude	Easting	Northing
134.64568	63.85022	517423	7080372
134.71654	63.83183	513948	7078306
134.69420	63.81337	515057	7076254
134.70729	63.81083	514414	7075968
134.64977	63.76502	517274	7070878
134.67426	63.75849	516070	7070144
134.65097	63.74061	517230	7068157
134.78901	63.70633	510428	7064308
134.91832	63.81169	504022	7076033
135.00260	63.79332	499872	7073984
135.00885	63.80023	499564	7074754
135.02945	63.79544	498549	7074220
135.05578	63.82003	497254	7076961
134.95590	63.84180	502169	7079386
135.00863	63.88473	499576	7084169
134.96236	63.89475	501848	7085287
134.98824	63.91888	500577	7087975
134.93909	63.92903	502987	7089107
134.96129	63.94987	501897	7091429
134.82842	63.97479	508400	7094216
134.80278	63.95249	509663	7091735
134.77628	63.95802	510959	7092356

**Table 3** Mayo Lake Block C survey polygon coordinates using WGS 84 in zone 8N.

**Magnetic Surveying:**

Magnetic surveying is the most common airborne survey to be conducted for both mineral and hydrocarbon exploration. The type of survey specifications, instrumentation, and interpretation procedures, depend on the objectives of the survey. Typically magnetic surveys are performed for:

- Geological Mapping, 1) to aid mapping of lithology, structure and alteration in both hard rock environments, 2) to map basement lithology, structure and alteration in sedimentary basins or 3) regional tectonic studies.
- Depth to Basement mapping for exploration in sedimentary basins or mineralization associated with the basement surface.

**Survey Operations:**

Precision GeoSurveys flew the Property using a Bell 206 BIII Jet Ranger. The survey lines were flown at a nominal line spacing of one hundred and fifty (150) meters and the tie lines were flown at 1500 m spacing for the magnetometer. The average survey elevation was 32 meters vertically above ground for the Block C. The experience of the pilot helped to ensure that the data quality objectives were met and

that the safety of the flight crew was never compromised given the potential risks involved in airborne surveying.

The base of operations for this survey was in Mayo, YT, Canada. The Precision crew consisted of three members:

Ola Vaage - Pilot

Stian Vaage - Operator

Shawn Walker - On-site Geophysicist

The survey was started March 10, 2012 and completed March 15, 2012. The survey encountered several delays due to poor weather conditions and magnetic solar storms.

**Base Station Details:**

Magnetic base stations are set up before every flight to ensure that diurnal activity are recorded during the survey flights. In this case, two base stations were plotted: Gem 4 was located in bush north east of Janet Lake and Gem 5 was located in bush on the south side of Mayo airport (**Table 4**).

Station Name	Easting/Northing	Longitude/Latitude	Datum/ Projection
GEM4	476735E 7061033N	-135.470E 63.676N	8N
GEM5	456420E 7054452N	-135.879E 63.615N	8N

**Table 4** Base station details

Base station readings were reviewed at regular intervals to ensure that no data was collected during periods with high diurnal activity (greater than 5 nT per minute). The base station was installed at a magnetically noise-free area, away from metallic items such as steel objects, vehicles, or power lines. The magnetic variations recorded from the stationary base station are removed from the magnetic data recorded in flight to ensure that the anomalies seen are real and not due to solar activity.

**Equipment:**

For this survey, a magnetometer, base station, laser altimeter, and a data acquisition system were required to carry out the survey and collect quality, high resolution magnetic data. The survey magnetometer is carried in an approved “stinger” configuration to enhance flight safety and improve data quality in this mountainous terrain.

**AGIS:**

The Airborne Geophysical Information System, AGIS, is the main computer used in data recording, data synchronizing, displaying real-time QC data for the geophysical operator, and to generate navigation information for the pilot display system. The AGIS was manufactured by Pico Envirotec; therefore the system uses standardized Pico software and external sensors that are connected to the system via RS-232 serial communication cables. The AGIS data format is easily converted into Geosoft or ASCII file formats by a supplied conversion program called PEIView. Additional Pico software allows for post real time magnetic compensation and survey quality control procedures.

**Magnetometer:**

The magnetometer used by Precision GeoSurveys is a Scintrex cesium vapor CS-3 magnetometer. The system was housed in a front mounted “stinger”. The CS-3 is a high sensitivity/low noise magnetometer with automatic hemisphere switching and a wide voltage range, the static noise rating for the unit is +/- 0.01 nT. On the AGIS screen the operator can view the raw magnetic response, the magnetic fourth difference and the survey altitude for immediate QC of the magnetic data. The magnetic data is recorded at 10 Hz. A magnetic compensator is also used to remove noise created by the movement of the helicopter as it pitches, rolls and yaws within the Earth’s geomagnetic field.

**Base Station:**

For monitoring and recording of the Earth’s diurnal magnetic field variation, Precision GeoSurveys operates two GEM GSM-19T magnetometer base stations continuously throughout the airborne data acquisition survey. The base station is mounted as close to the survey blocks, and in an area with low magnetic gradient, as possible to give accurate magnetic field data. It is also mounted in an area away from electric transmission power lines and moving ferrous objects, such as aircrafts and motor vehicles. The GEM GSM-19T magnetometer with GPS (Figure 9) uses the proton precession technology sampling at a rate of 0.5 Hz. The GSM-19T has an accuracy of +/- 0.2 nT at 1 Hz. Base station data recorded in the solid-state memory of the base station, are downloaded onto a field laptop using GEMLink 5.0 software. Profile plots of the base station readings are generated and updated at the end of each survey day.

**Laser Altimeter:**

The pilot is provided with terrain guidance and clearance with an Acuity AccuRange AR3000 laser altimeter. This is attached at the aft end of the magnetometer boom. The AR3000 sensor is a time-of-flight sensor that measures distance by a rapidly modulated and collimated laser beam that creates a dot on the target surface. The maximum range of the laser altimeter is 300 m off of natural surfaces with 90% reflectance and 3 km off special reflectors. Within the sensor unit, reflected signal light is collected by the lens and focused onto a photodiode. Through serial communications and analog outputs, the distance data are transmitted and collected by the AGIS at 10 Hz.

**Data Acquisition Magnetometer Checks:**

At the start of the survey, airborne magnetometer system tests were conducted. The three tests conducted were the compensation flight test, heading error test, and the lag test.

**Compensation Flight Test:**

During aeromagnetic surveying, noise is introduced to the magnetic data by the aircraft itself. Movement in the aircraft (roll, pitch and yaw) and the permanent magnetization of the aircraft parts (engine and other ferric objects) are large contributing factors to this noise. To remove this noise a process called magnetic compensation is implemented. The magnetic compensation process starts with a test flight at the beginning of the survey where the aircraft flies in the four orthogonal headings required for the survey ( $066^{\circ}/246^{\circ}$  and  $156^{\circ}/336^{\circ}$  in the case of this survey) at an altitude where there is no ground effect in the magnetic data. In each heading, three specified roll, pitch, and yaw maneuvers are performed by the pilot; these maneuvers provide the data that is required to calculate the necessary parameters for compensating the magnetic data.

**Lag Test:**

Followed by the compensation flight, a lag test is conducted. This is performed to determine the relationship between the time the digital reading was recorded by the instrument and the time for the position fix for fiducial of the reading was obtained by the GPS system. The test was flown in the four orthogonal headings over an identifiable magnetic anomaly (ie.Truck, Trailer, etc.) at survey speed and height. A lag of 5 fiducials (0.5 seconds) was determined from the lag test.

**Heading Error Test:**

To determine the magnetic heading effect a cloverleaf pattern flight test is conducted. The cloverleaf test is flown in the same heading as the survey and tie lines. For each direction, it must fly over a recognizable feature on the ground in order to estimate the heading error.

**Data Processing:**

After a survey flight all of the data is collected and several procedures are undertaken to ensure that the data meets a high standard of quality. All data was processed using Pico Envirotec software and Geosoft Oasis Montaj geophysical processing software.

**Magnetic Processing:**

Before any processing and editing of the raw magnetic data, the data obtained from the compensation flight test must first be applied to the raw magnetic data. A computer program called PEIComp is used to create a model from the compensation flight test for each survey to remove the noise induced by aircraft movement; this model is applied to each survey flight so the data can be further processed. Filtering is applied to the laser altimeter data to remove vegetation clutter and to show the actual ground clearance. To remove vegetation clutter a Rolling Statistic filter is applied to the laser altimeter data and a low pass filter is used to smooth out the laser altimeter profile to remove isolated noise. As a result, filtering the data will yield a more uniform surface in close conformance with the actual terrain. The processing of the magnetic data involved the correction for diurnal variations. The base station data collected is edited, plotted and merged into a Geosoft (.gdb) database daily. The airborne magnetic data is corrected for diurnal variations by subtracting the observed magnetic base station deviations. Following the diurnal correction was a lag correction. A lag correction of 0.5 seconds was applied to the total magnetic field data to compensate for the lag in the recording system as the magnetometer sensor flies 5.70 m ahead of the GPS antenna. Lastly, a heading correction was applied to the data. Some filtering of the magnetic data is also required. A non-linear filter was used for spike removal. The 1D Non-Linear Filter is ideal for removing very short wavelength, but high amplitude features from data. It is often thought of as a noise spike-rejection filter, but it can also be effective for removing short wavelength geological features, such as signals from surficial features. The 1D Non-Linear Filter is used to locate and remove data that is recognized as noise. The algorithm is 'non- linear' because it looks at each data point and decides if that datum is noise or a valid signal. If the point is noise, it is simply removed and replaced by an estimate based on surrounding data points. Parts of the data that are not considered noise are not modified. The combination of a non-linear filter for noise removal and a low pass trend enhancement filter resulted in level data as indicated in the results section of this report. The low pass filter smoothes out the magnetic profile to remove isolated noise. The corrected magnetic data from the survey and tie lines was used to level the data all together. Two forms of levelling are applied

to the corrected data: conventional levelling and micro-levelling. There are two components to conventional levelling; the first involves statistical levelling of magnetic data to correct miss ties (intersection errors) followed by specific patterns or trends. For the second component, tie lines are brought to a common regional base value, using the mean value of the cross-level error. To obtain the best possible levelled data, individual corrections are edited at selected intersections. Lastly, micro-levelling is applied to the corrected conventional levelled data. This will remove any residual line-direction-related noise, and any low amplitude component of flight line noise, that still remains in the data after tie line levelling.

### Final Data Format

Abbreviations used in the GDB files are listed in **table 5**:

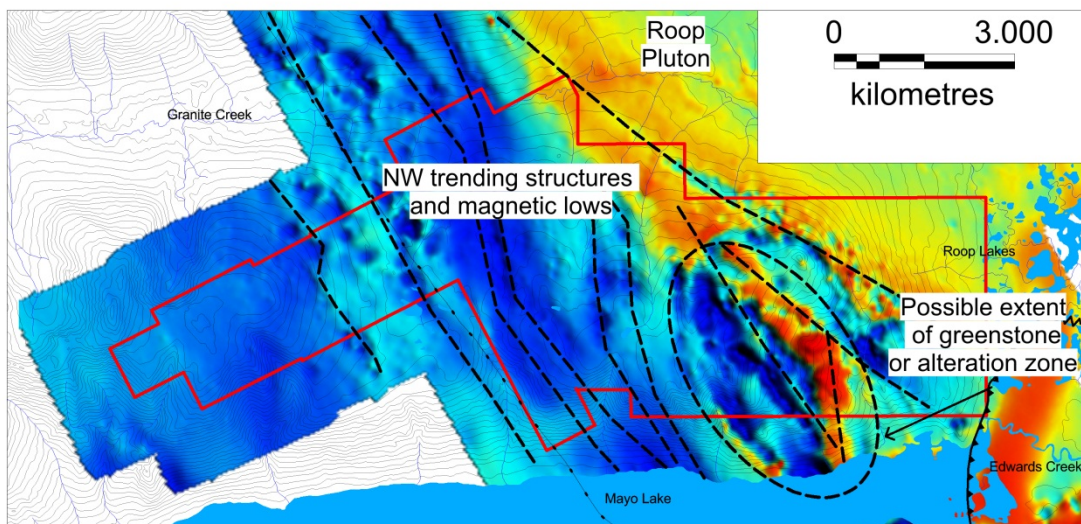
Channel	Units	Description
<b>X</b>	M	UTM Easting - WGS84 Zone8 North
<b>Y</b>	M	UTM Northing - WGS84 Zone 8 North
<b>Galt</b>	M	GPS height - WGS84 Zone 8 North
<b>DTM</b>	M	Digital Terrain Model
<b>Lalt</b>	M	Laser Altimeter readings
<b>GPStime</b>	Hours:min:secs	GPS time
<b>Basemag</b>	nT	Base station diurnal data
<b>Mag</b>	nT	Total Magnetic Intensity

**Table 5** Mayo Lake Block C survey channel abbreviations

The files are provided in two (2) formats, the first is a .GDB file for use in Geosoft Oasis Montaj, and the second is a text format .XYZ file. A complete file, provided in each format will contain raw magnetic data.

### Results

A review of print-outs of the total magnetic intensity (**Figure 6**) and the calculated vertical gradient show numerous features that suggest faults, intrusions and alteration zones. The geophysical features suggest the presence of mainly intersecting NW and NNW trending structures (faults) and magnetic lows (alteration zones). Some magnetic highs are likely greenstone sills which outcrop and may underlie Keno Hill Quartzite at a shallow level. The data requires further interpretation by an expert; to better



understand the precise nature and location of the above discussed features.

**Figure 6** Total magnetic intensity from survey Block C with Carlin Claim Block

## Discussion and Conclusions

The Tintina Gold Belt, in which the Property lies, extends for more than 2100 km along the length of the North American Cordillera in Alaska and Yukon. It contains gold and silver deposits that are spatially and temporally associated with Cretaceous age plutonism. In general, bismuth-tungsten-tellurium signatures characterize deposits hosted by granitoid rocks while those hosted by sedimentary rocks and dyke systems characteristically have arsenic-antimony signatures (Goldfarb, et al 2000). Significant differences in structural styles, levels of deposit emplacement, ore-fluid chemistry and gold grades suggest that the prospects represent a broad range of depositional environments.

Several features make deposits in the Tintina Gold Belt desirable exploration and mining targets. The deposits have good size potential, for example Dublin Gulch is reported to contain 6.4 million ounces gold at a grade of 0.62 g/t and Brewery Creek is reported to contain 825,000 ounces gold at a grade of 1.36 g/t prior to production. The Fort Knox deposit is reported to contain 7 million ounces gold, at a grade of 0.9 g/t and POGO, an orogenic vein deposit, contains approximately 4 million ounces gold at a grade of 16 g/t.

The Property is most likely to host deposits related to the Tombstone Plutonic Suite. Mineralization would be late peripheral silver-lead-zinc veins (Keno Hill Type), or steeply dipping sheeted gold veins and stockworks (Reduced Intrusion Related Gold) within both intrusive and metasedimentary host rocks. If carbonate horizons are present they may react with mineralizing fluids and host either gold-arsenic-copper-bismuth-tungsten skarn or Carlin-type mineralization. The high quality aeromagnetics discussed in this report have outlined structural and alteration targets, which in combination with the location of placer deposits, can guide further exploration for gold and silver deposits.

The magnetics clearly define a long NW trend to highs and lows in the western portion of the property. Previous work by Lynch, 2006 indicates the presence of decalcified alteration following a trend similar to structures observed in the geophysics, possibly trends of decalcified units that could host Carlin-type mineralization. This indicates good size potential for any mineralization discovered during follow up exploration on claims; also it is probable that parallel structures observed in magnetics are similar in character. Work is currently being undertaken by an independent geophysicist to provide greater interpolation of geophysical data. Further exploration should involve geochemical soil and stream sediment sampling to investigate potential structures, alteration and intrusions defined by the airborne magnetics. Prospecting and detailed mapping of the anomalies will also be required to define the extent of intrusions, alteration and potential mineralization.

## References

Becker, T.C.

2000 Assessment Report 094179, on the Black Property, Black Creek, Mayo Mining District, Yukon Territory for Archer, Cathro & Associates (1981) Limited, October, 2000.

Bond, J.D.

1999. Glacial limits and ice-flow map, Mayo area, central Yukon (1:250,000 scale) Exploration and Geological Services Division, Yukon, Indian and Northern Affairs Canada, Open File 1999-13.

Boyle, R.W.

1965 Geology, Geochemistry and Origin of the Lead-Zinc-Silver Deposits of the Keno Hill-Galena Hill Area, Yukon Territory. Geological Survey of Canada Bulletin 11

Gleeson, C.F., Boyle, R.W.

1980a Minor and Trace Element Distribution in the Heavy Minerals of the Rivers and Streams of the Keno Hill District Yukon Territory. Geological Survey of Canada Paper 76-31.

Gleeson, C.F., Boyle, R.W.

1980b The Lithogeochemistry of the Keno Hill District Yukon Territory. Geological Survey of Canada Paper 77-31.

Gleeson, C.F. et. Al. (9 Maps)

1965 (Ag, As, B, Cu, Ni, Pb, Sb, W+Sn, Zn) Content of Stream and Spring sediments, Keno Hill Area, Yukon Territory; Geol. Surv. Can., Map 45- 50, 52-53, 56-1965

Gleeson, C.F., Boyle, R.W.

1972 Gold in Heavy Mineral Concentrates of stream Sediments, Keno Hill Area, Yukon Territory. Geological Survey of Canada Paper 71-51.

Goldfarb, R., Hart, C., Miller, M., Miller, L., Farmer, G.L. and Groves, D.

2000 The Tintina Gold Belt - A Global Perspective *in* The Tintina Gold Belt: Concepts Exploration and Discoveries, Special Volume 2, British Columbia and Yukon Chamber of Mines Cordilleran Roundup, January 2000.

Green, L.H.

1971. Geology of Mayo Lake, Scougale Creek and McQuesten Lake map areas, Yukon Territory (105M/IS, 1060/2, 106 D/3). Geological Survey of Canada, Memoir 357,72 p.

Hughes, O.L.

1982 Surficial geology and geomorphology, Mount Edwards, Yukon Territory; Geological Survey of Canada, Map5-1982 (1:100,000)

Lynch, G.

2006 Sediment-hosted disseminated gold occurrence, northeast Mayo Lake area. *in* Yukon Exploration and Geology 2005, D.S. Emond, G.D. Bradshaw, L.L. Lewis and L.H. Weston (eds.), Yukon Geological Survey, p. 327-339.

Murphy, D.C.

1997 Geology of the McQuesten River Region, Northern McQuesten and Mayo Map Areas, Yukon Territory (105P/14, 15, 16; 105M/B, 14); Exploration and Geological Services Division, Indian and Northern Affairs Canada; Bulletin 6, p. 122.

Roots, C. F.

1997. Geology of the Mayo }-hp Area, Yukon Territory (105M). Exploration and Geological Services Division, Yukon, Indian and Northern Affairs Canada, Bulletin 7, 82 p.

## **Appendix A**

### Statement of Expenditures

Cost per km: \$67.89

Number of Km: 731.6km

Total Expenditure: \$49670.51

Number of Claims: 233

Expenditure per claim: \$213.18

This survey was completed as part of a larger geophysics program that covered six additional nearby claim blocks. As a result many of the flight lines transect this claim group and two of the nearby claim groups. In total, on the three claim groups included in this block (Block C) 2399km of geophysical survey were flown at a rate of \$67.89 per km for a total of \$162868.00 for all three claim groups together. This breakdown is based on the percentage of claims in the block from this claim group, 233 of a total 764 or 30% of the claims in the block.

## Appendix B

### Statement of Qualifications

Dr. V.N. Rampton, P.Eng.

Rampton Resources Group Inc.

P.O. Box 158, 3226 Carp Road

Carp, Ontario. K0A 1L0

Tel: (613) 836-2594; E-mail: [vrampton@rogers.com](mailto:vrampton@rogers.com)

I, V.N. Rampton, Ph.D., P.Eng., do hereby certify that

1. I am President of Rampton Resource Group Inc. and President and CEO of Mayo Lake Minerals Inc.
2. I graduated with a B.Sc. Eng. (Geology) from University of Manitoba in 1962 and with a Ph.D. (Geology) from University of Minnesota in 1969.
3. I am a member of the Professional Engineers of Ontario.
4. I have worked as a geologist for over 50 years, specifically in mineral exploration for the last 40 years, in Canada, Slovakia, Finland, Spain, Burkina Faso, Jamaica and the United States of America.
5. By reason of my education, affiliation with a professional organization (as defined in N.I. 43-101) and past relevant work experience, I fulfill the requirements of a "qualified person" for the purposes of N.I. 43-101.
6. By reason of my being CEO, President and a Director and my share holdings in Mayo Lake Minerals Inc., I am not an "independent qualified person" for the purposes of N.I. 43-101.
7. I am senior author and bare total responsibility for the preparation of the technical report titled "Assessment report on the Carlin Claim Group Geophysical Survey". The technical information contained within the report was collected for us by Precision Geosurveys Inc.

Dated the 27<sup>th</sup> day of August, 2012.



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Vernon Neil Rampton

Tyrell Sutherland B.Sc.

Mayo Lake Minerals Inc.

P.O. Box 158, 3226 Carp Road

Carp, Ontario. K0A 1L0

Tel: (613) 884-8332; E-mail: [tyrellsutherland@hotmail.com](mailto:tyrellsutherland@hotmail.com)

I, T.B. Sutherland, B.Sc., do hereby certify that

1. I am an authorized agent of Mayo Lake Minerals Inc.
2. I graduated with a B.Sc. Honors Specialization Geology, from University of Ottawa in 2009
3. I am a member of the Prospectors and Developers Association of Canada.
4. I have worked as a geologist for approximately 3 years, specifically in mineral exploration, in Canada, Australia, Jamaica and China.
5. I do not fulfill the requirements of a "qualified person" for the purposes of N.I. 43-101.
6. I am a co-author and to the best of my knowledge all data used in the preparation of the technical report titled "Assessment report on the Carlin Claim Group Geophysical Survey" is correct and of good quality. The technical information contained within the report was collected for us by Precision Geosurveys Inc.

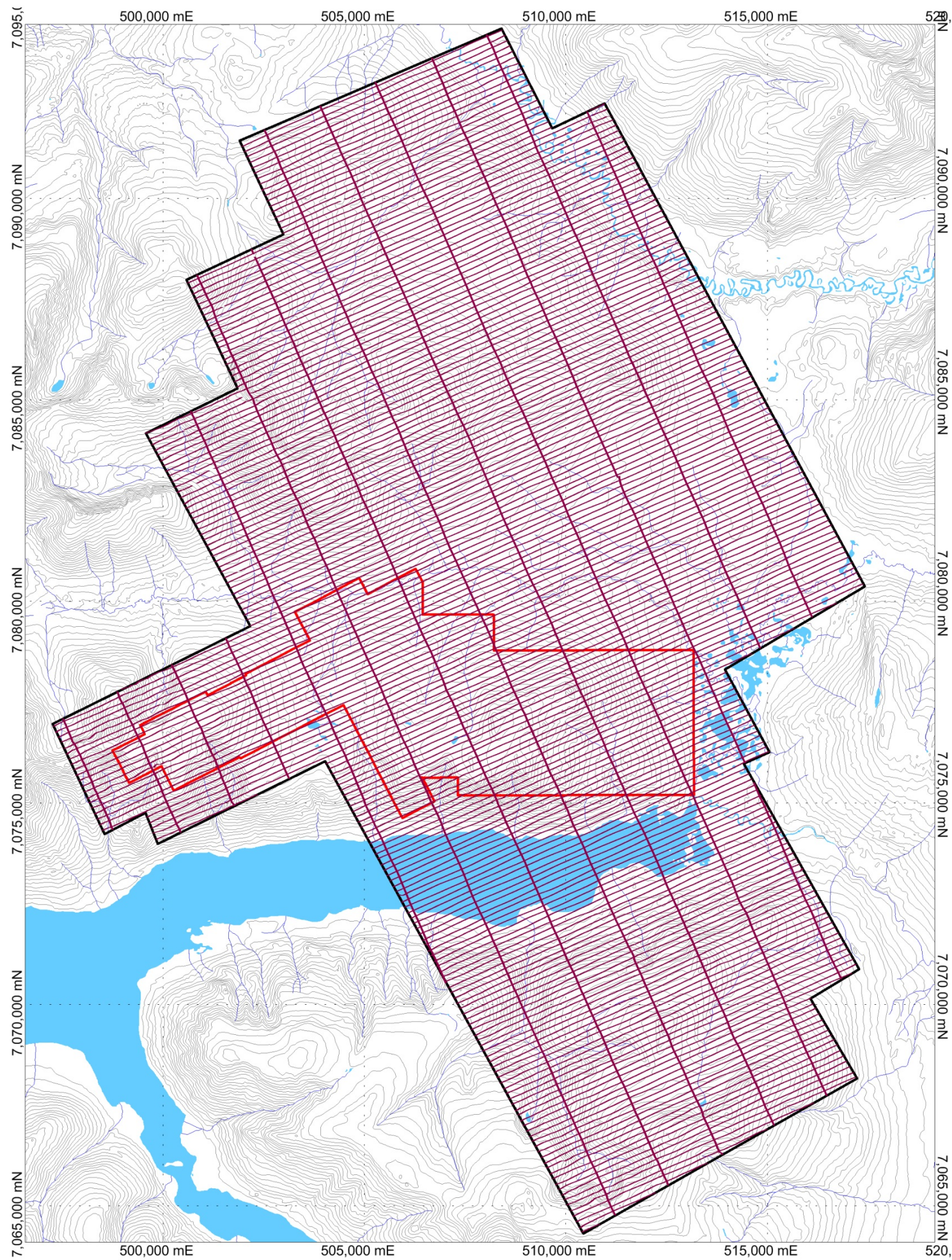
Dated the 27<sup>th</sup> day of August, 2012.



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Tyrell Brodie Sutherland

**Appendix C**  
Geophysical Data



**LEGEND**

**Map Projection:**  
 Projection: Universal Transverse Mercator  
 Central Meridian: 225 Zone 8N  
 Datum: WGS 84

**Survey Dates:** March 05, 2012 to March 13, 2012  
**Survey Base:** Mayo, YT  
**Helicopter Type:** Bell 206 Jet Ranger  
**Registration:** C-FZHK  
**Survey Technology:** Magnetic survey

**SURVEY PARAMETERS:**

Mean Terrain Clearance:	35 meters
Helicopter:	35 meters
Magnetometer:	35 meters
Spectrometer:	35 meters

**Block C:**

Survey Line Spacing:	150 meters
Survey Line Direction:	066°-246°
Tie Line Spacing:	1500 meters
Tie Line Direction:	156°-336°

**AIRBORNE SYSTEMS:**

Scintrex CS-3 Magnetometer Sensor

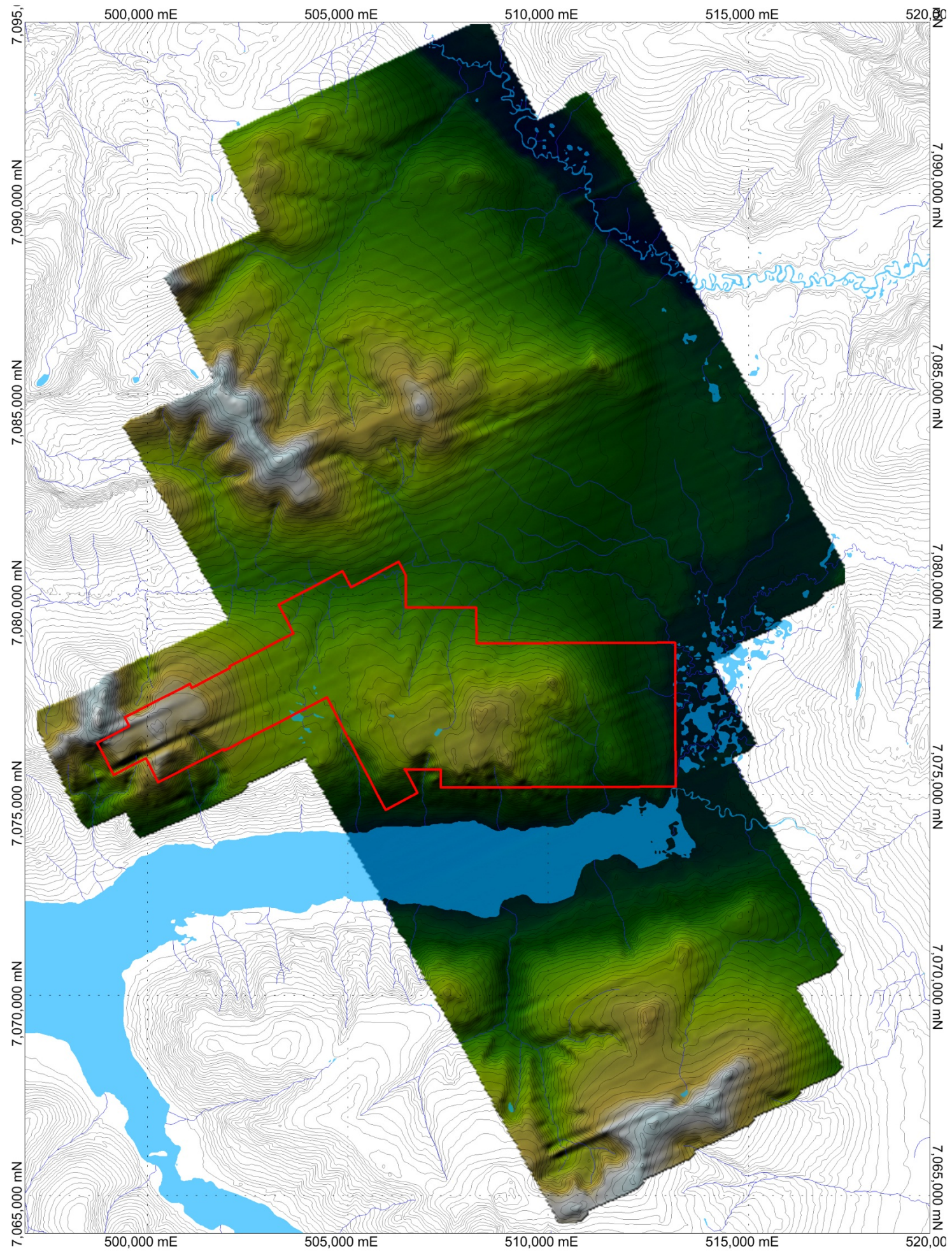
Configuration:	Stinger with 3 axis compensation
Sample Rate:	10 Hz
Sensitivity:	0.01 nT

N

# Mayo Lake Minerals Inc.

## Flight Path Block C





**LEGEND**

**Map Projection:**  
 Projection: Universal Transverse Mercator  
 Central Meridian: 225 Zone 8N  
 Datum: WGS 84

Survey Dates: March 05, 2012 to March 13, 2012  
 Survey Base: Mayo, YT  
 Helicopter Type: Bell 206 Jet Ranger  
 Registration: C-FZHK  
 Survey Technology: Magnetic survey

**SURVEY PARAMETERS:**

Mean Terrain Clearance:	35 meters
Helicopter:	35 meters
Magnetometer:	35 meters
Spectrometer:	35 meters

**Block C:**

Survey Line Spacing:	150 meters
Survey Line Direction:	066°-246°
Tie Line Spacing:	1500 meters
Tie Line Direction:	156°-336°

**AIRBORNE SYSTEMS:**

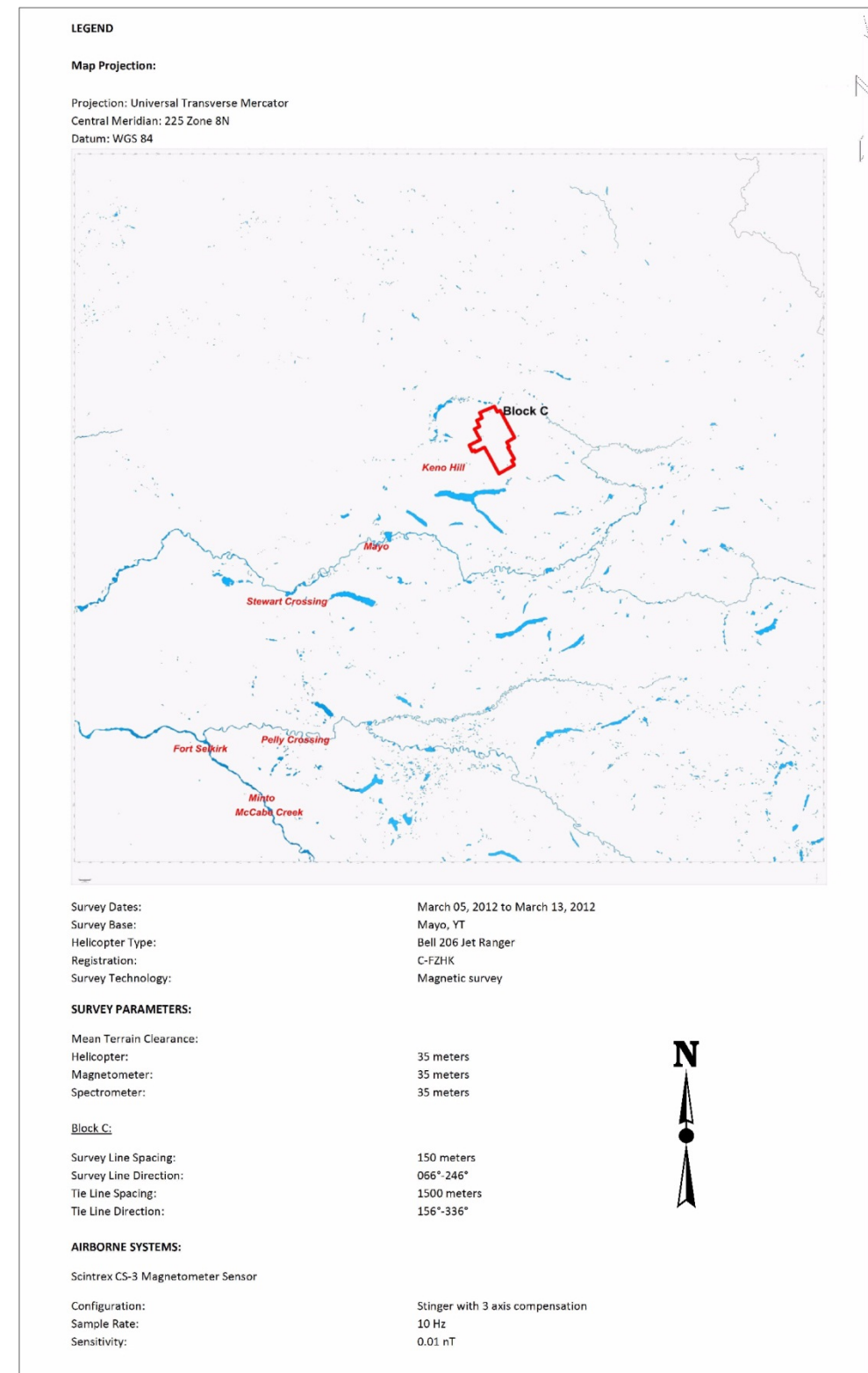
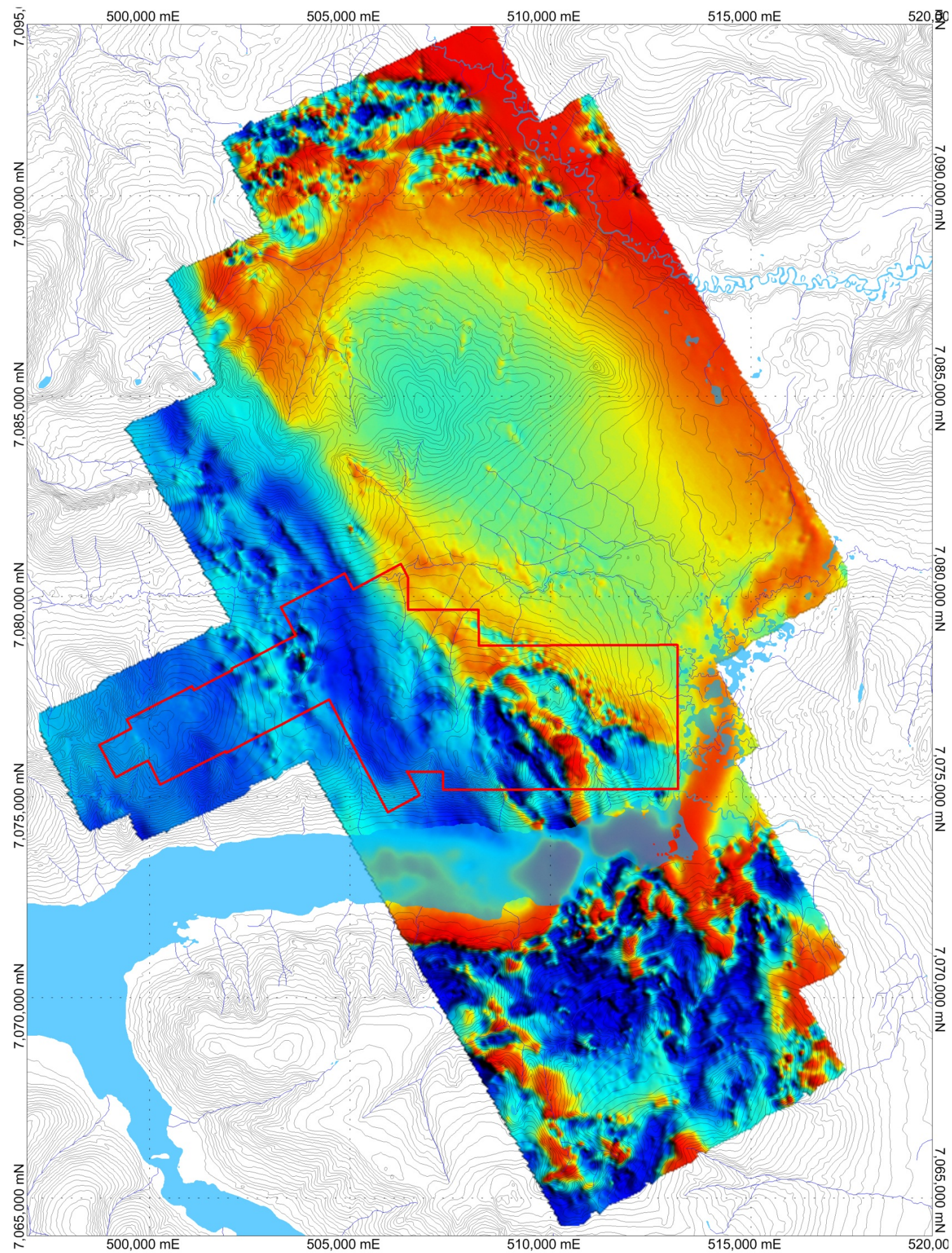
Scintrex CS-3 Magnetometer Sensor	
Configuration:	Stinger with 3 axis compensation
Sample Rate:	10 Hz
Sensitivity:	0.01 nT

N

# Mayo Lake Minerals Inc.

## Digital Elevation Model Block C

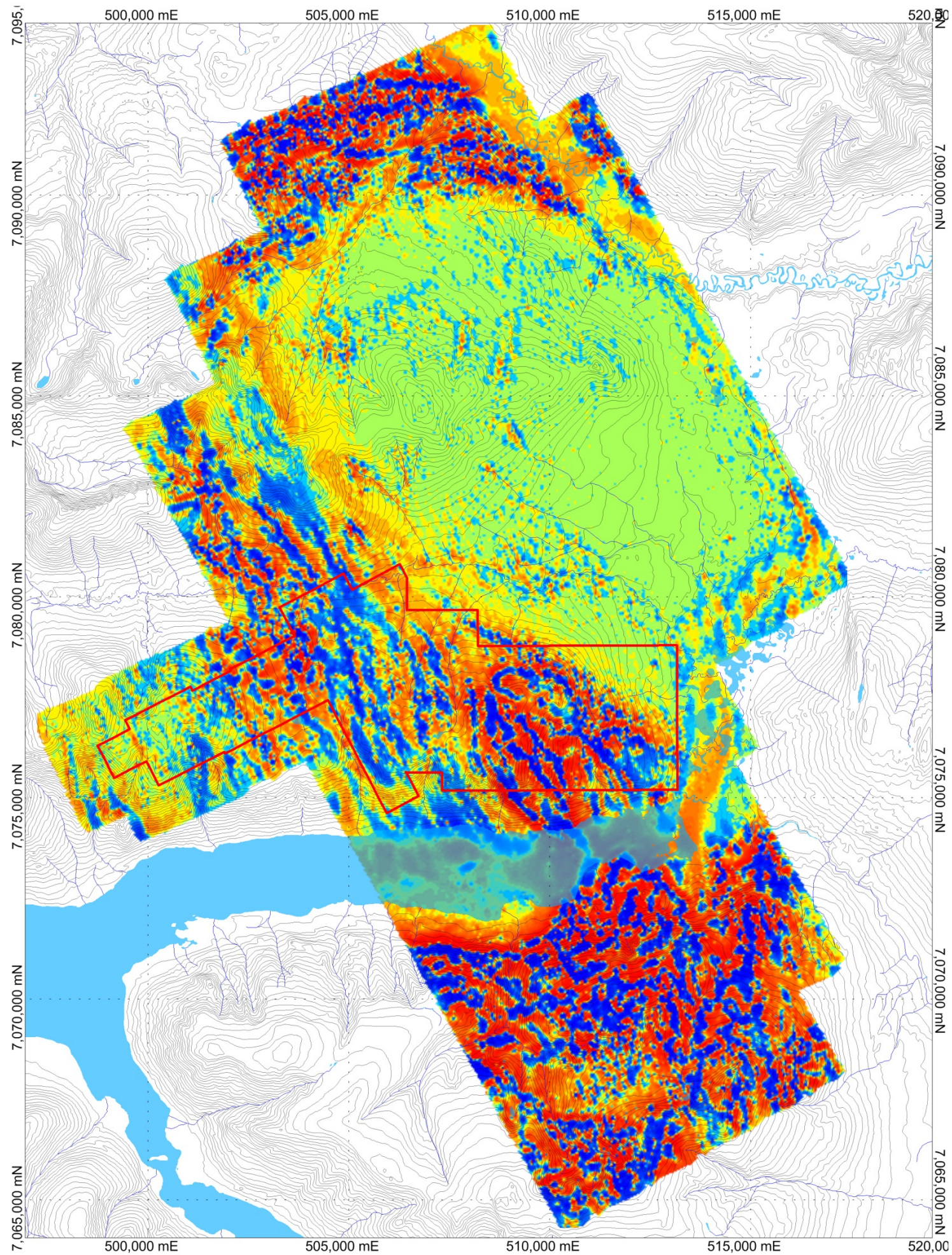




# Mayo Lake Minerals Inc.

## Total Magnetic Intensity Block C





**LEGEND**

**Map Projection:**  
 Projection: Universal Transverse Mercator  
 Central Meridian: 225 Zone 8N  
 Datum: WGS 84

<b>Survey Dates:</b>	March 05, 2012 to March 13, 2012
<b>Survey Base:</b>	Mayo, YT
<b>Helicopter Type:</b>	Bell 206 Jet Ranger
<b>Registration:</b>	C-FZHK
<b>Survey Technology:</b>	Magnetic survey

**SURVEY PARAMETERS:**

Mean Terrain Clearance:	35 meters
Helicopter:	35 meters
Magnetometer:	35 meters
Spectrometer:	35 meters

**Block C:**

Survey Line Spacing:	150 meters
Survey Line Direction:	066°-246°
Tie Line Spacing:	1500 meters
Tie Line Direction:	156°-336°

**AIRBORNE SYSTEMS:**

Scintrex CS-3 Magnetometer Sensor	
Configuration:	Stinger with 3 axis compensation
Sample Rate:	10 Hz
Sensitivity:	0.01 nT

# Mayo Lake Minerals Inc.

## Calculated Vertical Gradient Block C

