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ASSESSMENT REPORT

on the

LARDER LAKE PROPERTY

Abitibi Subprovince

Katrine, Ossian, Pontiac tps.,
Larder Lake Mining Division

LARDER LAKE, ONTARIO

NTS 32D/4, 32D/5 NAD 83 Zone 17N E604780 N5346090

Lat. 48° 15’ 33” Long. -79° 35’ 13”

for

TRILLIUM GOLD MINES INC.

8.11.22

T.N.J. Hughes, P. Geo

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SUMMARY

The Larder Lake Property (hereafter 'LLP'), comprises 14 single-cell mining claims within two separate blocks, ('North' and 'South'), covering an area of respectively 40.5 km^2 and 6.04 km^2 and held under option from Solstice Gold Corp. by Trillium Gold Mines. Inc. ('TGM'). It is located north of the town of Larder Lake, north-eastern Ontario, and lies within the townships of Katrine, Ossian and Pontiac, adjacent to the Quebec border and Labyrinthe Lake.

From the 28th – 29th March, 2022, Precision GeoSurveys flew a high-resolution helicopter-borne magnetic survey over the entire property.

The property is covered by a variably thick Quaternary cover of till and re-worked till, with far western and eastern areas underlain by north-south trending eskers. Both features have been exploited for gravel and road access.

It is underlain by a sequence of Archæan felsic-intermediate-mafic metavolcanic rocks, sparse interflow and intercalated sediments of the Blake River Assemblage, plus younger, minor diorite-gabbroic intrusions. Several diabase dykes of the Matachewan dyke swarm transect the property in a NNW-SSE to NW-SE direction.

Studies covering volcanology, stratigraphy, geochronology and structural geology indicate the geology on and around the project is representative of flanking volcanic deposits and sundry secondary felsic volcanic centres related to the formation and development of the Blake River megacaldera complex, a multi-vent complex with three caldera-forming events, the early Misema, the New Senator and the Noranda caldera that over time created the giant Misema Caldera, some 80 km in diameter. Its formation and geometry provided controls on the geological setting of several base metal and Au-base metal mines in Quebec, including Horne and New Insco.

The LLP has received various levels of exploration, with the much of the work focussed on discovering extensions to the gold mineralisation at the historic Ossian Gold Mines Ltd. property, now within patented ground which is partially enclosed by the larger TGM North claim block.

At Ossian, a mineralised quartz vein was traced on surface for a minimum 165 m, and by underground and surface drilling, an additional ca. 350 feet (100 metres) east and west, and to depths of greater than 400 ft. It was exploited by a 200 ft deep shaft and on two levels. Average width for the main quartz vein is a little over 10 feet (3.5 m), with a south-parallel vein less than 2 feet (0.5 m) in width. Both dip steeply south, with minor splays. Average grades were erratic but around 4 g/t Au over 1.5m (gross average), and in some instances unreproducible. Dump material ran 0.09 oz Au/ton. The venture never made a profit, was widely promoted and fell into disrepair then abandoned, with intermittent, limited work returning no improvement in grades and widths along strike and at depth.

Additional areas with relatively active but historic exploration include the northernmost claims on the North claim block, which were subject to base metals exploration over geological

extensions to the volcanic suite extending SE from Death Lake to the NW of the LLP, and the felsic volcanic edifice at Clarice Lake, on the Québec border.

Base metals exploration to the north of the property was in full swing in the 90's with Orofino, Rio Algom and Amax to name but a few. Some work extended onto the Larder Lake property, to Sunrise Lake and points east, but few geophysical targets (typically mag. and MaxMin), were deemed worthy of follow-up. More favourable base metal stratigraphy was considered to be farther north, around Death and Clarice lakes, where significantly more felsic volcanic lithologies, (the main base metal target), are exposed, especially around Clarice.

There was considerable exploration in the 90's by Agnico-Eagle in neighbouring Montbray Tp., PQ, which extended into Pontiac Tp. (Ontario) and onto the NE corner of the LLP. Anomalous gold in tills, follow-up prospecting, geophysics and drilling resulted in the discovery of at least four zones, Montbray, Lucky, Twin and Westex, these along a NE-SW alteration corridor that likely extends into Pontiac Tp., and may be co-incident with VTEM anomalies. Two, perhaps three parallel 'corridors' with epidote-silica-chlorite-(carbonate)-haematite alteration and sparse sulphides were discovered by prospecting and drilling, however the southwesternmost drilling suggested more potential was farther NE around the Montbray showing. Ultimately, poor results caused the project to be terminated.

Exploration for extensions to the gold mineralisation at the nearby 100-year-old Russian Kid mine in Dasserat Township, PQ has taken place intermittently. The mine is located less than four km east of the LLP. Mineralisation was discovered in a 'gabbro' (diorite), sill some two km from the TGM eastern border, and east and north of Lac Labyrinthe.

In 2010, measured resources were estimated at 124,800 t at 6.95 g/t Au, indicated resources at 445,400 t at 6.40 g / t Au and inferred resources at 1.51 Mt at 7.40 g/t Au, these with a cut-off grade of 3 g / t Au. (May 25, 2010, SGS, NI 43-101 Technical Report filed on SEDAR June 1, 2010). Since the late 90's production and development have been intermittent due to problems with financing, erratic grades or insufficient material, ageing or poor-quality mill equipment, and several episodes of insolvency, the latest being 2019 when Nippon Dragon went into receivership.

Most recent drilling along strike from the Russian Kid deposit located reasonable gold grades in two structures at or near the diorite sill north and south contacts, suggesting a greater structural control on overall mineralisation and possible continuance of same westwards across Lac Labyrinthe onto the LLP. There is some suggestion that geophysical surveys by Silver Century and associated have located such an extension with the discovery of several IP responses on the LLP. Several targets remain untested by drilling. However, there is no definitive geological evidence to indicate western continuity of the structures flanking the Russian Kid mine onto the LLP or Ontario, in general.

Much of the LLP remains underexplored due in part to poor access and in several areas, swamp coverage or in the north-east, somewhat more rugged terrain apparently limiting prospecting and geophysical surveying.

Overall, historic exploration west of the Ossian Gold Mines exploration is negligible. There is a modicum of base metal-related exploration around Sunrise Lake to the north, a heavy concentration of exploration east of Ossian Gold Mines, targeting its eastern extension, with mapping, geophysics, diamond drilling and Reverse Circulation drilling. This area would be favourable for follow-up using historic IP survey data if grids can be accurately located.

There is only minor published exploration on the TGM South block, and geological information is largely inferred from work along strike, in Quebec by amongst others, Corp. Falconbridge, Nemrod, Flynn-Ber and Aur Resources. Their geology and geophysical work can be used to trace stratigraphy onto the block.

Overall, there has been an equal amount of exploration for precious and base metals, and away from the Ossian claims and adjoining ground, the majority of work focussed on base metals, due in no small part to the considerable success seen in Quebec within the same geological group. In Ontario, similar geology in west-neighbouring Ben Nevis township saw exploration extend east onto the LLP.

Most published geological maps indicate a more NW-SE strike to the North block but this may be the case only in the more northern half. Overall, strike on the North block is E-W to ENE-WSW. Several regional lineaments also trend in in the latter direction. These may represent possible P shears within a transpressional jog enclosing the Blake River Group. Overall, a regional strain ellipse would have R_1 trending NNW-SSE. Both would represent favourable exploration targets.

The possible two major structures controlling or delimiting the Russian Kid gold mineralisation likely extend into Ontario, with only the 'diorite' component tapering off. The majority of modern (<20 years) exploration on and around Russian Kid focussed on targets outside of the diorite, with positive results. The structures are E-W to ENE-WSW trending and represent a continuation of the Mulven Lake fault, a probable P shear which trends between the two TGM blocks. The OGS geology and regional geophysics indicates the Misema Lake-Mist Lake fault trends through the main TGM block, with potentially parallel faults to the north as similar strength targets.

The Montbray fault zone's extension into Ontario as the Misema Lake – Mist Lake fault host what Agnico-Eagle described as gold-bearing N-S trending structures (cf Sutherland's comments on Ossian mineralisation). These could represent R_1 shears, with mineralisation similar to that at Ossian GM.

RC drilling appears to have been quite successful in terms of gold grains discovered though much of the drilling was on or adjacent to the eastern esker complex. Grain morphology investigations concluded some of the grains may have a proximal source based on shape, though many were clearly re-worked with gold found in re-worked and basal till material. Overall, the source for many remains unknown. Large mechanised drilling is somewhat hampered by lack of access roads, swamp and in this area of the property, topography.

From interpretation of the Trillium airborne survey:

Possibly three broad, largely volcanic sequences, distinguished by gross differences in magnetic signature.

Scatted magnetic highs with limited strike length may represent small more mafic volcanic sequences in intermediate-mafic, felsic volcanic dominant sequences, or thin iron formations.

Larger, longer, broader magnetic highs are related to gabbro or diabase. This includes several Matachewan age diabase dykes.

The Misema fault – Mist Lake fault appears as a weak lineament cut by WNW-ESE faulting. It may represent a splay off the regional Cadillac-Larder Lake fault.

Recommendations

A high-resolution magnetic gradiometer survey be flown, the results from which should enhance the overall subtle magnetic signature over much of the property.

Based on the review of the exploration history, geology and the recently flown airborne survey, four main target areas are recommended for ground truthing, with focus on defining the volcanic stratigraphy.

Selected traverses for lithogeochemical sampling and age-dating to locate potential stratigraphic breaks that may relate to a volcanic hiatus and (mineralised) volcanic resurgence.

Review the IP surveys by Silver Century, 2420-2970 Quebec Inc./Belanger as they cover a potentially significant NE-SW structural trend that could represent the western extension of the Montbray fault or a south-parallel structure. Weak gold grades from Agnico drilling suggest it has some potential within a four km long tuff belt, a portion of which would trend through the northern part of the North block.

Review the results of the RC drilling by Silver Century/Sudbury Contact Mines and tie into the northern IP survey work and 'anomalies' where applicable. Several were diamond drill tested with negative results but others remain untested.

Review the association of Au-VMS deposits in Quebec with syn-volcanic faults.

Contract an experienced volcanologist to assist with volcanic facies identification and potential volcanic hiatuses representing possible changes in regional volcanic activity and by extension, the onset of (mineralised) volcanism and hydrothermal activity. This would in part test and expand on the Blake River Assemblage megacaldera model.

Lithogeochemical sampling, with a focus on carbonate alteration and its relative age (syn- or post-volcanic), chlorite and identification of any silicification rather than felsic volcanic bodies.

1.0 INTRODUCTION

This report covers a description and interpretation of the 2022 airborne geophysical survey, an examination of the exploration history and geology of the Larder Lake property, (hereafter, the 'LLP'), and adjacent areas.

Data from this survey was incorporated into an overall review of the geology, with recommendations made for a summer-fall exploration programme.

2.0 PROPERTY DETAILS

2.1 Location & Access

The Property is in the Larder Lake mining division approximately eight km north of Virginiatown and 15 km north-east of Larder Lake, Ontario. Its eastern boundary is at the Ontario-Québec border. The epicentre for the northern claim block is E604329 N5346295, and for the southern block, E609075 N5340876, UTM Zone 17, NAD 83

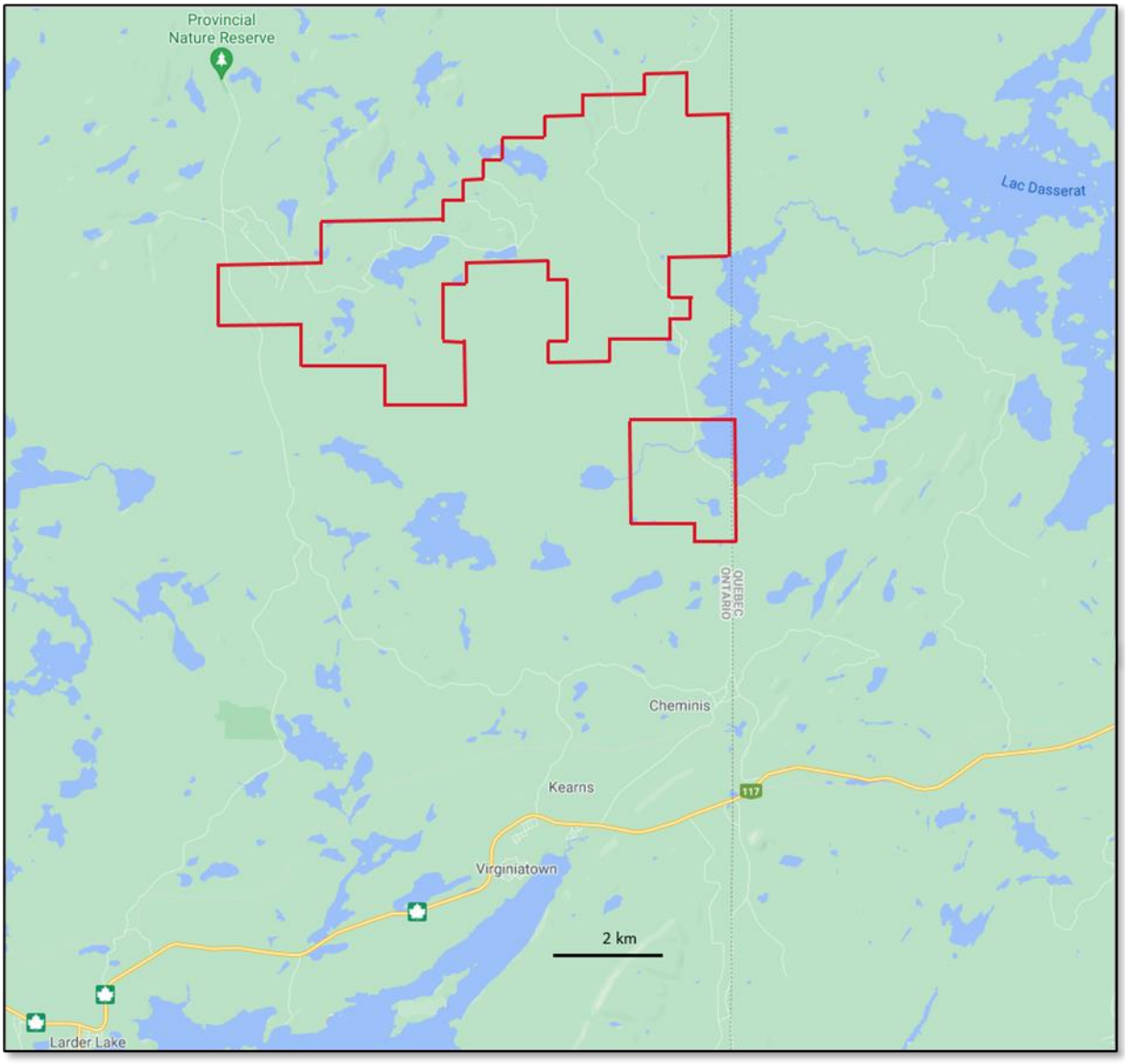


Figure 1 Location Map

Property Location, with closest Ontario settlements, and secondary roads (white)

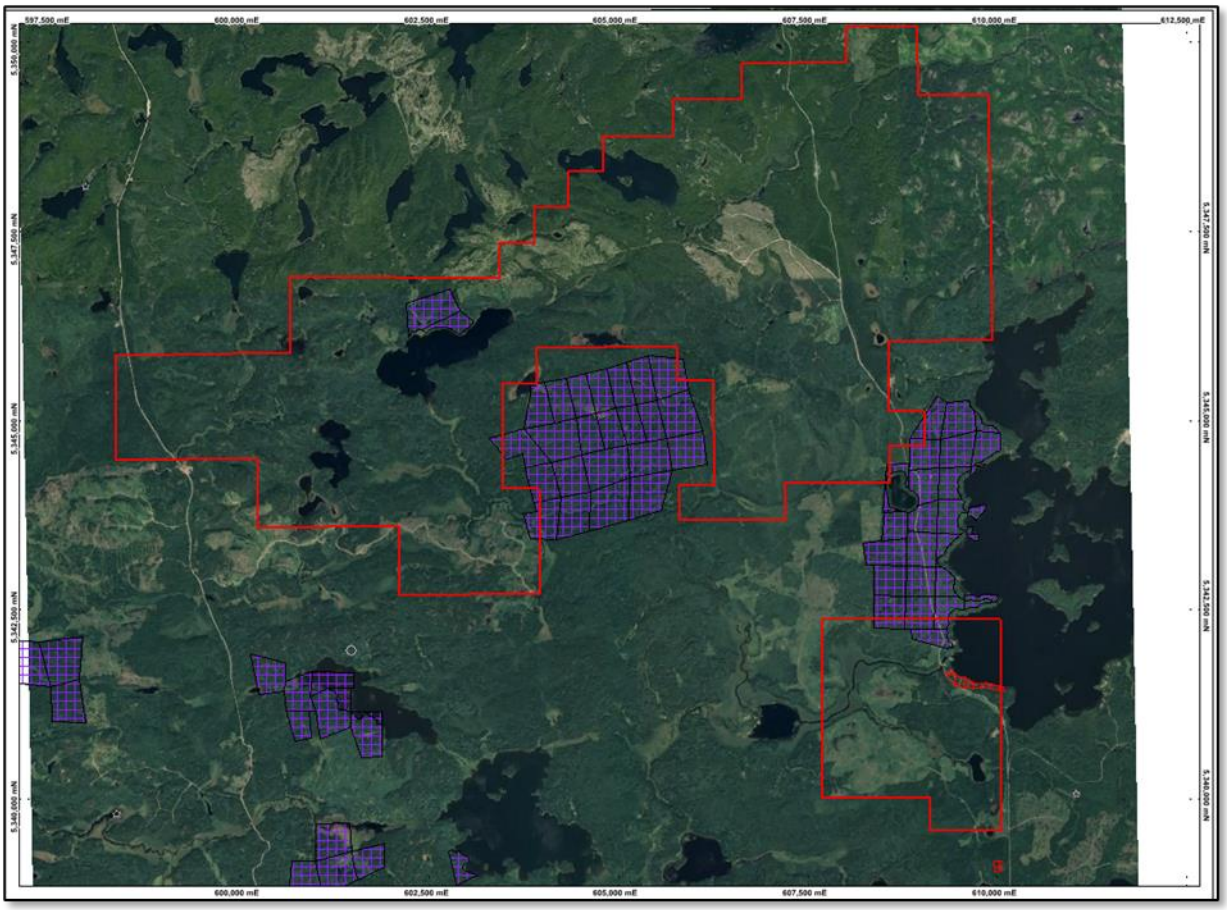


Figure 2 Claim block and property outline

Claim outline (red), land tenure (purple), and alienations (red hatches in SE, by Lac Labyrinth)

Access is north, off Hwy. 66, the Trans-Canada Highway, taking the Cheminis Road to the Ontario border, where it joins the Chemin du Lac Labyrinthe, passing through the southern claim block along the south-west shore of the Lake. The road continues north as the Chemin Morganston, passing through the northern claim block before swinging west then south, joining with the Larder Lake Station Road, which meets Hwy. 66 less than one km. east of the town of Larder Lake. The Station Road passes through the far western claims on the northern block.

2.2 Topography & Vegetation

The property is located in boreal forest and is largely covered by second growth poplar, pine, and spruce. The physiography is relatively flat to low undulose, with elevations from 335 m. asl to 420 m. Most of the higher elevations are located in the north and far west of the North block and are partly related to fluvioglacial ridges and knolls.

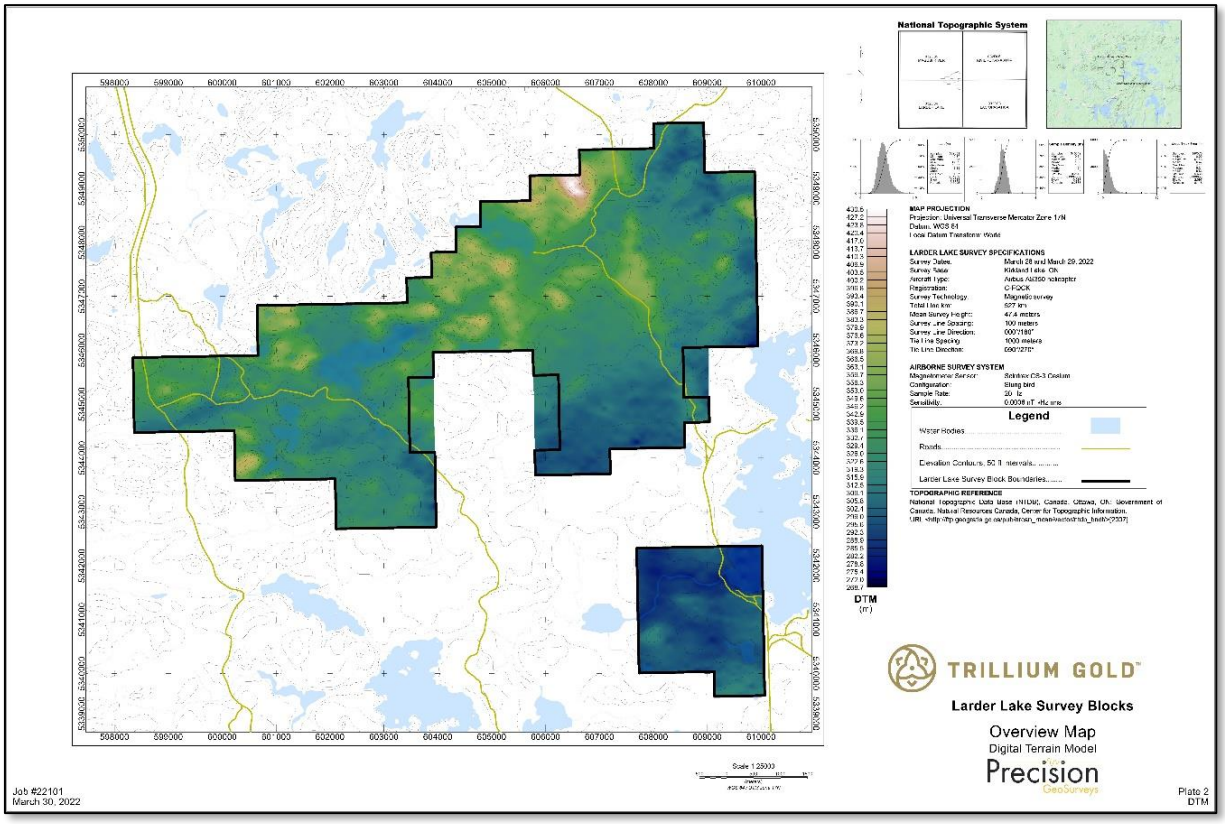


Figure 3 Larder Lake DTM

2.3 Claim Status

The property consists of thirteen multi-cell and one single-cell mining claims within two separate blocks of 3987 ha and 561 ha, held under option by Trillium Gold Mines Inc. from Solstice Gold Corp. The claim numbers are shown in Figure 2 and listed in Table 1. All claims were flown. Below,

Table 1 Property claims

Claim number	Tenure type	Tenure Status	Issue date	Due date	Claim holder	Area	No. of Cells
North block							
583509	Multi-cell Mining Claim	Active	4/8/2020	2/8/2023	(100) Solstice Gold Corp.	386.68	18
583510	Multi-cell Mining Claim	Active	4/8/2020	2/8/2023	(100) Solstice Gold Corp.	537.20	25
583511	Multi-cell Mining Claim	Active	4/8/2020	2/8/2023	(100) Solstice Gold Corp.	528.72	25
583514	Multi-cell Mining Claim	Active	4/8/2020	2/8/2023	(100) Solstice Gold Corp.	470.31	22
583515	Multi-cell Mining Claim	Active	4/8/2020	2/8/2023	(100) Solstice Gold Corp.	412.86	20
583516	Multi-cell Mining Claim	Active	4/8/2020	2/8/2023	(100) Solstice Gold Corp.	155.06	8
583518	Multi-cell Mining Claim	Active	4/8/2020	2/8/2023	(100) Solstice Gold Corp.	467.77	22
583637	Single Cell Mining Claim	Active	4/9/2020	2/9/2023	(100) Solstice Gold Corp.	18.40	1
583641	Multi-cell Mining Claim	Active	4/9/2020	2/9/2023	(100) Solstice Gold Corp.	150.34	7
583642	Multi-cell Mining Claim	Active	4/9/2020	2/9/2023	(100) Solstice Gold Corp.	64.45	3
583807	Multi-cell Mining Claim	Active	4/13/2020	2/13/2023	(100) Solstice Gold Corp.	365.26	17
584789	Multi-cell Mining Claim	Active	4/16/2020	2/13/2023	(100) Solstice Gold Corp.	429.62	20
South block							
583512	Multi-cell Mining Claim	Active	4/8/2020	2/8/2023	(100) Solstice Gold Corp.	518.37	25
583513	Multi-cell Mining Claim	Active	4/8/2020	2/8/2023	(100) Solstice Gold Corp.	43.03	2

Table 1 Claim Status

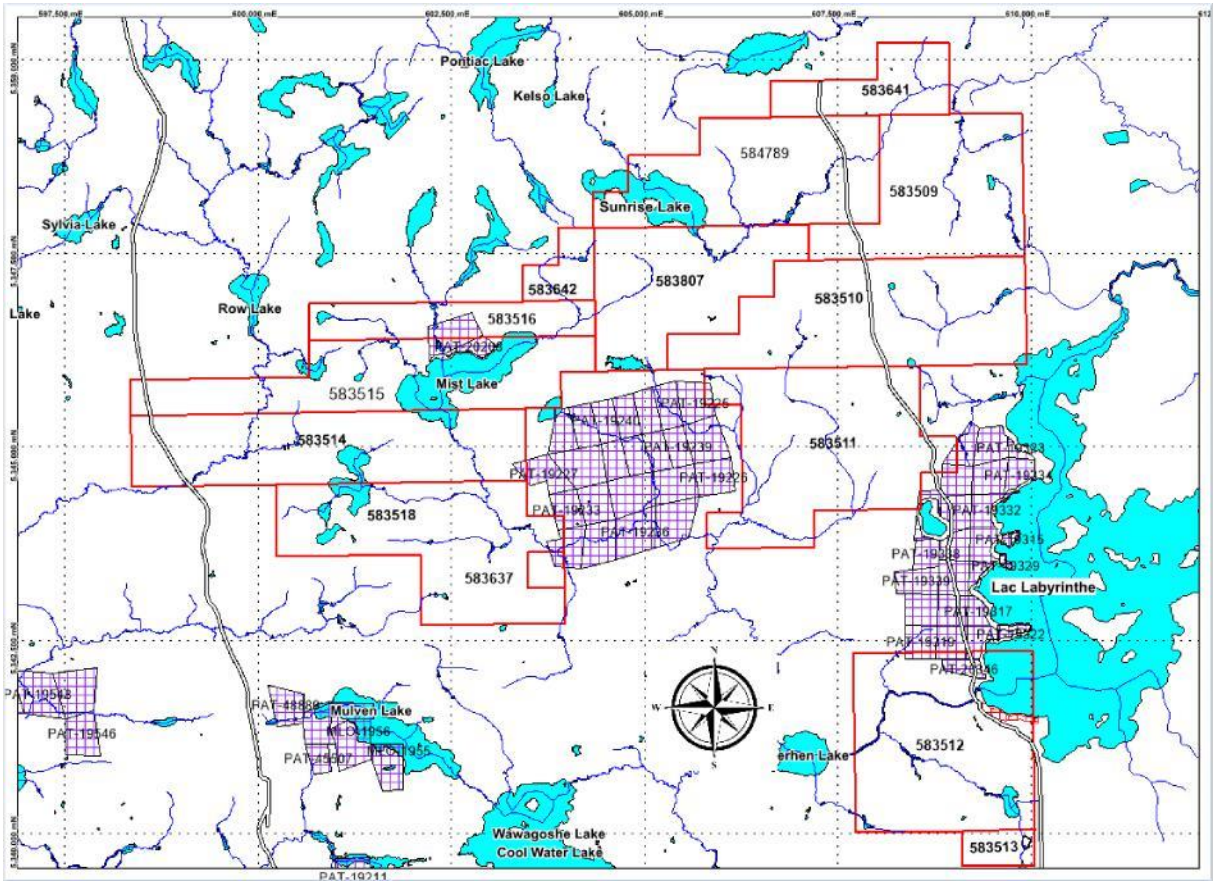


Figure 4 Property claims

Larder Lake claims outlined in red. Purple claims are patented/leased

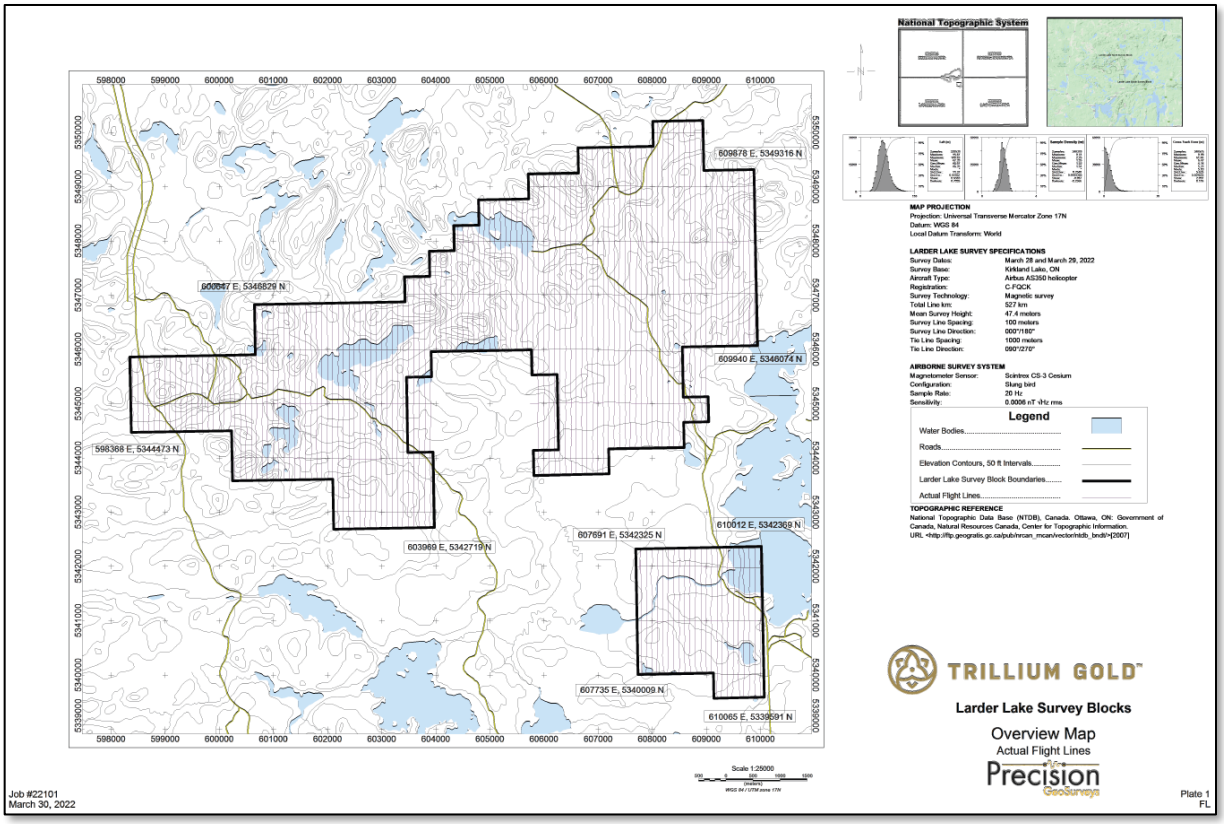


Figure 5 Claim map with flight lines

3.0 HISTORY

There is a considerable amount of data covering the TGM property and adjacent ground. exploration. On property and overlapping work is reported, completely off-property work is not.

AR 32D05SE0376 AR 32D05SE0084 AR 32D05SE0083 AR 32D05SE0082 AR 32D05SE0081 Ossian Gold Mines Ltd. ***ADJACENT & OVERLAPPING TGM PROPERTY***

A large document set covering several decades of work on some of the oldest exploration in the region, this on now patented ground flanked extending on three sides onto the current TGM north claim block. Ossian Gold Mining Co. acquired the property in 1925, later, Silver Century obtained the original claims and added others to their property portfolio, and more recently, Sudbury Contact Mines explored portions of both.

1923 report

A large 'hogs-back of white quartz traceable for 600 ft, striking 074.5° E, dipping north and south from the centre and in the north lying 'fairly flat'. ODM Map P-630 shows an E-W trending belt of acid volcanics up to '1/3 mile wide and pinching out to the west.' The rhyolite is bounded to the north and south by andesite.

The body is up to 32 ft across, with trenching indicating discontinuous quartz alternating with the andesite. Well mineralised, pyrite, minor sphalerite and galena were noted.

1924 – Dome Mines collected trench samples with grades returned form 0.097 oz Au/ton over 36 inches, to 1.1 oz Au/ton over 48 inches.

A 90 ft vertical shaft was sunk with at this depth, a cross-cut north driven for 89 ft and one south for 26 ft. By the winter of 1925, 19 holes were drilled from surface. (Crowley report – see ff).

By **1928**, a 200 ft level with about 450 ft. of development had been established.

The largest vein (the 'hogs back'), aka the Shaft vein, is traceable for 600 ft E-W, and is up to 20 ft wide, dips 45° N and extends to a minimum depth of 200 ft.

1934 A sample of dump material was sent to Noranda, with the following results: An average grade of 0.03 oz Au/ton was reported. Selected material ran 0.125 oz Au/ton and 0.12 oz Ag/ton.

In **1935-36**, more surface sampling and drilling (five holes) was completed.

1947 Minedel acquired the property.

1949 Sampling was undertaken by Paymaster Consolidated Mines, with average grades of 0.09 oz Au/ton.

An October, **1973** report by Duncan Derry of Derry, Michener and Booth for Minedel Mines summarised much of the work, and provided information only on the sampling of dumps as the trenches required mucking out.

Derry recommended ground EM surveys over the property, notably the use of Turam, and staking east and west of the Minedel claims (now TGM ground).

1969 AR 32D05SE0022 Paquette & Esberger

A VLEM survey on a claim group in northern Ossian Tp, extending into Pontiac Tp. One anomaly was located. It's "outlined by two high-frequency cross-overs indicative of overburden conductivity and correlates with a topographic low which may represent a clay-filled bedrock topographic low." No further work was recommended.

1975 April Minedel Mines contracted Barringer Research to conduct an airborne magnetometer survey of the patented claims and adjacent ground, including a portion of the northern TGM block. Line spacing was about 1/8 mile. A strongly magnetic response was noted in the east, possibly representing gabbro, peridotite or even pyrrhotite.

That year, several reports on the property were submitted by Minedel:

i) Lacombe Geological Study noted that some results from underground sampling and resulting assays were not necessarily accurate and/or representative.

ii) Lacombe reported on the results of a magnetic survey east of the patented claims, recommending stripping and (re)-trenching by exposing the old Ossian Mines trenches.

iii) An airborne magnetic survey east and west groups and the patented claims, with a portion covering current north block TGM claims.

iiii) A report submitted on ground magnetic surveying over the eastern mining claims. Follow-up using EM &/or geochemical was recommended.

v) A second geophysical report dated **1977**, on magnetometer and EM surveys over all the patented claims and 9.6-line km of surveying on contiguous unpatented claims to the east. The summary concluded the magnetometer and EM surveys "have not succeeded in detecting any mineralisation of economic interest", and their consulting geophysicist, Mr. D. Sutherland gave a second opinion, concurring with this. No follow-up work was recommended.

1977-78 AR 32D04NE0017 AR 32D04NE0018 Noranda Adjacent to TGM ground

Ground magnetic and HLEM MaxMin II surveying on claims over and adjacent to Waterhen Lake, located next to the west boundary of the TGM South block. Two 1777 Hz conductive zones, and indicative of poor conductivity (IP<OP). At 444 Hz, only one conductor is present "to any degree", and it too displays poor conductivity. They were interpreted as lake bottom sediments.

Despite that conclusion, in June 1978, a single hole, 78-1 was drilled to a depth of 419 ft. on the slightly more favourable conductor. Drilled at -38 north, it intersected dacite – rhyodacite – dacite, with the middle section hosting a 1.5 cm wide calcite-tremolite vein containing blebs of Cp and Sph, this from 330-331.5 ft., and parallel to the core axis. It re-appeared from 332.2 – 332.3 ft. Other non-mineralised quartz or carbonate veins were intersected. No assays were provided. The hole is in the ODHD and the location appears accurate to ± 50 metres.

1980-81 AR 32DNE0014 Lacana SE Claim Gp., SE Ossian Tp. TGM North block adjacent

4.66 miles of grid surveyed with MaxMin II at 1777 and 444 Hz. with 400 ft separation. Two conductors were identified and entered into GIS with the other two overburden-related. Conductor A is likely the eastern extension of the northernmost Noranda conductor, and is in an area of deep overburden. Conductor B, to the north is on higher ground with scattered outcrops, where 'trenching may be possible.

1980 AR 32D05SE0080 Lacana Ossian Tp. North Gp.

Part of their 'Kirkland Project', a September report on the geology and geophysical work on the North Gp., Grid 3. The group is a contiguous block of 27 claims adjacent to the Minedel/Ossian GML patented claims, and now within the central-east portion of the northern TGM block.

For geology, Jensen's ODM M2296 map "shows an easterly trending anticlinal structure crossing the property with a core of felsic metavolcanic rocks overlain by a thick sequence of intermediate metavolcanic rocks to the north and south. To the west of the property, the felsic volcanics contain auriferous quartz veins in sericitic shear zones at the old Ossian gold mines (Minedel property). A major north trending fault is shown to occur close to the eastern edge of the property with a large upthrow to the east." (From Lacana Assess. Report).

Nearly 11 miles of grid were cut and MaxMin II with 400 ft coil separation was run, this with 1777 and 444 Hz frequencies. Two weak conductors, A and B were located, both with easterly trend, one north of the BL, the other, south. The HEM conductor outlined by Minedel's 1976 survey would be in the same general area.

One 444 Hz weak EM conductor was defined.

From the report verbatim:

The area is generally low lying, swampy and heavily wooded with few outcrops. Resistant outcrop ridges and knolls occur in the central part of the property and commonly rise 50 feet or more above the surrounding lowlands. The ridges generally have easterly trend.

A large flat topped , south trending esker occurs in the eastern part of the property. Its sides are steep and covered by boulders of variable size, shape, and lithology.

ROCK TYPES

(Ia) FELSIC TO INTERMEDIATE FRAGMENTAL VOLCANIC ROCKS

Andesitic to dacitic tuffs, lapilli tuffs and tuff breccias occur in the central and south-eastern parts of the property. These rocks weather grey to pinkish grey and dis play variable characteristics. The lapilli tuff is commonly coarse with elongate andesite, pumice and ash fragments up to 5 cm. long set in a poorly sorted ashy matrix. Laterally, the lapilli tuffs show little variation and can be traced for long distances across outcrops. Upward, they commonly grade into finer tuffaceous units.

Carbonate alteration is evident in most outcrops. Sericitization occurs along east trending shear zones and transforms the tuffs into light green schistose rocks which commonly contain abundant disseminated pyrite.

(Ib) FELSIC METAVOLCANIC ROCKS

A small outcrop of massive rhyolitic to rhyodacitic volcanics occur north of the felsic fragmental rocks. These rocks are light grey to greenish grey on fresh surfaces and weather to a light grey or cream colour. They are hard and exhibit very little structure.

(2a) INTERMEDIATE METAVOLCANIC ROCKS

These metavolcanic rocks are light to medium green in colour, medium to fine grained and generally hard. They are predominantly massive with brecciated, amygdaloidal flow tops. Carbonate is the main vesicle filling material. Carbonate alteration locally gives the volcanics a very light brecciated flow tops. Associated sulfide (sic) mineralisation was not observed.

(2b) PILLOW LAVAS AND BRECCIAS

Pillow lavas and associated breccias occur in the northern and southern parts of the property. The pillows are light to medium green, carbonated and generally small, less than 45 cm. in diameter. The breccias are coarse with angular to sub-rounded fragments of pillow-like material up to 10 cm. in diameter.

Felsic to intermediate flows and fragmental units have very steep to vertical dips on the property. Pillows facing determinations seem to indicate that the felsic fragmental rocks (la) underlie the intermediate volcanic rocks (2a) and pillow lavas (2b).

Major shearing occurs in the felsic fragmental rocks (la) with east-west trend. The shear zones are many metres in width. Locally, where shearing is most intense, the felsic rocks are converted to sericite schists. Schistocity is parallel to sub-parallel, to the volcanic layering. The inter mediate metavolcanics (2a) and pillow lavas (2b) do not display penetrative deformation; quartz or carbonate filled tension gashes occur locally.

Pits occur 'in the pyrite rich, sericite schists in the central part of the property (Figure 3). These old pits were resampled and all samples gave less than trace values for gold.

Lacana Conclusions

Felsic fragmental rocks host auriferous quartz veins on the adjacent Minedel Mines property. These rocks extend onto the Lacana property.

Conductor B (Figure 2) occurs within the felsic sequence (2a) approximately on strike with an exposed pyrite rich shear zone to the west. Gold assays from pits in the pyrite zone were discouraging. The conductor occurs in an area where there seems to be thick overburden and could be tested by drilling only.

1980 AR 32D05SE0079 Lacana Ossian Project, Ossian Tp.

A November report on the 78 claims in Ossian Tp. The contents are a compilation of work on all their claim blocks, Kirkland, North, and the James Barnard option. Summaries are provided above and below.

1981 AR 32D05SE0078 Lacana Kirkland Project

That winter, one hole drilled, 1-81 for 535 ft in central Ossian Tp, on claims now held by TGM.

The ODHD is accurate to ± 50 metres. However, examination of the Labbé report's map suggests if the hole would be 600 m east which is improbable. The hole tested an EM conductor, possibly one previously defined by Ossian GML. Drilling intersected a range of lithologies, from andesite, lapilli tuff, tuff, tuff breccia, pillow lavas and breccias to coarser intermediate tuffs, and massive to brecciated rhyolite tuffs, bedded tuff, banded cherty tuff, siliceous tuffs, bottoming out in more andesite tuffs and breccias. No results were reported. K-spar alteration, minor silicification, qz-carbonate-(py) and blebby and disseminated py. was logged, with rare po also noted.

The submittal contains no report.

1990 AR 42F05SE0003 KEN CULHANE

Prospecting on several properties using OPAP – OP90-351, including within the main TGM block. There are three MDI locations for his work, with spatial errors and several locales missing, this due in no small part to the quality of the maps which were hand drawn with no accurate reference points.

His report notes quartz-sulphides in or close to magnetic iron formation on the south and south-east shore of Sunrise Lake, and ca. one km east, just east of an old trail, later upgraded to a logging road, the Chemenis Rd. that heads north and loops west and back south, joining Hwy 66 at Kearns. Sample locations were entered manually into GIS based on Culhane's maps and for future locating, caution is advised. Assays for Cu, Zn, Ag and Au are reported, but locations are completely unclear and the majority are from work elsewhere. Further, the three MDI's record no assays and later, Beaudoin (govt. geologist), had trouble finding anything.

1990 AR 32D05SE0001 Orofino Resources Ltd.

Exploration over a large portion of Pontiac Tp, with the southern quarter 'overlapping' onto the current northernmost TGM claims, they terminating at the southern township boundary.

Soil and rock sampling with soil collection along N-S lines every 200 m, and rock where outcrops were 'convenient'. Preliminary mapping at 1:5,000 was completed. All samples were analysed for Cu, Pb and Zn. That year, additional claims were staked, more grids cut and, in some areas, old grids re-furbished. In the fall, UTEM III surveying totalled 72-line km of vertical component

coverage from eight loops. No long wavelength, late-time anomalies were observed, indicating a deep massive sulphide body was not detected.

The general N-S strike of the geology was confirmed in the geophysics as a number of poorly conductive trends. These included several discrete conductor sources and some 'fairly extensive interface effects' (lithological contacts, 'formational boundaries' and the like).

1990 AR 32D05SE0003 Orofino Resources

MaxMin I with 220, 440, 880 and 3520 Hz frequencies and 250 m cable on a block, Grid AB. Three other blocks are shown in the report, two north of TGM ground, the third extending onto northern TGM claims. The location of this grid was entered into GIS.

Not all lines were run due to topography. No "good conductor was detected by this survey. The shape of the profiles is characteristic of a thick and/or conductive overburden layer. However, since the thickness of that layer may be related to the shape of the bedrock surface, some features could be interpreted, such as fractures and shear zones. These may produce linear depression in the bedrock surface, which, being filled with conductive material, will eventually create an anomaly in the profiles. Geological information would help to discriminate such features." The report also suggested: "From the point of view of gold exploration, shear zones and fractures being a very important factor determining the location of possible deposits, one should produce a new interpretation with the help of other geoscientific data (surface geology, DDH logs, etc), considering that such features are likely to imprint on the overburden layer. Consequently, overburden effects may have, possibly, some structural significance."

Below, Orofino compilation map, with geology, UTEM conductor axes, and drilling. The mapping suggests limited outcrop and/or mapping over the TGM claims, with only broad lithological classification, and no alteration specifics, unlike the majority of their property. There are a couple of UTEM conductors trending south onto TGM ground, located in the north-east, one of which (red dot) is annotated as having been drilled at its southern termination. The UTEM map within the report indicates the hole number is 90-1, and drilled by Orofino. The two other drill holes annotated on the map tested conductors to the north, off property.

1992 Crow Geological Services Inc. acquired the 23 patented Ossian claims.

1993 AR 32D05SE0060 Rio Algom Orofino Option

Rio optioned the property, which in 1993, comprised 137 claim units. Only the southernmost portion of their work overlaps with TGM ground, but a geology map is included, below. HLEM surveys were run but no significant conductors were located. The focus was farther north-east of Death Lake, where four holes were drilled.

"The stratigraphy on the Orofino ground is partially obscured by a large esker and an extensive subvolcanic intrusive. The stratigraphy is disrupted by a series of northeast-trending faults. Hydrothermal alteration along the dacite-basalt contact along the southwest part of the property

continues northward to the Pontiac Creek Fault North of the fault, towards Death Lake, hydrothermal anomalies and associated weak copper and zinc anomalies are scattered and associated with felsic flows and breccias surrounding the QFP. The southern extension of Cu-Zn mineralisation (as occurs near Death Lake) does not appear to continue at the depth tested in drill hole OR-93-01. Negligible hydrothermal alteration was intersected in this hole."

On an area termed Grid 3, small grids for HLEM and mag' were cut across an area, east of Kelso Lake east to the Cheminis Rd. There are no GIS co-ordinates and clearcutting in the east means it's unlikely anything will be preserved. The work is reported as on Grid 3, Project 9211 by the operators, Val d'Or Geophysics.

Results and conclusions within the report, namely weak but shallow, short, generally N-S striking (ed.-?-contact or formational) bedrock conductors are not necessarily indicative of the prospectivity on the TGM ground. IP was recommended as follow-up. Below, geology map with TGM boundary in red.

1992 AR 32D05SE0076 Boudreault Property

VLF and magnetic surveys by Services Exploration. on a N-S oriented grid. Work was in part funded by OPAP. Work was of a reconnaissance nature with no correlation to geology or ground checks. The property lies on the west shore of Labyrinth Lake, immediately north and west of the patented claims, extending onto the eastern portion of TGM north block ground.

1996 AR 32D05SE0375 Labbé Property OPAP

As preceding property. Pascall Labbé submitted a compilation map of past work on claims extending west from the Labyrinth Lake shoreline, onto TGM main block claims. Locations for Lacana hole 1-81 and trenches are considered to be of poor accuracy.

1993 AR 32D05SE2001 Phil Rivard Katrine Block B

A report by S.J. Carmichael on Rivard's Block B, east contiguous with the much larger 21-unit block held by Rivard. A magnetic feature was drilled but 'failed to intersect kimberlite, and the anomaly appears to be a contact from a non-magnetic diorite to a slightly magnetic andesite unit." The target was in part based on 1979 till sampling by Long Lac Minerals. Work was funded by OPAP.

The larger block to the west has considerable history, with drilling by several companies. Targets included the Little Misema Creek/River Fault, an offshoot of the KL-LL Break.

1993 - 1994 AR 32D05SE0091 Ossian Gold Prospect, Randy Crowley 1994 OPAP Final report, file # OP93-713

Continuation of work on the old Ossian GML property, with linecutting, VLF, HLEM (MaxMin II), and ground magnetometer surveying in December, 1993. Work was over the shaft, east and westwards over presumed mineral/vein extensions.

A single quadrature response from the MaxMin is co-incident with a strong VLF conductor.

1993 AR 32D04NE 0095 Sudbury Contact Mines Ltd. South Property, Ossian Tp.

Sudbury Contact took an option on the Ossian GML property and as part of a separate deal, the Labbé property to the east and south. The Boudreault-Labbé claims are now patented.

From the same report and AR 32D05SE2003, a summary history of the Ossian Gold Mine was provided.

> ***1926-1927*** *Ossian Gold Mines Limited: A shaft was sunk to a depth of 210 feet for underground development of the gold bearing quartz zone. Levels were established at 90 and 200 feet depths with 600 feet and 450 feet of drifting on those levels respectively. On the 90 foot level, 480 feet of the lateral development was completed along the quartz zone.*
>
> *Underground sampling of the quartz zones returned gold values up to 0.126 oz Au/ton.*
>
> ***1925*** *Ossian Gold Mines Limited: Trenching and surface diamond drilling were conducted on the gold zone. The drilling program consisted of 19 holes totalling 5,421 feet. Gold values from the drilling ranged from trace to 1.64 oz Au/ton. The best composite gold intercepts were from Hole #7 and Hole #9 which returned 0.84 oz Au/ton over 10.7 feet and 0.698 oz Au/ton over 10 feet respectively (Morrison J.W., 1926).*
>
> ***1928*** *Ossian Gold Mines Limited: P.E. Hopkins was contracted to carry out independent underground sampling of the workings. On the 90 foot level, the best underground sample was 0.08 oz Au/ton over 4.6 feet while on the 200 foot level it was 0.125 oz Au/ton over 3.5 feet. Hopkins also retested drill core from the surface drilling. Gold analysis indicated lower second cuts than the original first cuts.*
>
> ***1928*** *Ontario Division of Mines: T.L. Gledhill carried out a large reconnaissance geological survey of mainly the Ben Nevis area which included the Ossian Gold Mine Property.*
>
> ***1934*** *Ossian Gold Mines Limited: Dump material was sent to Noranda for testing and averaged 0.03 oz Au/ton and 0.02 oz Ag/ton. Selective dump material returned 0.125 oz Au/ton and 0.12 oz Ag/ton (Derry, 1973).*
>
> ***1935-1936*** *Ossian Gold Mines Limited: A short diamond drilling programme of five holes was conducted to check the original holes 3, 5, 6, 7 and 9. The best result was 0.38 oz*

Au/ton over 2.8 feet from hole 5A. The other four holes failed to return significant gold values and verify the original holes (MacGregor J.G., 1936). This would suggest either an analytical problem or erratic gold mineralisation.

1939 *Sylvanite Gold Mines Limited: A surface examination of the trenches was conducted in 1938 by K. Heisey. A channel sample returned 0.63 oz Au/ton over 4 feet, 15 feet west of the shaft. K. Heisey recommended the old trenches be stripped clean and further cross trenching be conducted.*

1947 *Minedel Mines Limited: The Ossian Gold Mine Property was acquired from Ossian Mines Limited for 109,500 shares.*

1947-1948 *Geological Survey of Canada A regional aeromagnetic survey was conducted over the Larder Lake area which included the Ossian Gold Mine Property. At the same time, J.B. Currie completed a geological survey covering Ossian Township.*

1949 *Paymaster Consolidated Mines Limited A surface geological examination was completed on the property by C.S. Longley. Sampling of the old trenches returned gold results up to 1.47 oz Au/ton over 2 feet. A total of 13 grab samples were taken from the quartz shaft dump. The arithmetic average grade of the dump was calculated to be 0.09 oz Au/ton. The quartz shaft dump was estimated to contain 1,055 tons of material (Longley, 1949).*

1970 *Ontario Division of Mines: L.S. Jensen completed a geological survey covering*

1973 *Minedel Mines Limited: The company contracted Derry, Michener and Booth Consultants to review historical data and examine the property. D. Derry recommended ground geophysical surveys over the property followed by diamond drilling if favourable geophysical results were obtained. He proposed the exploration program focus on the potential for base metal mineralisation in the felsic package.*

*In **1975**, Barringer Research Limited on behalf of Minedel Mines conducted an airborne magnetic survey over the Ossian Gold Mine Property and the western half of the Boudreault-Labbé Property. This work was reported by P.G. Lacombe and is the earliest assessment work recorded on the property. He concluded that the old underground sampling and diamond drill results were unreliable and that results from surface sampling by Sylvanite Mines and Paymaster Consolidated verified older sampling. He recommended that the quartz zones be channel sampled and a bulk sample taken of the quartz dump. If the results were favourable then a diamond drilling program should be considered.*

The airborne magnetic survey outlined three east-west linear anomalies and two broad north-south anomalies, likely a result of slightly magnetic volcanic stratigraphy. A sharp low magnetic intensity area was located along the western boundary of the property (Lacombe, 1975). This may represent a north-south trending fault structure.

As a follow up to the airborne magnetic survey, Minedel Mines had ground magnetic survey showed the area to be flat magnetically and was not able to discern between the felsic and the intermediate volcanic sequences. This survey did not cover the airborne low magnetic intensity area. The electromagnetic survey did not detect any good strong conductivity which could be considered representative of sulphide mineralisation (Phelam, 1977). No further work was recommended on the western portion of the Boudreault-Labbé Property by L.G. Phelam. Minedel Mines allowed their option on these unpatented claims to lapse.

In 1979, an Ontario Geological Survey airborne electromagnetic and total intensity magnetic survey by Questor Surveys Limited was flown over Ossian Township. No geophysical anomalies were detected over the Ossian Gold Mine Property.

*In **1980**, Lacana Mining Corporation held 21 unpatented mining claims (339.95 hectares), west of the Labyrinth Lake Road on the present-day Boudreault-Labbé Property (see below). Geox Ltd. conducted a ground APEX Max Min II horizontal loop EM survey over the Lacana claim block. This EM survey discovered two weak east-west conductors (1777 Hz.). Subsequently, the claim block was mapped by Lacana personnel. The mapping indicated a felsic to intermediate fragmental sequence north of and underlying an intermediate massive and pillowed sequence. Several old pits sunk on pyritic sericitic schists in the felsic to intermediate fragmental sequence were sampled. Only three rock samples were collected and gold results were less than 25 ppb. Au (Wells R.C., 1980).*

One of the two EM conductors was found to occur in a deep overburden area west and along strike of the pyritic pits in the felsic to intermediate fragmental sequence. This EM conductor target was drilled in 1981. Lacana Hole 1-81 is presently stored in the Kirkland Lake MNDM drill core library and was relogged by the author of this report (see Property Geology). Lacana Mining did not file any assay results from Hole 1-81, although several core samples were taken. The results were likely low as Lacana did not continue work on the claim block past 1981.

***1992** Crow Geological Services Inc.: The Ossian Gold Mine patented claims were acquired.*

***1992** A Geological Survey of Canada airborne magnetic and electromagnetic survey by Geoterrex Ltd. was completed over Ossian Township as part of the Blake River Syncline Project. The airborne magnetic survey is relatively flat with a series of lows defining a north-south fault at the eastern boundary of the Ossian Gold Mine Property. The airborne electromagnetic survey did not detect any bedrock conductors on the Ossian Gold Mine Property.*

***1993** Crow Geological Services Inc.: A small grid of 8.65-line kilometres was cut centred about the old mine shaft. Lines were cut 100 m apart from 600W to 800E and stretched*

250 m north and south of the 1.4 Km baseline. Ground magnetic and VLF-EM surveys were completed over the grid.

The magnetic survey showed a series of linear ENE trending anomalies of low amplitude, which corresponds to volcanic stratigraphy. The VLF-EM survey outlined nine conductors ranging from moderately strong to extremely weak in strength. The most significant conductor (A) stretches from L200W to L800E between 100S and 200S. This conductor was thought to be a sulphide bearing unit. A second strong conductor (H and D) cross cutting the grid at a low angle was postulated to be a shear. This second conductor extends from L600W to L500E (Crowley, 1995).

On February 1, 1996, Crow Geological Services Inc. optioned the patented claims of the former Ossian Gold Mine to Silver Century Explorations Limited.

Boudreault-Labbé property work history (also from the Sudbury Contact report)

The claims covered eastern portions of the main TGM block, extending south and east onto patented claims extending to the shores of Labyrinth Lake, so some data is directly relevant, others by inference, deduction, or analysis.

*The earliest geological information on the Boudreault-Labbé Property is from a reconnaissance geological survey completed by Cyril W. Knight of the Ontario Division of mines in **1919**.*

*In the early **1920**'s, a gold bearing quartz zone was discovered on the Ossian Gold Mines Property adjoining the west boundary of the Boudreault-Labbé Property. At the time, it is quite likely that geological work and prospecting was conducted on the Boudreault-Labbé Property to search for the eastern extension of the gold bearing quartz zone. However, none of this work is recorded in the Kirkland Lake Resident Geologist's office.*

*In **1928**, T. L. Gledhill of the Ontario Division of Mines completed a reconnaissance geological survey over the Boudreault-Labbé Property. More detailed government geological surveys were conducted by the Geological Survey of Canada from 1947 to 1949 (Currie, 1950) and the Ontario Division of Mines in 1970 (Jensen, 1975).*

Barringer's survey over the property (see above) resulted in cursory ground work with recommendations for no further work.

In the early 1990's, Mr. Bernard Boudreault staked claims 1185861 to 1185863 covering the present-day Boudreault-Labbé Property. He cut an imperial north-south grid (400 foot line spacing) over the entire property. This grid has formed the base for subsequent exploration surveys. In 1992, Mr. Boudreault contracted Services Exploration to conduct ground geophysical surveys over the eastern half of the property. Service Exploration

carried out 21.24 line kilometres of magnetic and VLF-EM surveys (Chartré, 1992). These surveys covered from line 3960E to line 2400W in the west.

Between 1992 and 1995, Mr. Bernard Boudreault along with Mr. Pascal Labbé re-staked the above claims and formed the Boudreault-Labbé Property. Further ground magnetic surveying was completed by JVX Limited in 1995. A total of 15.77 km was surveyed along lines from line 3200W to line 6800W. In addition, 4.70 line kilometres of time domain spectral induced polarization and resistivity surveying was conducted on four grid lines (Webster and Savic, 1995).

On February 23 1996, Mr. Bernard Boudreault and Mr. Pascal Labbé optioned their mining claims to Silver Century Explorations Ltd.

Sudbury Contact work:

1995-96 VLF and ground magnetic surveys with complete mag. coverage of the property. Spectral IP and resistivity surveys at 800 ft line spacing were completed on the property by JVX. Seven chargeability 'anomalies' were delineated.

Magnetic data is in accordance with other programmes across the area, noting quite low/weak/ flat signatures. A N-S trending mag. high under the Boundary Esker may represent a buried dyke.

1995 RC drilling up to 1.5 km south of the TGM main block, and extending to just within the southern portion of it, extending W, and E, off TGM property. The programme targeted diamonds and gold, having expanded on earlier drilling of kimberlite north of the Larder Lake highway, and the company's initial gold exploration that culminated with the discovery at Victoria Creek. A total of 17 holes ('SO-*) were drilled in the winter, on three claim blocks covering 760 acres. Data is in the Ontario DHdb and the Abitibi till database. Conclusions are provided below.

"1) Total kimberlite indicator mineral counts are generally non-existent (sic) throughout the property. Two separate reverse circulation drill holes, SO-95-01 and SO-95-11A, contain a kimberlite indicator mineral count of one and three grains respectively. These results can be considered negligeable (sic); suggesting the presence of no kimberlites in the immediate area up-ice of the S property.

2) Gold grain counts found throughout the property are characterized by reshaped and modified gold grains. Sampled material in four separate reverse circulation drill holes, SO-95-03, SO-95-08, SO-95-10 and SO-95-11A, recovered from one to three pristine gold grains along with modified and reshaped grains.

However, the high proportion of modified and reshaped gold grains found in the same material suggest a distal gold source > 10 km).

The gold grain results obtained on the property reflects the background gold grain count in the till of the area and a possible distal gold source >10 km).

3) Geochemical results obtained from the tills do not show any anomalous results in base metals which would suggest any deposits of this type."

Silver Century recommendations

"The results obtained during the reverse circulation drilling program executed on the south property warrants no further work to be undertaken on this property."

The report contains no other information on grain shape, attempts to define dispersion trains, no surficial geology maps or interpretation. The majority of holes drilled into and through basal or modified till. Graphic drill logs indicate several metres of varved till overlying thicker fluvioglacial and lacustrine sediments above basal or re-worked till. Ablation and re-worked till may be 'sandwiched' between sediments, clearly indicating their erosional nature. Bedrock was from 25 to over 50 metres, with interfaces of boulders, till, re-worked till, sand or s.l. fluvioglacial sediments.

The report provides relatively recent descriptions of the property geology, a map providing locations of the RC holes, indicating scattered outcrop, but little structural information. It's possible some holes can be located if the area has not been clear cut.

There were recommendations for the drilling of three shallow holes targeting favourable Spectral IP responses from programmes run in 1995-96:

"The proposed drill holes are as follows:

1. *L7200W/225N* -50 dip, 360 azimuth, 200 m length

High chargeability target L7200W/500N (TH3). No outcrop on line L7200W in this area, however on L6800W at 375N there is a felsic ash-crystal tuff/mafic pillowed flow contact with a pyritic silicified sericitic shear along the contact. Chargeability target however appears north of this shear and the contact.

2. *L400W/300S* -50 dip, 360 azimuth, 275 m length

High chargeability target L400W/BL (TH1). No bedrock exposure and possible deep overburden greater than 50 m. High resistivity/Low resistivity contact area. This target may be linked with L400E/600N (LH1) target if it is a northeast trending structural or mineralised zone.

3. *L400E/1200N* -50 dip, 360 azimuth, 200 m length

High chargeability target L400E/1400N (TH2). No bedrock exposure but topography indicates possible subcrop beneath the target area so shallow overburden expected."

"Geological mapping and whole rock geochemistry has confirmed the presence of a 4 km long felsic ash-crystal tuff belt on the property. This belt hosts the Ossian Gold Mine Showing, located 1.5 Km east of the Boudreault-Labbé Property. On the property the belt is approximately 300 - 500 m wide and contains several silicified, sericitic shears with very finely disseminated pyrite. Strong potassic and silica hydrothermal alteration has been observed in the belt, on the property. The presence of pyritization, hydrothermal alteration and shearing within this belt are good indications for the existence of a pyritic gold deposit on the property." From the assess. report.

1996 AR 32D05SE0100 Umiljendic Property, Ossian Tp.

Mag. and VLF over 7.8-line km on claims between Mist Lake and SE to the Ossian GML patents, and so within the main TGM block. The work report was written by S.J. Carmichael.

1996 AR 32D05SE0101 Silver Century, Labbé/Boudreault Option, Ossian Tp. Project 54

Exploration east of the patented claims, and on current TGM property. Magnetic, VLF, Spectral IP (Scintrex IPC-7/2.5 kW TD transmitter and IPR-12 TD receiver.

"In 1996, IP/Resistivity coverage was 14,528 metres, magnetometer coverage was 7.422 metres, and VLF-EM coverage was 25,131 metres. This 1996 geophysical work has been merged and compiled along with the 1995 JVX work and the 1992 Service Exploration work, at the request of Silver Century Explorations Ltd. The 1992 and 1995 geophysical work has already been filed for assessment credit."

The gridding suggests extending geological and geophysical knowledge eastwards from the Ossian GML ground, and with step-out, reconnaissance grids farther east. IP Pseudosections and maps of magnetic and VLF data are in their report.

Several Target Areas for further exploration were identified and prioritized.

1996 AR 32D05SE2004 Silver Century Explns. Ltd. Boudreault-Labbé Property, Ossian Tp.

By that year, the Property formed part of the Ossian project, consisting of 10 unpatented mining claims and 23 patented claims.

A **1996** Geology report on the option, with property-wide mapping and whole-rock geochemistry "confirming the presence of a 4 km long felsic tuff belt on the property. "Strong potassic and silica hydrothermal alteration, pyritization and shearing has been observed in the felsic belt." Three short holes were recommended based on the geophysical surveys by JVX (see above – ed.). Outcrop is scarce and limited to isolated knolls and ridges. Drainage is poor, with second and third order vegetative growth.

A total of 52 rock samples were taken, with 18 of these from bedrock RC samples Most if not all were analysed for whole rock and multi-element geochemistry. Fairly detailed descriptions of the geology are provided and match those underlying the SO property, south-adjacent. Lacana hole 1-81 was re-logged. The 535 ft. long hole tested an EM conductor in 1981. Results were negative.

JVX Limited outlined seven spectral IP chargeability anomalies in 1995 and 1996 on the property. Five of these anomalies are located within or very proximal to the central felsic tuff belt. They could represent a pyritic gold deposit. None of these IP anomalies has ever been drilled on the property. In fact, only one drill hole (1-81) has been drilled on the property according to assessment records.

A short diamond drilling programme (three holes totalling approximately 675 m) was recommended to test three of these chargeability anomalies. The three selected drill targets have high MIP values and are interpreted to be sulphide mineralisation zones. The proposed drill holes are as follows:

1. *L7200W/225N* -50 dip, 360 azimuth, 200 m length

High chargeability target L7200W/500N (TH3). No outcrop on line L7200W in this area, however on L6800W at 375N there is a felsic ash-crystal tuff/mafic pillowed flow contact with a pyritic silicified sericitic shear along the contact. Chargeability target however appears north of this shear and the contact.

2. *L400W/300S* -50 dip, 360 azimuth, 275 m length

High chargeability target L400W/BL (TH1). No bedrock exposure and possible deep overburden greater than 50 m. High resistivity/Low resistivity contact area. This target may be linked with L400E/600N (LH1) target if it is a northeast trending structural or mineralised zone.

3. *L400E/1200N* -50 dip, 360 azimuth, 200 m length

High chargeability target L400E/1400N (TH2). No bedrock exposure but topography indicates possible subcrop beneath the target area so shallow overburden expected

1996-97 AR 32D05SE2009 Silver Century Explns. Ltd. Ossian Gold Mine Project

Winter 1996 and Winter 1997 RC drilling on the Boudreault-Labbé patented claims. The locations are in the ODHD.

Located in the ENE of the TGM main ('north') block, the report describes previous work not in the Ontario Assessment Report 'system'. The earlier RC drilling was reported by Toth, 1996 (AR 32D05SE0103)

"Silver Century Explorations Ltd. is involved in the exploration of a large group of claims in Ossian Township. A Reverse Circulation (RC) drill program was conducted between February 28 and March 5, 1997, on claims nos. 1203476 and 1203477 of Project #54 and claim no. 1211637 of Project #56.

A RC drill program was conducted in March **1996** (Toth, 1996). RC drill hole OS96-24 returned significant pristine and modified gold grains. A follow-up till and esker pit sampling program conducted during the summer of 1996 (Montgomery, 1996) yielded inconclusive results due to poor exposure of sample media. Montgomery observed a possible northeast trending structure north of OS96-24 and an IP target immediately north of the hole. He recommended follow-up RC

drilling to (1) test immediately down-ice of the structure (all holes), (2) bracket the 1996 RC hole and thereby judge the possible width of the gold grain train (holes l, l A & 3), and (3) test the DP anomaly (hole 2). Two holes (4 & 5) were drilled north of OS96-24 to obtain a cut off.

Three holes were drilled on the Project #54 property. A total of two possible till and 12 sand and gravel samples were obtained from Holes OS97-1 and l A, neither of which reached bedrock and were terminated early due to difficult drilling conditions. Two pristine, two modified and 29 reshaped gold grains were obtained indicating a distal source. Hole OS97-3 drilled east of the 1996 hole provided two till samples which contained two modified and two reworked gold grains. An intermediate crystal tuff was intersected at the bottom of hole OS97-3. Three holes were drilled on the Project #56 property. A total of four till samples were obtained from OS97-2,4 & 5. Very low background values were obtained in all three holes. Intersected bedrock in these holes was intermediate crystal tuff or massive fine feldspar porphyritic flow.

Results of Holes l and l A are inconclusive since bedrock was not intersected and a reliable representative sample medium was not obtained. The holes were drilled near the centre of the esker complex. The results of Hole 3 demonstrate that no significant gold system exists immediately north of this location and cuts off the anomaly to the east. Hole 2 failed to explain the IP anomaly and was possibly drilled too far north (their conclusions). Holes 4 and 5 contained very low and zero gold grain counts and therefore act as a northerly cut off to the OS96-24 anomaly. *The IP anomaly is still a viable target.*

The results of Hole OS96-25 located 500m west of Hole OS96-24 noted highly anomalous gold grain counts. The source of the gold counts obtained in 1996 may possibly explain the IP target if it trends westerly and north of hole OS96-25.

Bracket RC drilling to the east and west as well as the north was recommended. A line of IP may be necessary between Holes OS96-25 and 20 to cover the projected west direction of the current anomaly. If the north hole gold grain counts are significantly reduced and the IP trend continues west between the north holes and OS96-25, then a diamond drill program should be conducted to test the IP target in at least two places."

Overburden depths in this area are generally deeper than to the west, with deposits more closely related to the Boundary Esker that runs N-S in the immediate area. Most RC holes drilled through thick sequences (30-45 m) of gravels below fine sand, silt and clay beds, pebble and gravel beds before intersecting boulders, cobbles, broken bedrock. Several holes were abandoned.

1996 AR 32D05SE0102 Silver Century Explns. Ltd. Ossian Gold Mine Property, Project 53

Magnetic, VLF, Spectral IP (Scintrex IPC-7/2.5 kW TD transmitter and IPR-12 TD receiver), and resistivity surveys over the patented claims. Targets were precious and base metals. The programme essentially mirrored that on the Boudreault- Labbé property completed earlier that year. TGM ground is partly overlaps, and is N,W, and E adjacent. Within the report are brief summaries of the IP results as follows.

"IP-1, IP-2. VLF-1 and VLF-2:

"These chargeability zones extend across the central part of the grid. Spectral tau values are primarily long indicating coarse-grained or linked sulphides. Apparent resistivity values are mainly low in these areas typical for conductive sulphides. VLF conductor axis *VLF-1* supports this interpretation since it generally coincides with these long-time constant anomalies within *IP-1.* The symmetrical shape of *VLF-1* suggests that it is likely the result of a near vertical body.

"Individual anomalies along these chargeability zones (e.g., *IP-1* at L500W and L700W, and *IP-2* at L500E - see Compilation Map) with short time constant tau coincide with high MIP values indicating a relatively large number of fine-grained sulphides. Apparent resistivity high anomalies, indicative of silicification, coincide with these short time constant anomalies.

"IP-1 and *IP-2* chargeability zones primarily coincide with magnetic low zones and are flanked by minor magnetic high or background level zones. Apparent resistivity high anomalies generally coincide with magnetic low zones throughout the survey area. Therefore, it is likely that the low magnetic and high apparent resistivity values obtained through *IP-1* and *IP-2* are a result of a more felsic rock with relatively non-magnetic sulphide mineralisation.

"IP-3 is a 'wish-bone' shaped chargeability zone located north *of IP-1* and *IP-2,* and between relative magnetic high zones identified on the Compilation Map as *Mag-1.* The spectral parameters MIP and tau are moderate (O 00 mV/V) and short respectively. The peak of the anomaly source ranges from n=1 (near surface) on L500E to n=4 (relatively deep) on L1300E and L8800W (Imperial grid). Unlike *IP-1* and *IP-2* where short time constant tau anomalies coincide with high apparent resistivity anomalies, *IP-3* anomalies coincide with low apparent resistivity anomalies (e.g., L700E and L1300E). *IP-3* is likely the result of fine-grained sulphides with less silicification compared to short time constant anomalies *m IP-1* and *IP-2.*

"IP-4 is a relatively narrow anomaly, located in the northern corner of the survey grid. It branches out towards the southwest. Spectral MIP are relatively low (<175 mV/V) in the northeast part of the zone and relatively high (>4OO mV/V) in the northwest arm. They are all near surface (n=1) except on L900E where the anomaly is located relatively deep (n=3). A magnetic high zone also coincides with the zone on L900E. The southwest-northeast trending branches *of IP-4* are sub-parallel to VLF trends indicated on the Compilation Map. Whether there is a geologic or topographic relationship between the VLF and IP anomaly sources is uncertain. *IP-4* is typical of varying amounts of fine-grained sulphides. It may also be associated with silicification on L1300E where apparent resistivity values are very high."

IP-5:

"This short IP chargeability zone is located southwest *of IP-4.* It consists of relatively high MIP and short time constant anomalies. Apparent resistivity high anomalies are located in the east part (L100E), northwest side and south side of the IP zone. Magnetics data are weakly above background as expected for the mafic volcanics. A VLF trend that passes through the IP anomaly is likely a result of swamp effects. *IP-5* is typical of fine-grained sulphides.

"IP-6 is a very weak and narrow chargeability zone located in the southern part of the grid. Spectral MIP values are less than 100 mV/V and time constants are short. This zone contains very minor fine-grained sulphides. *VLF-5* is a poorly defined sub-parallel east-west trending conductor axis that may extend eastwards beyond L8400W (Imperial Grid). *VLF-6* is a poorly defined east-south-east extension of *VLF-5* at L100W. *IP-6* is located in an area of below background magnetometer values even though geologic mapping indicates that the area consists of mafic volcanics. This suggests that much of the magnetic mineralisation may have been 'washed-out' of the rock. *IP-6* may consist of secondary mineralisation indirectly related to the VLF conductors. The VLF anomalies may be associated with shear zones or geologic contacts that contain conductive materials."

Several targets were recommended for drilling, the highest being:

HIGH PRIORITY

T-H1 (LSOOW/stn.lOOS). T-H2 (L100Elstn.25S). T-H3 (L700Efstn.25S-100S). T-H4 (LlOOW/stn.Q-lQQS):

These high priority chargeability targets are located within IP *zone IP-1.* MTP values are over 400 mV/V and spectral tau values are short making these ideal gold exploration targets."

1997 AR 32D05SE2003 Silver Century Explns. Ltd. Ossian Gold Mine Property, Project 53

Geological mapping and sampling. detailed surface geology (5 ft x 3 ft map), detailed geology of the mine area and shaft, detailed trenches geology and sampling.

1996 AR 32D05SE0103 Silver Century Explns. Ltd. Ossian Gold Mine Property, Projects 354 & 356

A **1999** report on winter, **1996** RC Drilling with 29 holes drilled, spaced 500 m. apart. Locations were in part predicated on sampling thick overburden. 212 samples of glacial till material and 28 bedrock chip samples were taken for analysis.

Depths to bedrock are around four to 40 metres, with most holes drilling through silt – fine sand, interbedded thin clay beds, coarser sand and gravel, lag beds, and highly variable thickness (1-6 m), sandy, cobbly, moderately to strongly compacted, moderately to poorly sorted till.

Holes OS-96-24 and 26 appear to have elevated pristine and modified gold grain counts per kilogramme of sample suggesting a proximal to intermediate source. The geochemical analysis or the results from Activation Laboratories of the heavy mineral concentrates of hole OS-96-25 showed an elevated Mn and Cu assay of approximately 1200 ppm and 102 ppm respectively. The geochemical analysis and the bedrock chip sample analysis returned no significant anomalies with the exception of the above-mentioned hole.

A programme of infill till pitting and geological mapping was recommended in order to complete the till survey and to better define the source or sources for the elevated gold grain counts, in holes OS-96-24 and 26. The drilling is in the ODHDb.

1997 AR 32D05SE2010 Silver Century Explns. Ltd. Boudreault-Labbé Property, Ossian Tp.

In the winter, "a short reconnaissance diamond drilling program consisting of four holes totalling 691 metres was conducted on the Boudreault-Labbé Property in early 1997. The drilling tested three of the high chargeability anomalies for auriferous pyrite mineralisation.

"Results were discouraging with no significant gold mineralisation being encountered in the diamond drilling. Further gold exploration on the property is not recommended at this time.

"Hole BL97-2 intersected two encouraging pyritic sections within hydrothermally altered felsic stratigraphy. The stringer network style of the pyrite mineralisation and its host lithology are good indicators for base metal mineralisation. Recommended work on the Boudreault-Labbé Property should thus be focussed towards base metal exploration."

Their summary:

"No significant gold mineralisation was encountered in the 1997 diamond drilling on the Boudreault-Labbé Property. The majority of gold values were less than 5 ppb. Au with the highest assay being 99 ppb. A follow-up Reverse Circulation drilling program (Knowles, 1997) on the property failed to indicate elevated gold grain counts adjacent to and north of the anomalous hole OS96-24 (Toth and Christie, 1996). The negative gold results from these two drilling programs suggest limited potential for a pyritic gold deposit.

"Further gold exploration on the property is not recommended at this time.

"Diamond drill hole BL97-2 did intersect two encouraging pyritic sections within hydrothermally altered felsic volcanic stratigraphy. The stringer network style of the pyrite mineralisation and its host lithology are good indicators for base metal mineralisation. Further work on the Boudreault-Labbé Property should thus be focussed towards base metal exploration.

"It is recommended that preliminary geochemical and petrographic analytical work be carried out on the felsic volcanics in hole BL97-2. The geochemical analytical work should include base metal (Cu, Zn, Pb S Ag), whole rock, multi-element and rare-earth element analysis. The petrographic analytical work recommended is select thin sections of the felsic units in the hole and polished sections of pyrite mineralisation. In addition, the altered intermediate flows that contain graphitic horizons in hole BL97-3 are also recommended for geochemical analysis.

"If this geochemical and petrographic analytical work indicates the potential for base metal mineralisation on the Boudreault-Labbé Property then detailed geological mapping and deep penetrating geophysical surveys are suggested."

1997 AR 32D05SE2010 Silver Century Explns. Ltd. Ossian Gold Mine Property, Ossian Tp.

In the same report as drilling on the Boudreault-Labbé property, diamond drilling on the Ossian patented claims.

“A short reconnaissance diamond drilling program of six holes totalling 1,390 m was carried out in early 1997. Four holes totalling 1,094 m tested targets within the high chargeability anomalies and the other two holes (296 m) tested the auriferous quartz zones at the Ossian Gold Mine Showing area. The best gold results were 4.59 gpt. Au over 2.72 m and 1.12 gpt. Au over 6.15 m from the quartz zone at the Ossian Gold Mine Showing area. These intercepts are encouraging; however, they show limited potential economically. Diamond drilling did intersect a major pyrite horizon which extends for 2.2 Km on the property, however no significant gold mineralisation was encountered. Therefore, little potential for pyritic gold mineralisation exists on the Ossian Gold Mine Property. Further gold exploration on the property is not recommended at this time.

“The major pyrite horizon, consisting of 3 to 15 % very fine-grained brownish pyrite disseminations and stringers, is hosted by rhyolitic volcanics near the contact of andesitic volcanic flows. This pyrite horizon setting is analogous to the setting of the base metal deposits in the Noranda Camp. Further exploration on the Ossian Gold Mine Property should thus be focused towards base metal exploration. Preliminary work should include base metal, multi-element geochemical, whole rock and petrographic analysis of drill core in the felsic belt.”

The 1996 geophysical work outlined two strong and extensive (1.6 km long) high chargeability anomalies known as IP-1 and IP-2 in the central felsic tuff belt (Mihelcic and Webster, 1996). These high chargeability anomalies along with the favourable hydrothermal alteration and pyritization suggested the felsic tuff could host a pyritic gold deposit. The economically significant surface gold sections of 8.18 gpt. Au/4.2 m, 4.32 gpt. Au/2.7 m and 3.0 gpt. Au/3.9 m from the Ossian Gold Mine Showing suggested the showing area would be a good site for a quartz lode gold deposit.

A diamond drilling programme of six holes totalling 1,390 m to test these possibilities was carried out from February 12 to March 6, 1997.

Four holes (1,094 m) tested targets in the high chargeability anomalies which had MIP values over 400 MV/V and short spectral tau values (Mihelcic and Webster, 1996). These chargeability characteristics are indicative of fine-grained sulphide mineralisation. The other two holes (296 m) tested the auriferous quartz zones at the Ossian Gold Mine Showing area.

These lie within the patented claims. No GPS information was provided. A geology map with DH locations is also available, as are sections. Below, a summary map of 1996 RC drilling including on (now) TGM ground and extending east to Labyrinth Lake.

Table 2 Summary of RC results, 1996

SUMMARY TABLE OF RESULTS

Hole #	Sample Type	Total Number of Samples	Total Table Weight (kg)	Total Pristine Gold Grains	Total Modified Gold Grains	Total Reshaped Gold Grains	Total Gold Grains	Total Pristine & Modified Per kg	Total Gold Grains per kg
OS-96-01	Till & boulder	1	10.1	0	0	3	3	0	0.3
OS-96-02	Till	14	148.7	0	8	56	64	0.1	0.4
OS-96-03	Till	8	79.2	3	21	42	66	0.3	0.8
OS-96-04	Till	1	8.3	0	0	4	4	0.0	0.5
OS-96-05	Till	3	19.1	0	1	4	5	0.1	0.3
OS-96-06	Till	6	75.5	7	8	46	61	0.2	0.8
OS-96-07	Till	9	110.8	0	23	106	129	0.2	1.2
OS-96-08	Till & Sand	11	113	2	19	123	144	0.2	1.3
OS-96-09	Till & Sand	5	42.2	2	5	33	40	0.2	0.9
OS-96-10	Till	1	8.1	0	0	5	5	0.0	0.6
OS-96-11	Till	4	46.8	2	14	46	62	0.3	1.3
OS-96-12	Till & Sand	8	68.2	2	11	52	65	0.2	1.0
OS-96-13	Till	12	126.7	3	11	89	103	0.1	0.8
OS-96-14	Till	11	77.1	4	25	127	156	0.4	2.0
OS-96-15	Till	32	327.2	8	61	403	472	0.2	1.4
OS-96-16	Till	3	32.3	0	0	40	40	0.0	1.2
OS-96-17	Till	15	160.1	3	52	140	195	0.3	1.2
OS-96-18	Till & Sand	5	52.7	1	10	63	74	0.2	1.4
OS-96-18A	Till	3	31.4	0	4	21	25	0.1	0.8
OS-96-19	Till	20	222.9	12	26	164	202	0.2	0.9
OS-96-20	Till	9	97.5	4	13	133	150	0.2	1.5
OS-96-21	Till	5	48.3	6	9	51	66	0.3	1.4
OS-96-22	Till	2	34.3	0	0	12	12	0.0	0.3
OS-96-23	Sand & Gravel	13	137.9	1	4	39	44	0.0	0.3
OS-96-24	Till	1	9.9	9	5	3	17	1.4	1.7
OS-96-25	Till	1	9.6	0	1	3	4	0.1	0.4
OS-96-26	Till	1	10.2	1	4	5	10	0.5	1.0
OS-96-27	Till	6	50.5	3	11	31	45	0.3	0.9
OS-96-28	Till	1	8.5	0	1	1	2	0.1	0.2

In **2001**, 12.7-line km of VLF line surveying was run over the property which at the time was held by Milan Umiljendic with the name 'MUG property'.

1998 AR 32D05SE2006 1125270 Ontario Inc. Ossian Project, Ossian Tp.

11.6 km of VLF and mag. on ground now covered by the nine northernmost patented claims on the west shore of Labyrinth Lake, one of which is on the lake. *Nearly all the work is adjacent to the North TGM block.*

2003 AR 32D04NE2062 Sampson Labyrinth Ossian Tp. SOUTH TGM BLOCK

Stripping, backhoe, clearing of a quartz-green carbonate vein and trenching on two areas on two claims by Labyrinth Lake. The official claim map and his work locations appear at odds, with one area off-property. No other information provided.

2006 AR 20001990 Falconbridge Ltd. Pontiac Tp. Pontiac 26 Project

8.2 km of linecutting, and 5.5 km of mag. and HLEM over an 800 x 800 m grid, PNT-26 on a single claim block, immediately NE of the NE corner of the TGM main block. The grid appears to have been cut in the centre of the claim L3014964 which would overlap onto TGM ground. It targeted an isolated AEM anomaly. The EM results suggested the anomaly was overburden related and no further work was recommended. The location is not entered into GIS.

2007-08 AR 2000638 Golden Chalice Exploration LARGELY OFF PROPERTY

GCX targeted mainly airborne magnetic anomalies – Keating Coefficient products obtained from the regional survey focussing on locating signatures possibly relevant to or indicative of kimberlite targets. Their work is not presented in this report. The report AR 2000638 'DD Report on the Row Lake Project', presents a summary of local work which may have expanded the company's commodity 'hit list' resulting in exploration for Au and base metals.

2008 AR 20005566, AR 20005567 2420-2970 Quebec Inc. Belanger Ossian (Natjo Prospect)

November IP run over N-S lines in the east and NE of the TGM main block, and west of the patented claims by Labyrinth Lake. The project may have included two blocks in Dasserat Canton, Québec. See overleaf.

Four lines and three tie lines + BL were cut for a total of 32.3 km. Phase-Domain IP was run on the four N-S lines using a dipole-dipole configuration with a 50 m dipole and n = 1 to 6. Approximately 23.6-line km of IP data was obtained using a Phoenix IPT-1 transmitter and a Phoenix Turbo V-5 Phase IP receiver. Pseudosections were submitted including plans of such with georeferenced. The survey was performed by Lambert Geophysics of Val d'Or.

Gerard Lambert's conclusions were that several small, individual IP anomalies were defined with weak to moderate IP effects. He did mention two, one at 6350N and 8000N on L8200E could be due to bedrock-hosted disseminated sulphides 30-50 m. below surfaces.

2009 AR 20006219, AR 20006220 2420-2970 Quebec Inc. Belanger Ossian (Natjo Prospect)

In March, two additional IP lines on Labyrinth Lake next to the PQ border. The same equipment and parameters were employed. Two weak IP responses were defined on 2600N and 5400N. Pseudosections are in the '20006220' assessment report. It's possible one or both represent the western extension of the mineralised zone at Russian Kid, PQ. No GPS data is available for plotting into GIS.

2011 AR 20009206 2420-2970 Quebec Inc. Belanger Ossian (Natjo Prospect)

A report by Lambert on a May IP/resistivity survey on grid lines L9600E to L9850E, oriented N-S over 3.8-line km over the west portion of Labyrinth Lake. The report stated:

"The Phase Induced Polarization surveys which were recently completed over six survey lines over Lake Labyrinth in the eastern portion of the Ossian Property for Remy Belanger have defined two weak I.P. anomalies under lines 9700E and 9750E in the western portion of Lake Labyrinth within a low-resistivity environment originating from clay material in the lake. With only a limited knowledge of the detailed geology of property area, it is difficult from a geophysical point of view alone, to rate the I.P. anomalies in terms of their economic potential, particularly if one is looking for gold.

There is a possibility that these two weak I.P. anomalies may be due to disseminated sulphides in the bedrock, at depths in the range 20-40m below surface and they deserve to be detailed with 50m-dipole I.P. surveys and if confirmed, may eventually warrant some efforts (diamond drilling) in explaining their cause.

Recommending other work on this property, I think that it would be worthwhile to run a magnetometer survey along with detail I.P. on the same lines in trying to refine the geological environment in the area around the I.P. anomalies interpreted from the present work."

2009 IP grid lines on Labyrinth Lake. These are largely off property, on patents.

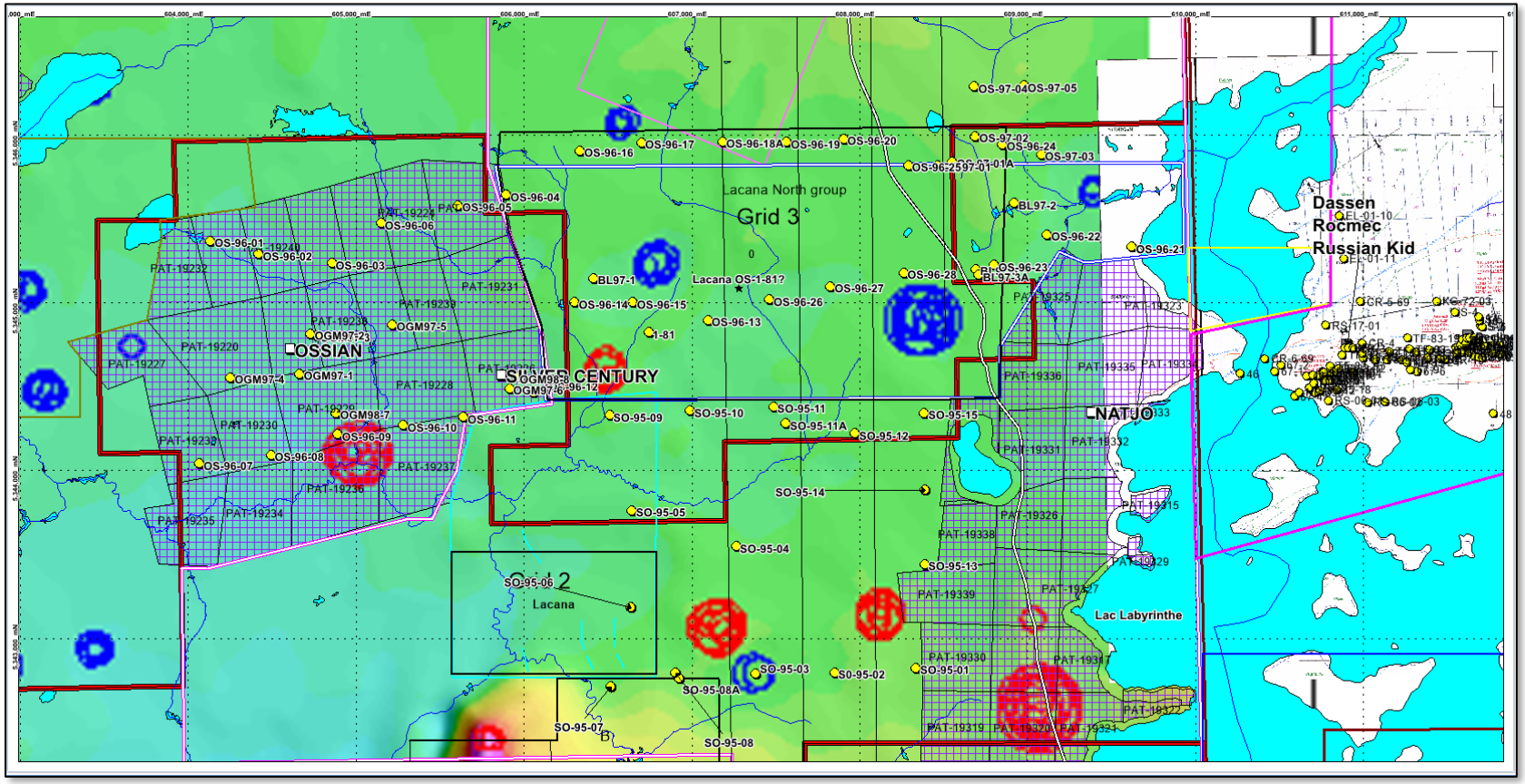


Figure 6 Historic drilling Larder Lake property area, North Block

Historic drilling on and around the TGM Larder Lake property, in Ontario & Québec. TGM North block boundary in red/black.

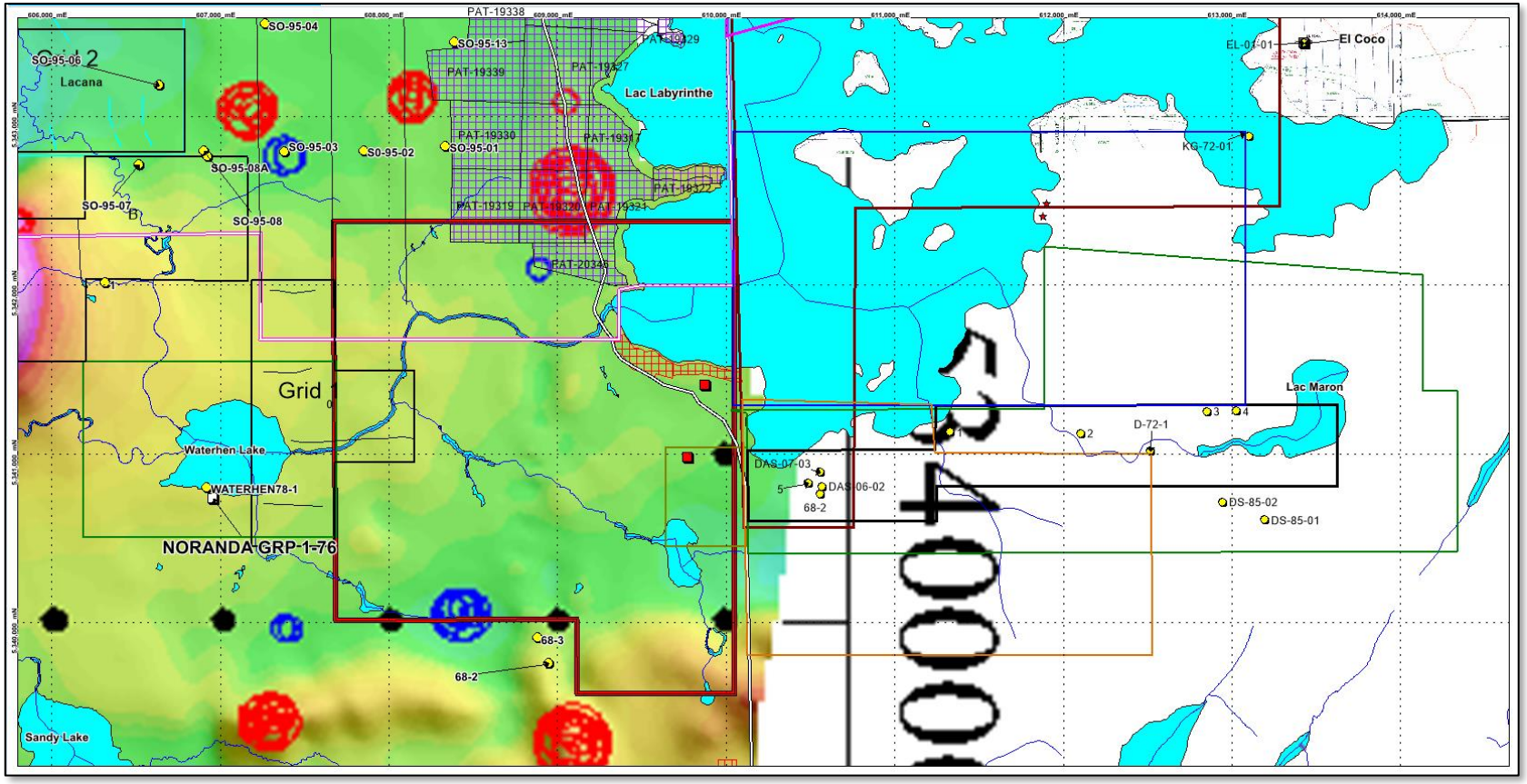


Figure 7 Historic drilling Larder Lake property area, South Block

Trillium South Block historic drilling, Ontario and Quebec. Various property boundaries shown, with TGM in red/black

QUEBEC EXPLORATION

Russian Kid/Bordulac area

Both TGM blocks border Québec. A large number of files are available for examination, of which the vast majority relate to almost 100 years of exploration on and around the Bordulac aka Russian Kid, aka Ressources Nippon Dragon gold mine in Dasserat Tp (canton). Though spatially relevant, the deposit is largely hosted within a diorite-gabbro intrusion that appears to taper off before the Ontario border, with the overall WSW litho-structural trend probably extending between the TGM north and south blocks. Regional government magnetic data outlines the extents of this intrusion. Early regional provincial mapping (Govt. Map 328 A), shows the intrusion extending from the border east to and across Lac Dasserat, a distance of nearly nine km, though subsequent work has shown it to be a discontinuous feature, with the Lac Labyrinthe diorite (not a true gabbro as it was originally described), having a strike length of some two km.

Any recent geological maps for Dasserat and Montbray townships could not be sourced. An early map by Dawson, K. (1950) provides some information on the major units underlying NW Dasserat.

Canton Dasserat Exploration

The **Bordulac gold deposit** was discovered ca. 1925, with PQ government reports dating back to at least 1945. **Report GM05384 PQ Govt. Notes on Mineral Occurrences from Taschereau-Senneterre to Chibougamau** briefly describes exploration, though work in the Lac Labyrinth area is not detailed.

GM 00056-B (drilling); GM00699A (geophysics); Bordulac Gold Mines Ltd.

The following is a condensation of these reports.

Some of the earlier geophysical surveys defined two main conductive zones, one of which parallels the northwest contact of the host magnetic diorite sill (as it was then termed), the other having an E-W trend and lying south of the diorite. Drilling tested the sill and these mineralised ‘shear zones’.

The documents reported on several phases of drilling from 1945, including 13 holes on the deposit, two northern (one at the volcanic-diorite contact, the other to the north), and one south shear, intersecting mineralised quartz-carbonate veins and stringers in variably feldspathised, epidotic, leucoxene-bearing diorite, siliceous diorite, and gabbro. Intruding this are several diabase dykes. Gold values were from nil to $2.10 over 0.3 to 1.75 ft.

Over 80 plus years, there were numerous holes drilled on and near the deposit and the following images covering the Mine and surrounding area display those within the government database.

1935-37 GM 09849 B Bordulac Mines, Russian Kid Property with drilling by Erie Canadian Mines Ltd. (Sylvanite Drilling).

Drilling of at least 14 holes on the main zone, intersecting gabbro, (diorite), granodiorite, feldspathised volcanic rocks, 'quartz streaks', 'highly carbonate material' blebby, speck and disseminated pyrite. No assays provided.

GM 09459PLAN

Drill and trench plan with preliminary geology. Some of the earliest systematic work submitted to the government. Low sporadic gold assays are included.

1946 GM 09460 GM09474

The geology report noted a mineralised shear traced along the central part of the (then) up to 1500 ft wide dyke for one mile. Drill and trench results gave up to $19.50 Au per ton across a width of 5.7 ft. Additional drilling was recommended along strike of the main shear.

Secondly, a 1947 report on the geology of the west-central portion of the claims, specifically claim No. T-2105. Mapped by H.S. Scott, it was previously prospected by L.A. Turcotte under the guidance of Quebecer, Colonel Thain Wendell MacDowell, who was awarded the DSO on the Somme, and the following year, the VC at Vimy Ridge. His bio is available at: https://alumni.utoronto.ca/sites/default/files/inline-files/Thain%20MacDowell.pdf

Four stages of mineralisation are recognized, occurring in the following order:

1. Shear zone replacement by quartz and carbonate with pyrite, rarely a little chalcopyrite, and gold

2. Quartz veins containing fine grained pyrite, and gold, usually intruding along shears

3. Quartz and carbonate veins with very little chalcopyrite and pyrite

4. Barren quartz veins

Stage 1 is dominant in the Main Shear zone, with numerous occurrences of Stage 2.

In the Rich Vein and Zone 8, stage 2 dominates, accompanied by considerable stage l.

Occurrences of stage 3 are few, and of doubtful value. One such vein lies in. the drag-fold at 3180E, and others will be found on the map.

Stage 4 examples are numerous, and with stage 3 are believed to represent late stage. fillings of tension fractures associated with post-ore cross-faults.

1948 GM 01221-A GM 05555 GM 09469

Drilling on extensions of the deposit. Drill logs indicate basaltic to andesitic volcanic sections within the diorite-gabbro, and feldspathic pegmatitic phases in the diorite-granodiorite.

In 1956, Bordulac flew an electromagnetic survey over the property. Results were viewed in a less than a positive light, with weak conductors reflecting an overburden source. A plan map is available, GM05555PLAN, with the survey extending north to the Montbray Tp. line, west to Ontario, and south-east to the south-west shore of Lac Dasserat.

1960 GM 08376 Four holes drilled, 1-4 E (presumably 'Extension'), in ?-1959. GM08376PLAN is available.

1959 drilling intersected quartz-carbonate mineralised shears within granodiorite, silicified granodiorite and diorite and to a lesser extent andesite ran from nil gold to $21.35 over 14 inches. but it is encouraging that these shears, if they continue west would be reasonable targets. Most of the holes intersected multiple quartz-carbonate-py-(chl) stringers, often several inches to less than two feet wide.

1969 GM09469

Bordulac plan map of the geology of the 150 and 300 ft levels, drilling and assay intervals

1947 GM11982 GM11982PLAN

Drilling with an updated geological and compilation map, first produced in 1947.

1963 GM13389

C.W. Archibald's report recommending deeper drilling down to vein target vertical depths of 500 and 700 ft.

1967 GM22581

Drilling of hole 67-5 reported

1967 GM22384

Drilling of seven holes, 67-1 to 67-7. Plan map to that date shown below.

1969 GM26449 GM26449PLAN Gold Hawk Exploration Ltd.

By this time, Gold Hawk essentially owned and operated the property. Surface drilling of nine holes, CR-1 to CR-9, in the centre of the property. A plan map overleaf shows the property extent and drilling. A colour map defining the individual veins, the image is only available in b/w.

EM (IP/OP) was run over a central portion of the claims with the map showing ?planned holes NB-1 to NB-9 testing the conductors. **1970-72 GM27778 & PLAN GM 27912 & PLAN GM28730 & PLAN; GM61106**

Gold Hawk Exploration Ltd. – Dasserat Project

Summarily: Radvak (1970) (**GM61106**) and with a follow-up, in 1972 **(GM61112**) reported on the history of work, recent UG development and surface drilling, potential resources, and estimated costs for a three-phase programme of dewatering, a new manway and drive, drilling, drifting, hoist, mill and shop construction, shaft deepening, metallurgical tests and a new resource calculation. At the time, the gold bearing zones had been explored along a strike of ca. 4,000 ft, remaining open to the east. Average grade was 0.25 oz./ton.

In 1971-72, an option agreement between Kerr Addison Mines Ltd. and Gold Hawk, with the latter retaining 15 of the 56 claims. In the fall, line cutting and geophysical surveying was initiated to test three anomalous areas, with drilling starting in April, 1972.

Crone CEM at 400 ft separation, horizontal shootback method was run over a portion of the grid, whilst another was covered by Crone Jem at 300ft separation, coaxial shootback method. Ground and on-ice magnetic surveys were also completed.

Three anomalies, B, C and E, although weak were selected for drilling. Hole KG 72-1 drilled anomaly E. 142 ft. of OB was drilled through before intersecting a rusty oxidised zone to 212 ft then fine-grained andesite. No samples were taken.

Hole KG 72-2 on anomaly C intersected pinkish-grey rhyolite, a gabbro dykelets, then coarser rhyolite. Gabbro was drilled thereafter to an EOH of 303 ft. Minor sulphides were noted at a contact zone which was sericite-silica-chlorite altered containing 'some gold values'. The gabbro is strongly magnetic.

Hole KG 72-3 on anomaly B intersected magnetic gabbro with four thin shear zones at depth.

Hole KG 72-4 drilled under a trench, hit disseminated Cp which was also noted at surface. Gabbro then a thick sequence of pale green rhyolite with sparse erratic sericite-chlorite schist ran negligible gold.

It was recommended that the claims be returned to Gold Hawk. The report contains a compilation map showing past Gold Hawk/Bordulac drilling, the KG ground geophysics and locations of the KG drilling. Anomaly D was over the northern portion of Lac Labyrinthe, next to Ontario. Drilling was several km east of TGM ground, as far as the just off the eastern shore of Lac Labyrinthe. Locations are in the Sigeom db.

In 1972, mag' and EM surveys were completed over ground from the outlet of Lac Labyrinthe, east, over the riverine connection to Lac Dasserat. Mapping covered the same area which, unsurprisingly is largely covered by low lying ground and swamp. No anomalies of sufficient magnitude 'classed as good prospects for sulphide deposits were outlined…' No further work was recommended.

That same year, Gold Hawk published data on the underground geology and provided level geology and assay plans at the 150 and 300 ft levels.

In the spring of 197,2 work was resumed by Gold Hawk on the property and the existing mining plant as well as several buildings re-habilitated. The underground workings were dewatered, followed by a programme of mapping, surveying and sampling.

Much of this work was preparatory, leading to vending or JV'g the property. That year, they published reserves at the mine **(GM61095)** in all three major categories**.**

Come 1973, Somed Mines reported on work on the decline into Russian Kid, (the original discovery vein), with temporary stoppage after an advance of 460 ft (**GH61096 & PLAN**). The tunnel followed a 2-4 ft wide gold-bearing quartz vein. Updated sample results and an informal resource estimation were also provided, plus cost estimates for milling at Kerr Mine, upgrading the mine access, mine development overall, including deepening of the shaft, new hoist facilities and production expenditures.

1973 GM 28812 & PLAN

Following ground Crone Radem EM and mag, a single hole was drilled to test an anomaly located south of Lac Labyrinthe. The 360 Az drilled hole has an incorrect location in the PQ db. This work appears to have been more to meet assessment requirements than any firm test. Dacite, thin locally pyritic graphite, rhyodacitic mudstone, andesite and rhyolite were intersected. No assays were reported.

1973 GM29797 & PLAN Mines Somed Bordulac Option

Somed optioned the Gold Hawk property, then 102 claims covering 5,427 acres (ca. 22 km^2). The company reported previous drifting on two main targets, the Talus and McDowall veins, and drilling of several holes, the S-* series. Much of the document is devoted to UG development (shaft and/or decline, connecting to the 300 level and a stage two of decline development extending down to the 450 level); raises, lateral work and additional level development, (450 ft), with all work costed out.

Somed mines collared a decline on the Russian Kid vein structure with the final objective reaching the 300-foot level and the MacDowell vein. The decline was designed to give easier access to the old workings and make available for immediate mining the tonnage developed.

The decline was advanced 460 feet following the vein structure and sampling showed that gold values were erratically distributed. A programme of surface drilling was carried out ahead of the decline to provide information for the continuation of the tunnel. Six holes were drilled at shallow horizons and two holes intersected what was believed to be the MacDowell vein.

Somed mines was unable to arrange finances and the decline was discontinued. The only work carried out for the next few years was sampling of the ore dump and some surface prospecting. The property reverted back Gold Hawk.

1976 GM59500 Thunderwood Explorations Ltd. Dasserat Tp. Property

A report on this and their Larder Lake property. It held a 90% interest in the two, with Dasserat essentially holding the Gold Hawk property. No further work had been carried out due to depressed gold prices, and recommendations were made to retain both on a caretaker basis.

1978 GM37114 & PLAN El Coco Bordulac Option

El Coco optioned the property from Somed, and submitted a report, summarising past work and providing resources estimates, and recommending as Stage I, a study on a fast, economic return to UG ore development coupled with custom milling of ore dump material. Stage II was a 300 ft level decline, building construction, raising and stope development, and more drifting on the MacDowell vein. Stage III would be mining and milling of developed ore, and UG development. The PLAN report includes very schematic geology with major veins, a location map and a long section.

From the 1986 report GM44016 (see below), the company upgraded the access road into an all-weather gravel road to the portal site of the ramp. Buildings were erected including an office, dry and machine shop. Power generating and compressed air facilities were installed.

The ramp was widened and extended by 2,672 feet to reached the 425 feet level. The McDowell was explored for 1,490 feet at the 150L, 1,662 feet at the 300L and 666 feet at the 425L.

Test shrinkage stoping of the McDowell vein was conducted. A total of 24,966 tons of ore was removed. The initial 2,214 tons with a mill head of 0.143 ounce per ton was tested in a cyanidation circuit at the Lamaque mill.

Recovery was 93.8%. The succeeding 7,152 tons with a mill head of 0.063 ounce per ton was tested in a flotation and cyanidation mill of Belmoral Mines. Mill recovery was 81.3%. The remainder of the exploited ore were stockpiled on surface (4,313 tons) and underground (10,903 tons). These stockpiles were reported to average 0.087 ounce per ton. Don Lavigne of Belmoral Mines reported that these stockpiles were sold and removed by the Royal Bank of Canada (Oral communication)."

1982 GM39228 El Coco Corp. Falconbridge Copper Project 049-70

El Coco Corp. held a portion of the Gold Hawk/Bordulac claims by staking six claims covering part of the differentiated diorite stock that hosts the El Coco mine. The report is a somewhat cursory property evaluation, essentially a preliminary appraisal. The claims, 404115-118, (7 ha), covered a thin strip adjacent to the north boundary of now leased land over the El Coco mine:

1983 GM41154 & PLAN Metalor Russian Kid Property

"In the latter part of 1983, ABBDL-TECSULT INC., was commissioned by METALORE Resources to conduct a project review and feasibility study of the property. The report included a geological surface map and series of sections. Examination of these materials show that the underlying rock

type where mineralisation is predominant are generally intermediate to acid intrusives more specifically DIORITE to GRANODIORITE in composition. There was a limited occurrence of volcanics (andesite) and showings were confined in the western and southern part of the mineralised zone." F. Scott report for Dassan, 1986 - GM44016.

Drilling (TF-83-* series in the PQ db) of 30 holes along the overall strike of the Russian Kid deposit, down to 400-500 ft depths.

1984 GM44016 Dassen Gold Russian Kid Property report

El Coco changed its name to Dassen Gold and provided an update on work.

Of great import was the technical evaluation by A. Po., Mining Geologist in an accompanying document. For its time, the review was quite vigorous, with examinations of mine plans and sections, correlations made between assay and sampling maps with geology and sections, checks on grade control and overall quality of data. His conclusions were:

- Mineralisation is strongly structurally controlled by near E-W faults, traceable for over 12,000 ft.
- Wall rock alteration halos 'specially sericite" are consistent with hydrothermal activity.
- There is a wide range in ore estimates from a low of 422,625 t @ 0.19 opt for Indicated Ore to a high of 1,126,000 t @ 0.22 opt for Inferred Ore.
- Tecsult used arithmetical means instead of a weighted average in calculations
- Gold distribution is erratic, with 'pinch and swell'/lenses and pods, thus defining a mining reserve "is difficult if not impossible."

Recommendations were continuation of surface drilling over UG work for monetary reasons (this would require de-watering and rehab of much of the mine), and step-out drilling, in particular, the Russian Kid vein which may represent the eastern extension of the MacDowell vein.

In 1985, the company commissioned a drilling programme to trace the mineralised structure both east and west along the strike direction of the then known mineralised zone. The drilling was conducted in November and December of 1985. Eighteen holes with a total footage of 13,434 were completed. This programme was successful in tracing the mineralised zones for another 400 feet to the west and 1600 feet to the east from its original known limits.

"Dassen is currently re-evaluating the potential of the property prior to committing further work."

1983 GM44107 & PLAN Dassen Gold Resources Les Mines Morono Ltée, Metalor "F' Project

Drilling of 18 holes (85-* series) for 13,434 ft. supervised and managed by Services Exploration, Rouyn-Noranda. The programme investigated possible extensions to Au-bearing horizons

outlined by previous drilling. Holes 85-10 to 85-14, and 85-18 were drilled near the old shaft and holes 85-01 to 85-09, 85-15, 85-16, and 85-17 were drilled east of the ramp entrance.

"The mineralisation occurs mainly in diorites that have been cut by east-west trending faults dipping 55° to 75° S. Faulting may have given access to hydrothermal solutions resulting in altered diorites - silicified diorites, quartz diorites and tonalites. Most of these silicified zones have 2 to 10% disseminated pyrite and some quartz veins have massive pyrite (5-30%) bands along their margins. The best gold assays occur in massive pyrite bands. There are five mineralised zones that have strike length to them. Three of the zones; that is, Zone 3 (McDowell Vein), Zone A (Talus Vein) and Vein B extend from 20000E to 23500E (3500 feet). The gold assays vary between 0.01 and 0.61 oz/ton over widths of 1 and 5 feet. There are some good: gold intersections; such as:

Section 19400E - DDH: NB-25: 0.196 oz/ton over 10 feet

Section 20000E - DDH: 85-14: 0.123 oz/ton over 12.5 feet

Section 21500E - DDH: 83-24: 0.141 oz/ton over 10.2 feet

Section 23500E - DDH: 85-05: 0.102 oz/ton over 15.8 feet

Underground workings on the property are close to most of the mineralised zones; that is, zone 3, A and B. Hence the property has merit because of the extension of the mineralisation and the vicinity of the underground workings to the mineralisation."

1983 GM4115 & PLAN Metalor Russian Kid

Logs of the 1983 drilling, with a more detailed plan of the DDH's and geology, this by ABDL-Tecsult who provided a resource estimate for the deposit.

1986 GM57625 & PLAN Ressources Auriferes Dassen Ltée/Mines Morono, El Coco property

Somewhat confusingly, the same report on the Nov-Dec 1985 major drilling over the El Coco/Russian Kid deposit and it's strike extensions, with drill logs, clearer maps and drill sections, and a padded conclusion/recommendation section, to wit:

A compilation of historical geology, surface and underground drilling, re-interpretation of the mineralised zones, new sections and 3-D modelling; IP surveying, drilling east of the deposit (17500 ft); UG sampling and an updated ore reserve estimation.

2000 GM58742 & PLAN; GM58743 & PLAN; GM58744 & PLAN Dasserat Resources/Ressources Dasserat Geophysics and Drilling

IP and ground magnetometer surveys and an April 2001 report on drilling at El Coco, with 17 holes (El-* series), drilled for a total of 2,905 m., this in a more modern (format and content) submittal, including assays, drill logs, sections and a drill plan map. Poor results were obtained from targets drilled south of the shear zone hosting the gold mineralisation, with only one, EL-01-01 recommended for follow-up. It ran 1.25% Cu and 4.2 g/t Ag over 0.3 m.

North of the Lac Labyrinthe fault, results from holes 10 and 11 were unimpressive, with 10 failing to reach bedrock and 11 intersecting weakly altered faulting. Both target areas tested IP responses.

In the area between the Lac Labyrinth fault and the Russian Kid Mine, holes 8 and 9 crossed zones of intense carbonate-sericite-silica with quartz veining and weak to moderate sulphides. This was interpreted to be another E-W 'shear', located some 800 m north of the mine.

Holed 6,12,15,16 and 17 tested extensions of the Russian Kid fault with several encouraging gold intercepts. Recommendations were made for additional drilling with this locale, the priority.

The drilling is covered in **report GM58743.**

A summary pdf from the report is provided, below.

The company trenched several areas east of the east shore of Lac Labyrinthe, but these are deemed too distant to be directly relevant. Descriptions and locations are in **report GM58742.** Reconnaissance mapping and verification of data in Leduc's MB-96-14 is covered. Some 43.5-line km of mag. and 34-line km of IP was completed with recommendations made for the stripping of several areas that yielded favourable IP responses. On examination, most are related to magnetite, and the highest-grade sample ran 90 ppb Au.

2006 GM62961 Rocmec Russian Kid property

Drilling of three holes RS-06-01 to -03, for 1872.6 m, testing the McDowell, Talus, Vein and Boucher veins/zones, extending known mineralisation at depth. Holes 2 and 3 are close to Lac Labyrinthe, with the zones hosted by andesite and BIF, not diorite/'gabbro'. A technical report was planned for the deposit. From 2006 to 2010, a total of 12,300 m of core was drilled by Rocmec from surface and UG.

2010 Rocmec Russian Kid property SGS completed a technical report with a resource update for the Rocmec 1 Mineral Deposit (Russian Kid). From March to April 2010, Rocmec drilled 14 additional holes totalling over 2000 m on the western part of the property, testing the McDowell, Talus, Boucher and Boucher 2 structures. Prior to this, Rocmec acquired the surrounding 99 claims held by Ressources Dasserat Inc. The claims were held by the government for non-

payment for unspecified reasons, and later released. By 2011, most of the infrastructure had been re-built, including re-opening of the portal.

Below, resource calculations

Classified Global Resources at 3 g/t Au Cut-off

Vein/Structure	Classification	Tonnage	Au (g/t)	Oz (31.103 g)	Average Thickness (m)	Volume (m3)	Surface (m2)
Total	Measured	124 800	6.95	27 900	0.77	46 200	60 300
	Indicated	445 400	6.40	91 600	0.65	165 000	255 000
	Total	**570 300**	**6.52**	**119 500**	**0.67**	**211 200**	**315 300**
	Inferred	1 512 400	7.40	359 600	0.75	560 100	749 900

Classified Global Resources at 6 g/t Au Cut-off

Vein/Structure	Classification	Tonnage	Au (g/t)	Oz (31.103 g)	Average Thickness (m)	Volume (m3)	Surface (m2)
Total	Measured	63 800	9.21	18 900	0.79	23 600	29 700
	Indicated	171 200	9.64	53 100	0.62	63 400	101 500
	Total	**235 000**	**9.53**	**72 000**	**0.66**	**87 000**	**131 200**
	Inferred	762 300	10.31	252 600	0.71	282 300	399 500

Figure 8 Rocmec resource summary, Russian Kid Property

Below, from the SGS report, a view of the veins and structures. Resolution is poor, but legible in the original document. There is a suggestion that structures continue west into Ontario, though the extent of mineralisation is less clear, and historically, there has been very little gold intersected between under the lake and the Ontario-Quebec peninsula.

2013 GM67408 & GM67867 Rocmec

Field investigations, mag. and VLF over the Boucher and Rocmec 1 property.

2014 GM68499 & PLAN Rocmec

Sampling some 500+ m to the north of Russian Kid Mine along a NE trending 'shear zone'. The assessment report is more of a technical report, and covers lithogeochemical sampling over six claims north of the historical work, with recommendations for more IP and detail airborne geophysics. By this time, Rocmec had changed its name to Nippon Dragon Resources inc. No significant gold values were returned, but the area was deemed prospective for VMS, this based on IALT values in two distinct volcanic units.

The area of interest is shown below. Original document resolution is marginally better.

The western extension of the gabbro would trend into Ontario between the TGM North and South claim blocks

Subsequently, Nippon Dragon carried out very minor surface exploration, the drilling of a single hole for 129, and in 2017, engaged DIAGNOS Inc. to evaluate the project using its 'proprietary software', 'CARDS'. See **GM71482**

2015 GM69433 Ressources Nippon Dragon

A GPS ground magnetic survey, with data processed into several formats and GIS programmes. The survey defined two lithological/lithostructural domains.

1946 GM00278, GM00343, GM00343PLAN, GM06007, GM06222, GM06222PLAN Freeport Exploration Co., Nemrod Prospecting Syndicate

Claims at the southern end of Lac Labyrinthe, extending from the Ontario border east for some 4.2 km into terrain underlain by Cobalt Series sediments. A single mining claim west adjacent, in Ontario is flanked by the TGM South block.

In 1946-47, limited surface work including several trenches, grid magnetic and EM surveys and geological mapping. The geophysics and geology indicate generally E-W trending stratigraphy dipping steeply south. Underlying geology is a mix of dacitic volcanic rocks, cherty flows and tuffs with fragmental rocks, andesite, minor diorite and feldspar porphyry, and in the east, Cobalt Group conglomerate.

Po-py in minor concentrations was noted in rhyolitic fragmental rocks, N-S striking fractures and disseminations in acid volcanic rocks. Quartz veining and shearing were rarely noted. Few assays were reported and were nil to 0.108 opt Au in the vicinity of the Tp. centre line. It is presumed the overall geology extends west onto TGM ground. Some 14 anomalies were detected from the surveys, and five X-ray holes (381 ft) were drilled to test anomalies. No further work was recommended.

In 1972, Noranda explored the eastern portion of the Nemrod property, conducting mag. and VLF surveys, and drilling one DDH for ca. 500 ft., testing an E-W trending VLF conductor. Py-graphite mineralisation underlain by 9 ft. of rhyolite breccia carrying 25% py-po was intersected. No assays are available.

1968 GM24073 Nickel Rim Mines

Drilling of a single hole, 68-2 for 405 ft. on ground previously held by Nemrod. It intersected fine to coarse grained diorite with sparse fine weak py-po and locally chlorite-quartz stringers. A single assay returned nil nickel.

1982-84 GM41473 & PLAN Aur Resources Labyrinthe property

Linecutting and mag. surveying, with most anomalies due to diorite sills. The report states no anomalies correlated directly with py mineralisation. In 1983, geological mapping, grab sampling, with felsic volcanic rocks identified but assays appear undocumented.

1984 Completion of a soil survey targeting base metals on a property covering much of the original Nemrod ground. Results were inconclusive, with samples only assayed for Cu & Zn if run at all. The company recommended VLF and some geological investigations. The report noted massive to pillowed mafic flows in the south, with most of the property underlain by

intermediate volcanic rocks represented by massive to pillowed porphyries and flow-top breccias. Near the northern boundary are felsic volcanic rocks, including fragmental rocks. Magnetic, massive diorite intrudes in several locales particularly in the NE and along the west shore of Lac Maron. In the SE there are exposures of Cobalt Gp. Sediments.

Four sulphide showings were examined, the most "impressive" being the sulphide horizon in chloritized mafic volcanic rocks near the northern boundary. Samples ran 55 ppb Au and 125 ppm Zn. Highest Au was 5-10 ppb Au and 45 ppm Zn. Overall, mineralisation is pyritic, often associated with quartz-chl-carbonate, with sericitic alteration in felsic-intermediate volcanic rocks. A geophysical-diamond drilling programme was recommended.

1987-88 GM45775 & PLAN GM47819 & PLAN GM46721 Aur Resources Labyrinthe Project

Mapping though the 'updated' geology map from the 1983 publication only embellishes previous work, and removes some information. The following year, the company ran HLEM and mag. and recommended further work on several conductors, with two possible candidates for drilling, and elsewhere, IP to further define known sulphide mineralisation. EM conductors and profiles are in the report, but have no GPS reference, but several are along the known sulphide mineralised trend (see geology map), and others merely one-line, probable surficial responses. In 1988, a compilation map was produced in a separate assessment report, which is provided below. The western boundary of the Aur property is at the PQ-ON border. It is presumed the overall geology extends west onto the TGM South block claims, some 400 m west. Image modified for clarity. The 1988 summary is provided as it is of direct bearing on the prospectivity of the neighbouring TGM South block. As follows:

The Labyrinthe Property is located approximately 40 kilometres west of the Rouyn-Noranda, along the Quebec-Ontario border. The claims are situated within the Blake River Group of volcanic rocks near its southern boundary defined by the Cadillac-Larder Lake fault zone.

"The property is underlain by a south facing homoclinal submarine volcanic sequence that has been subdivided into three major lithostratigraphic units. The northern lower unit consists of interlayered mafic and felsic flows. An eastward increase in the abundance of felsic pyroclastic material suggests that the source of the eruptive material lies beneath or to the east of Lac Maron. A number of NE-SW trending sinistral faults with limited stratigraphic extent indicate concurrent block fault tectonism with the volcanic eruptions. The unit is capped by a graphite and sulfide-bearing exhalite horizon that is overlain by a succession of mafic to intermediate submarine volcanic flows of the middle unit. Several flows have been mapped and each flow is typically composed of massive lava at the base that grades upwards into a pillow lava and the flows are capped by hyaloclastic breccia. Except for one plagioclase porphyritic unit the flows are characteristically aphyric. The upper unit is magnetic but otherwise shows the same morphological features as the middle unit.

The volcanic rocks are unconformably overlain by conglomerates and wackstones of the Cobalt Group in the south-eastern part of the property.

The rocks have been deformed into an EW trending steeply dipping homocline. A weakly developed schistosity is mainly observable in the pyroclastic and hyaloclastic horizons. Pillows, fragments and amygdules are not generally deformed which precludes widespread shearing. However, some shearing has been recorded at flow contacts and within a biotite-chlorite alteration unit. A late NE-SW fault, parallel to the Cobalt Group contact, has offset the volcanics in the east part of the claim group.

Sulfide mineralisation is widespread on the property and two classes of showings have been defined: volcanogenic mineralisation associated with the mafic-felsic unit in the north and structurally controlled sulphide mineralisation in all lithologies. The northern unit has been the center of a sub-volcanic hydrothermal system that has altered and mineralised the volcanic rocks. Disseminated to semi-massive sulfide mineralisation is associated with zones of sericite and chlorite mineralisation in the felsic pyroclastic horizons. The graphite and sulfide-bearing exhalite horizon that caps the lower unit is thought to represent the waning stage of a volcanic cycle.

Sulfide mineralisation is also associated with zones of shearing or occur in the biotite-chlorite alteration zone, the presence of a shear zone within its boundaries in the center of the property and a geophysical anomaly along its western extension are considered highly prospective. Another significant anomaly occurs in the southcentral part of the grid in the vicinity of a chalcopyrite-bearing quartz vein. Both these anomalies are thought to be caused by bedrock conductors.

Weakly anomalous gold values up to 90 ppb were detected in sulfide-rich fractures in rhyolite in the northcentral part of the property.

These results underline the favourable exploration potential of the property and justify additional work to investigate the targets that have been outlined. A two phased exploration is recommended that will include mechanical stripping, geological mapping, a lithogeochemical alteration study and a minimum of 2,000 feet of diamond drilling. A total of $79,700.00 has been budgeted to carry this work."

2006 GM62958 Falconbridge Lac Labyrinthe property

Drilling of a single hole, DAS-0602 for 268.1 m, drilled near easterly, testing a MegaTem geophysical anomaly. Gabbro was intersected and mineralisation in the form of 1-2% cluster py-po in fractures from near surface down to 230 m; thereafter an unmineralised diorite dyke. No significant grades were intersected and the down-hole pulse EM survey picked up an off-hole anomaly at 200 m depth.

2007 GM63541 Xstrata Lac Labyrinthe property

Drilling of a single hole, DAS-07-03 for 344 m, testing a MegaTem geophysical anomaly (DAS-06). The hole was drilled SE, designed to drill under DAS-06-02. The BHEM pulse survey indicated an

in-hole conductor at around 310 m, and likely related to magnetite in basalt, or pyrite in a graphitic argillite at 313.7 m. No significant Au or base metals values were returned.

2014 GM68485 Ressources Falco Ltée Lac Labyrinthe 2005 property

Reporting on a sampling programme over the Aur ground and into south-adjacent claims once held by Golden Harker Expln. (See below). From 1946 to 2008, there have been three mag. surveys, four EM, six geological surveys and four drill holes on the property.

A total of 73 samples were taken during prospecting as part of an evaluation of the potential to host exhalative mineralisation associated with second order structures. This included exploring for surface expressions of graphite-sulphide mineralisation intersected in historic drilling and investigation of an EM anomaly directly to the north of a Cp mineralised showing.

Falco described the geology as:

Translation: East-west striking, steeply south-dipping, with the stratigraphy consisting of "a lower unit composed of mafic rocks intercalated with volcanic rocks felsic and capped by a horizon of graphitic tuff; a central intermediate to mafic volcanic unit; and, at the top, a magnetic variolitic mafic volcanic unit. Off the property, to the southeast, are unconformable, shallow to flat-lying Cobalt Gp.

The geology map below either demonstrates exceedingly low outcrop exposures or an unwillingness to provide geological data. Results were negative, with nothing of significant economic value and the property downgraded. The report did note several EM conductor axes remain unexplained.

1985 GM42705 Golden Harker Explorations Ltd.

Drilling of two holes, DS 85-1 and -2 for 305.23 m. on claims south adjacent to Nomed and later Aur properties, just south of Lac Maron. An odd assemblage for the Blake River Gp., sandstone, carbonate sandstone, mudstone, quartz-carbonate-fuchsite altered, locally silicified and/or brecciated rock, and at depth, volcanic conglomerate was intersected. Au and Hg assays were negligible, with the highest for Au of 127 ppb, but the alteration is quite interesting.

No information could be sourced on the old, pre-1949 drilling shown on the map.

1994 GM53299 & PLAN Service Exploration Enrg. Lac Labyrinthe Project, Lac Maron grid

Airborne magnetometer and Geonics VLF EM surveys over ground north of Aur/Nomed, and covering a portion of Lac Labyrinthe but the target was diamonds. Several E-W formational EM trends were discovered.

1994 GM53691 & PLAN Silver Star Resources Labyrinth Lake Project

A compilation report of previous work over their claims which bordered the El Coco/Russian Kid deposit (now a lease), extending to the Ontario border. The summary was just that, with no

major insights into the controls on mineralisation. It recommended IP surveys. The property was purchased in 1993 with MaxMin run the following year. Subsequent work was published and the property sold. The general compilation map is shown overleaf.

1958 GM17048, GM17048PLAN, GM36271, Breen Mineral Exploration

Breen, a private company, held 630 acres north-adjacent to Bordulac's ground, extending to the Ontario border. It touted more exposed gabbro and shear zone numbers than on Bordulac, agglomerate and rhyolite, and a greater length of favourable contact zone as reasons for attracting investors.

In **1965** A mag. survey was run on land and ice covering all the claims. It would appear the survey did not provide sufficient clarity or interest to warrant further work.

PQ Canton Montbray Exploration

1973 GM29676 & PLAN Giant Yellowknife Mines

Drilling of three holes on property in the south-west corner of Montbray-Dasserat, at the Ontario border. Ground magnetic and VLF surveys were run and data from these was used to produce targets. Two km from the Ontario border, the geology map provides little information on Ontario prospectivity. No mineralisation was intersected and no further work recommended. Targets were on or near rhyolitic exposures.

1997 GM56076 Agnico-Eagle Montbray 'A' property

Sixteen holes totalling 3,198.4 m were drilled on Montbray 'A', targeted the continuity of the Montbray Zone, the Twin zone and the corridor between the two. The drilling confirmed the presence of a structurally controlled gold system crossing the property in an ENE direction for a strike length of at least 2.1 km. This exploration phase has also effectively closed off the Montbray zone to the west and outlined a low-grade pod extending to a minimum vertical depth of roughly 190m in the Twin showing sector. A second favourable zone is also present in hole 28-97-27. Drilling also served to outline a granitic intrusive with anomalous gold — copper — molybdenum background values on the southwestern extremity of the property.

The drilling was a continuation of work from 1995, with prospecting (auth. Leith in part), mapping, geophysics and early drilling.

1998 GM56383 & PLAN Agnico-Eagle Montbray Project

Officially a prospecting programme, the NW-SE trending geology was mapped using a NW-SE contiguous grid and divided into a very broad classification of a mafic and intermediate volcanic suite with a single mafic volcanic intrusion cropping out in Montbray 'D'. The Pontiac Tp. geology on their map would trend SSW onto the TGM North block ground, but the geological information is very basic.

The purpose of the programme was to locate additional Au showings that were located on two properties to the NE, notably the farthest NE, Montbray 'A'.

Within this geological sequence, there appears to be an ENE trending zone associated with epidote-silica-haematite over a distance of five km. "Several gold anomalies detected in heavy mineral concentrates from till samples are listed according to the axis of this structure. The most important gold anomaly is 68.11 g/t Au. It is located near the northern border of this property. The purpose of the campaign is the investigation of E.N.E. parallel to the gold fault. Significant lineaments suggest that the two structures cross the southern portion of the property."

These postulated trends are largely based on air imagery/geophysical interpretation, and would cross into Ontario and onto the TGM North block, NE corner. The report doesn't indicate any more work in Pontiac or western Montbray, with only one area in the far east stripped, mapped and sampled. A-E concluded that based on the prospecting, the favourable structures and associated alteration and mineralisation on Montbray 'A' and 'B', did not extend westwards and no further work was recommended. Possibly of import was that no felsic-(intermediate) volcanic rocks were found.

However, considerable work ensued, including stripping, trenching, and drilling on at least four showings.

Also, the gold shears to the NE generally trend N-S so the ENE trend may be a red herring. The underlying geology for much of the area is NE-SW striking, including in Pontiac Tp., Ontario. Secondly, the dominant ice direction is SSE to almost South, similar to that in Ontario. The grid soil/till sampling was over NE-SW?-structural trends to cover the aforementioned air-interpreted lineaments with partially co-incident alteration. Thus any results would not produce an anomalous dispersal 'train', rather spot highs in the youngest surficial sediments.

Ideally, several longer sample transects parallel to the ice direction should have been carried out, then correlated with Quaternary and outcrop data. Pit excavation would be a reasonable option.

1997 GM56427 & PLAN Agnico-Eagle Montbray 'B' Project

Drilling on the western extension of the Montbray zone, with plan below. Targets were on and around the Westex showing, and south-east around the Clarice showing. Sections are in the report. Drilling is 2.5 to over five km from Ontario, but as mentioned above, the zone would trend onto TGM North block ground. Au results are in the 1-3 ppm range over sub-m. to 2.5 metre widths.

Sulphides are typically pyrite in inter-pillow zones in mafic volcanic rocks and in 'pockets' of silicification.

"Drilling has verified the lateral and vertical continuity of showings discovered during the 1997 mapping campaign. All zones tested are limited in terms of gold mineralisation. Holes 01 to 04 did not return significant gold enrichment but do confirm the extensive alterations noted along

the base line. These rocks are marked by spotty weak gold enrichment with epidote, chlorite, carbonate, sericite alteration. Weak silicification is also present. The remaining holes (05 to 07) have shown that the Claris, Claris Sud, and the Early showings are of little interest since they are of limited extent.

This diamond drilling and previous mapping campaign have outlined the spatial relationship between gold showings and the granodioritic plug present in the east central portion of the property. Only a small fraction of this intrusive outcrops on this and adjacent properties. The eastern contact of the intrusive is marked by wide zones of silicified breccias (i.e., the Twin Showing sector) along the 070 Break but remains untested at its north-western contact. This area should be the focus of further drill testing."

1998 GM58337 & PLAN GM58338 & PLAN Agnico-Eagle Geochemical Surveying

In May, Poirier-Leith was optioned and the company commenced a large programme over western Montbray Tp., and into Pontiac covering the NE portion of TGM North block. Pontiac work was not found in the Ontario AFRI files, but in the report, it forms a block named Pontiac 'A', PN-50, contiguous with Montbray 'C', PN-30 and Montbray 'D', PN-36. The project was spawned by regional airborne geophysical data (in-house interpretation), the prospecting success on Poirier, with expanded till sampling, and follow-up prospecting, this over much of Montbray Tp, with blocks designated Montbray 'A' through to 'D', plus Pontiac 'A' in Ontario.

As part of Phase 3 exploration, additional grid till sampling ('Phase 4') was completed over the previous years' till sampling, with a total of 208 gold grains recovered. Several were of 'appreciable size and delicate', this from the processing of 31 x 15 kg samples. The report also provides location maps for an earlier large scale Quaternary sampling programme across the Project. The phase 3 programme located several more anomalies separate from the previous sampling. Reconnaissance till sampling was by hand shovel.

Phase 5 sampling was also on grids and involved mechanical augering to 2 metres depth. This sampling is recorded in the PQ DH database.

New Au anomalies were discovered including a second NE of the original discovery in the corner of Montbray 'A' in the NE of the project area, close to their property boundary. A third was located in the far east of Montbray 'C', near the north shore of Lac Dasserat.

Sampling the till north of the Montbray zone in NE Montbray 'A' established that there was a parallel, spatial relationship between a proposed mineralised or at least altered zone and a NE trending lineament. This formed the basis for further exploration phases.

The gold counts are very low in Pontiac, but steadily increasing eastwards.

1998 GM56452 & PLAN Agnico-Eagle Montbray 'B' and Pontiac

Drilling in the far south-west of Montbray 'B', testing strike extensions to Westex and near anomalous gold from till sampling. Also, mapping covering western Montbray 'B' and the

Pontiac block, in Ontario. Weak gold enrichment was intersected, silicification less intense than to the east, but stockwork-type quartz veining not observed.

“Holes put down during this campaign did not intersect any significant gold enriched horizons. It appears that the brecciated silicified horizon narrows and the alteration diminishes in intensity towards the west. Coupled with the mapping on the adjacent western property which did not turn up any alterations or deformations characteristic of the Montbray — Twin horizon, there is little evidence that the gold anomalous horizon outlined to the east continues onto the Montbray C property adjacent to the west.

No satisfactory explanation for the till anomaly can be found in the stratigraphie gate (sic) covered by the diamond drilling. Given the important overburden thickness encountered during drilling (10 to 40m) the proximity of the source of the till anomaly is doubtful.

No further work is recommended for the western extension of the property where drilling (this campaign) and mapping have failed to prove the existence of an extension to the Montbray-Twin corridor in this sector. Drilling is recommended for the eastern portion of the property centred over the granodioritic plug.”

2004 GM62618 Agnico-Eagle Montbray Block

Airborne magnetic and TDEM (time domain EM) survey flown by Geotech over the entire block, the western boundary of which is immediately east of the Ontario border.

Two main EM anomalies were detected, both in the south-west of the grid; one representing the western extension of the Montbray zone, and west of any Agnico drilling, the other approximately one km to the north co-incident with the Blue Lake fault. Both trend south-west towards the far north and north-east corner of the TGM North block. A western extension of the Blue Lake fault into Ontario is unknown, but if present, would trend onto TGM ground.

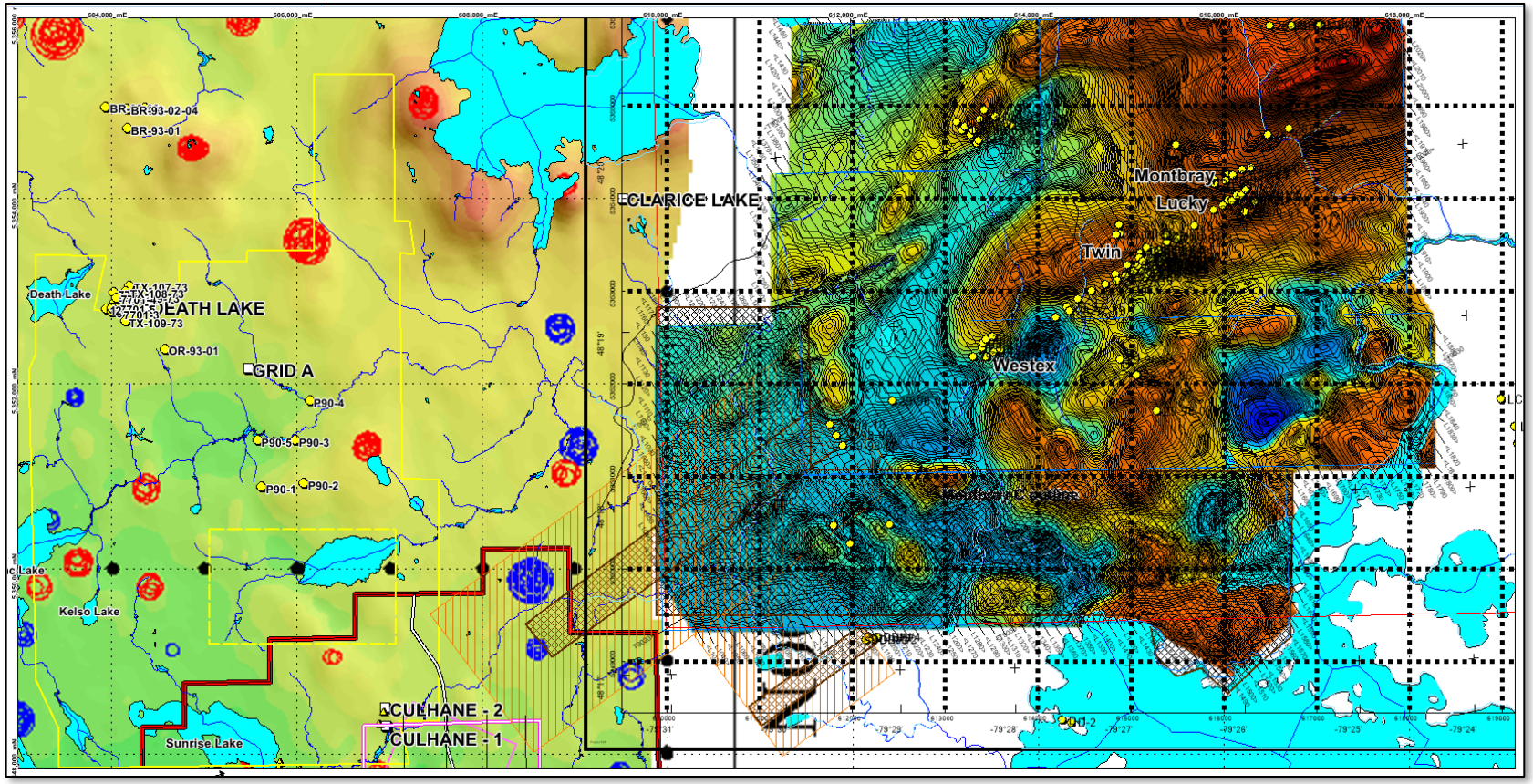


Figure 9 Agnico-Eagle Montbray compilation II

The Agnico-Eagle Montbray Project compilation, showing airborne magnetic data, drill distribution, mineral zones and extents of alteration zones and anomalous till samples (Au), the latter as two cross-hatched trends continuing into Ontario ('Project Pontiac). The north-east corner of the TGM North block is shown in red.

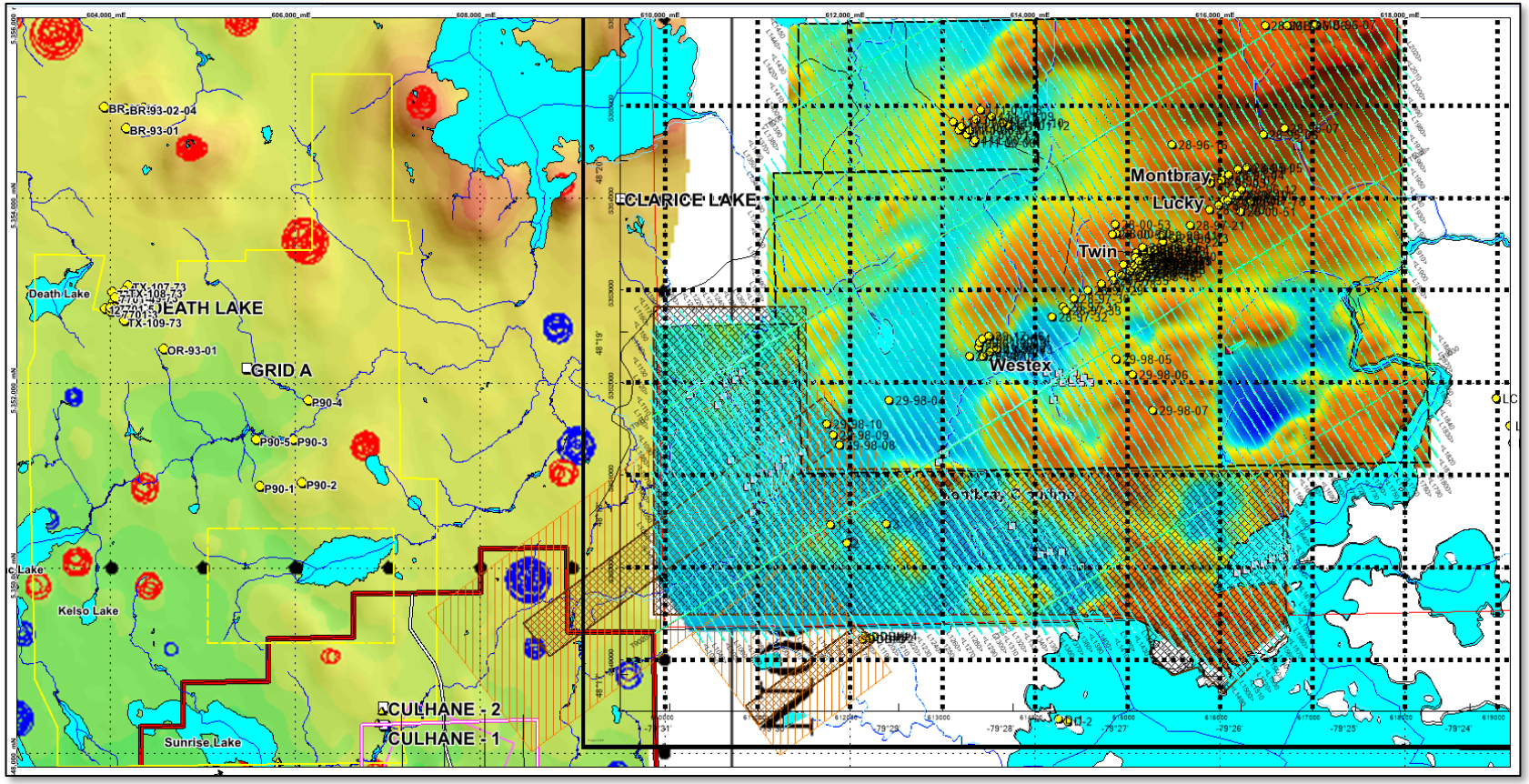


Figure 10 Agnico-Eagle Montbray compilation III

Agnico-Eagle Montbray Project compilation, showing VTEM line data, drill distribution, mineral zones and extents of alteration zones and anomalous till samples (Au), the latter as two cross-hatched trends continuing into Ontario ('Project Pontiac). The anomalous VTEM zone covers the south-western portion of their project area, co-incident with their alteration corridor and possibly co-incident with untested drill targets and anomalous till samples.

Regional Geophysics

There are no known detailed airborne surveys available covering all or parts of the property, though there have been several regional magnetic and/or EM surveys dating back to the early noughties. All have wide line spacing and poor EM coverage density. The overall magnetic signature is weak/flat.

Survey files in Ontario include:

GDS1006 Blake River Syncline magnetic and EM surveys, Geophysical Data Set 1006, 2002

GDS 1022 KL Area Geophysical Data Set 1022 2002

GDS 1044A,B, Kidd-Munro Blake River Area MEGATEM® II Geophysical Data Set 1044 2003

GDS 1102A-1102D –(Rev) KL Area Geophysical Data Set 1102 – Revised 2003

MRD058.

MRD 162 Magnetic and gravity 3D modelling products, Discover Abitibi Initiative, 2005

MRD 196 Seismic Line 12 Report 2005

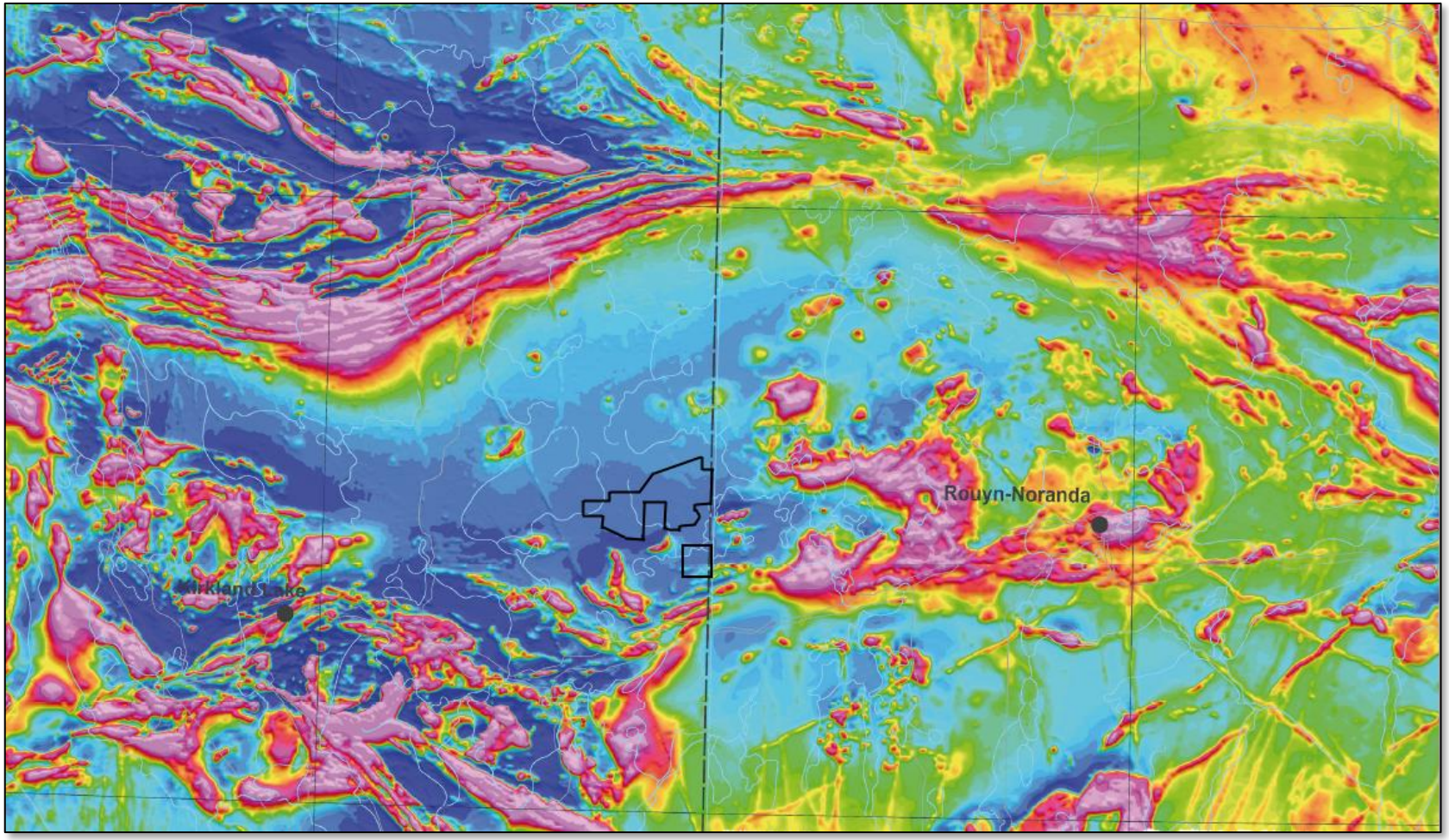


Figure 11 Regional Magnetic Data

Property outlined in black, location approximate

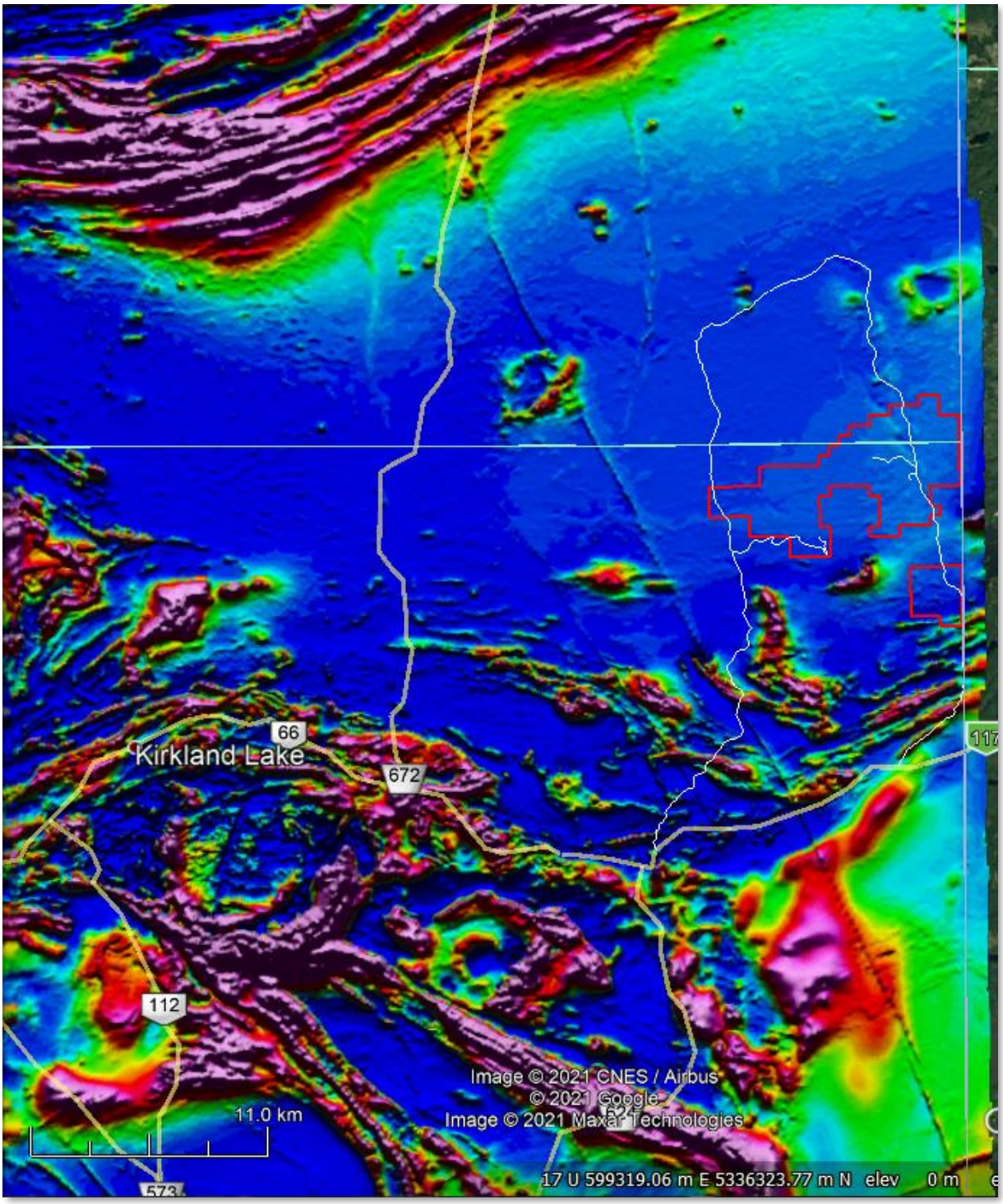


Figure 12 Regional residual magnetic data

Property outlines in red, (approximate), major roads in white

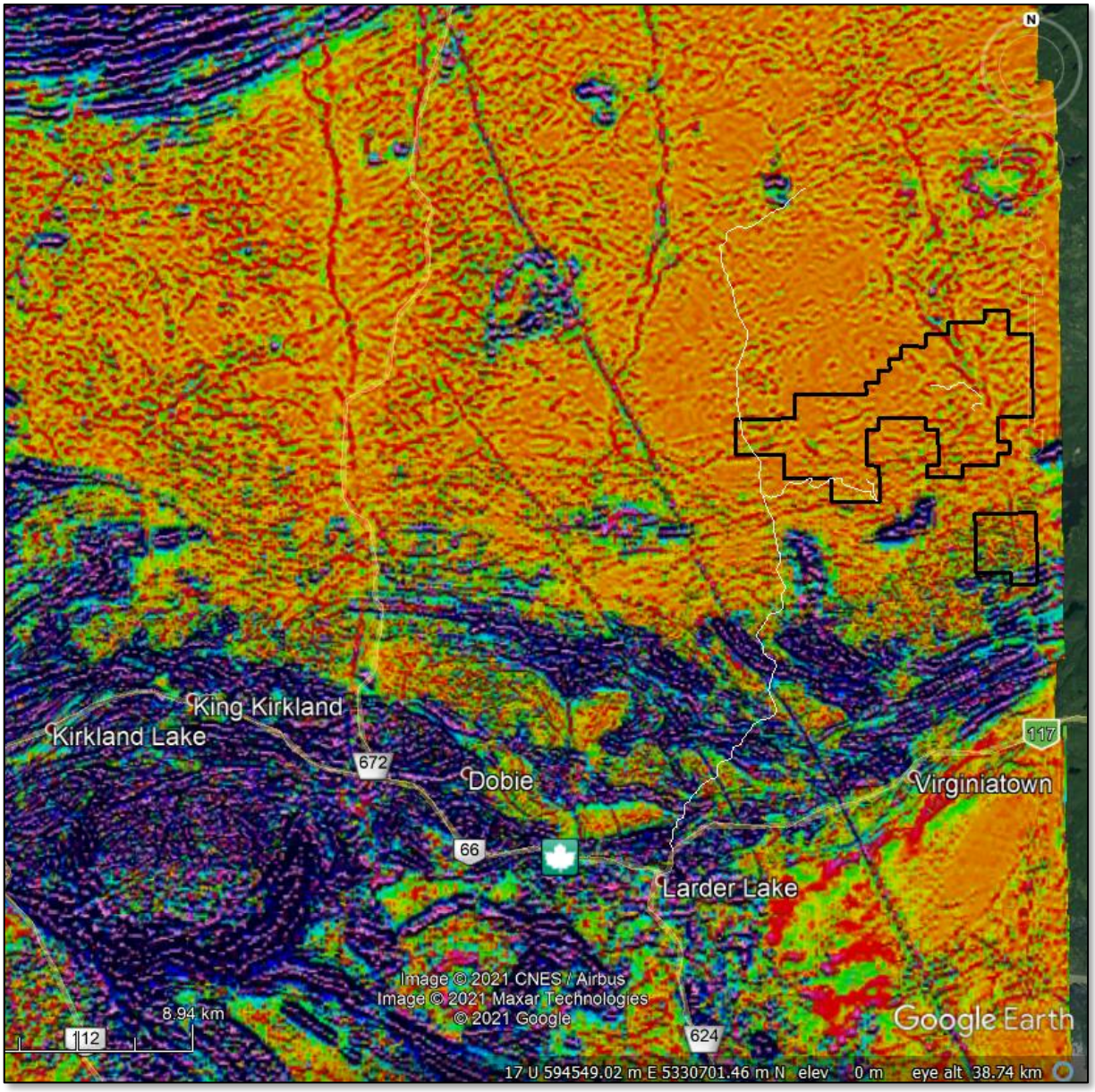
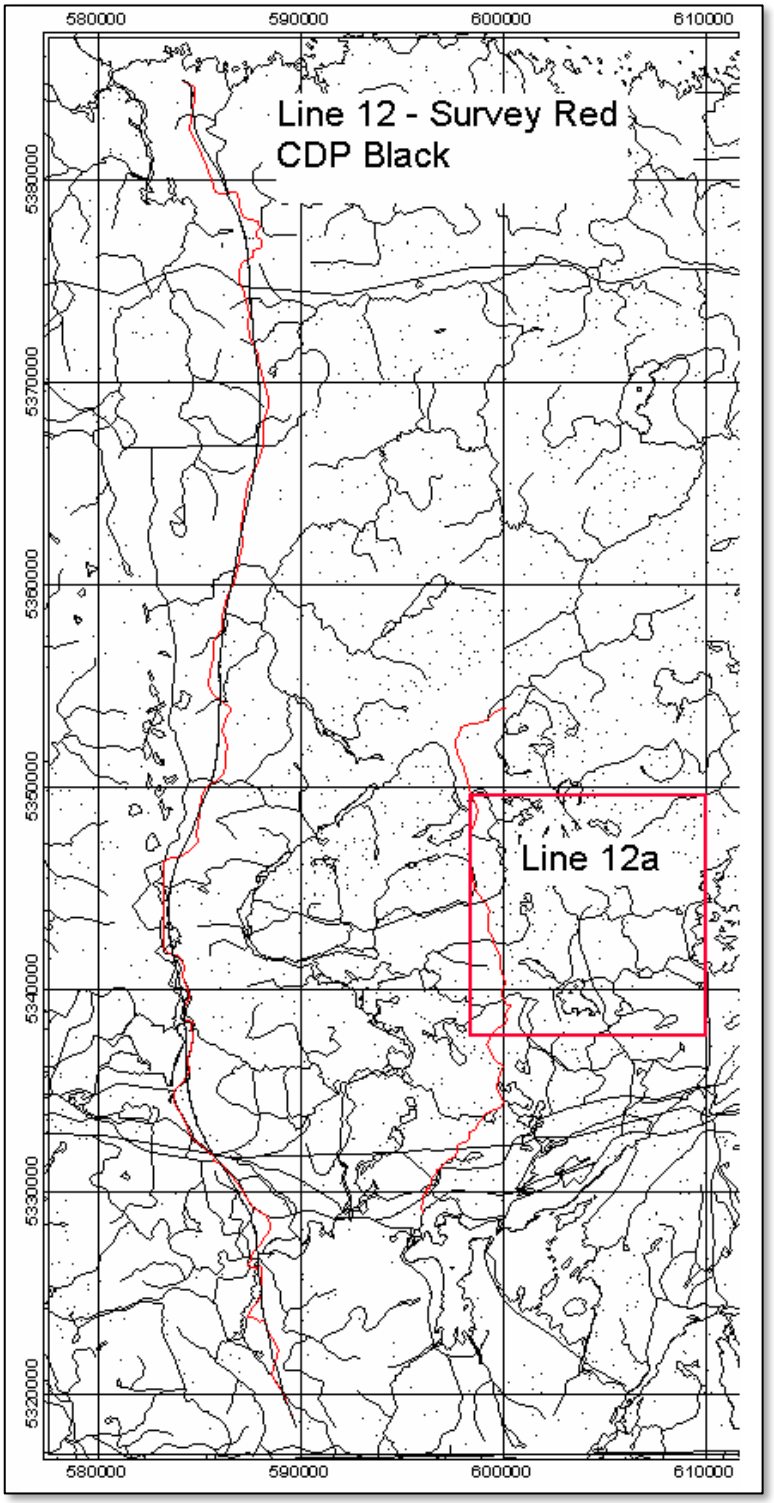


Figure 13 Regional 2VD magnetic data

Property outline in black, location approximate

Regional Lithoprobe Data



Pertinent regional data is available in OFR 6168, Reed et al., 2005. As part of the Discover Abitibi initiative, two-dimensional reflection seismic surveying in the Timmins-Kirkland Lake area. Previous work included the Lithoprobe surveys in the late 80's. Lithoprobe Kapuskasing Line 12 ran from south of the Quebec highway north along Highway 672 between Larder Lake and Kirkland Lake and across Highway 101. The transect is approximately 20 km from the centre of the TGM property. Data for Line 12 was re-processed and reported in Hajnal et al., MRD 163 2005. Line 12 A was run in the Lithoprobe transect programme, *but not re-processed by Hajnal et al*. The transect ran from Highway 67 north, along the Cheminis Rd., immediately west of the western TGM North block boundary. Follow-up studies included those by Jackson et al., 1990, 1995.

Left, locations of the Lithoprobe transects Kapuskasing lines 12 and 12A, (red lines) with red rectangle framing the TGM property area.

Figure 14 Lithoprobe transects

Below, re-processed data, from MRD 196:

Figure 5. Line 12, migrated seismic section with interpretation. Generalized geology profile at top is modified from Jackson et al. (1990); more detailed regional geology figure at bottom is from Reed et al. (2005a). North is to the left.

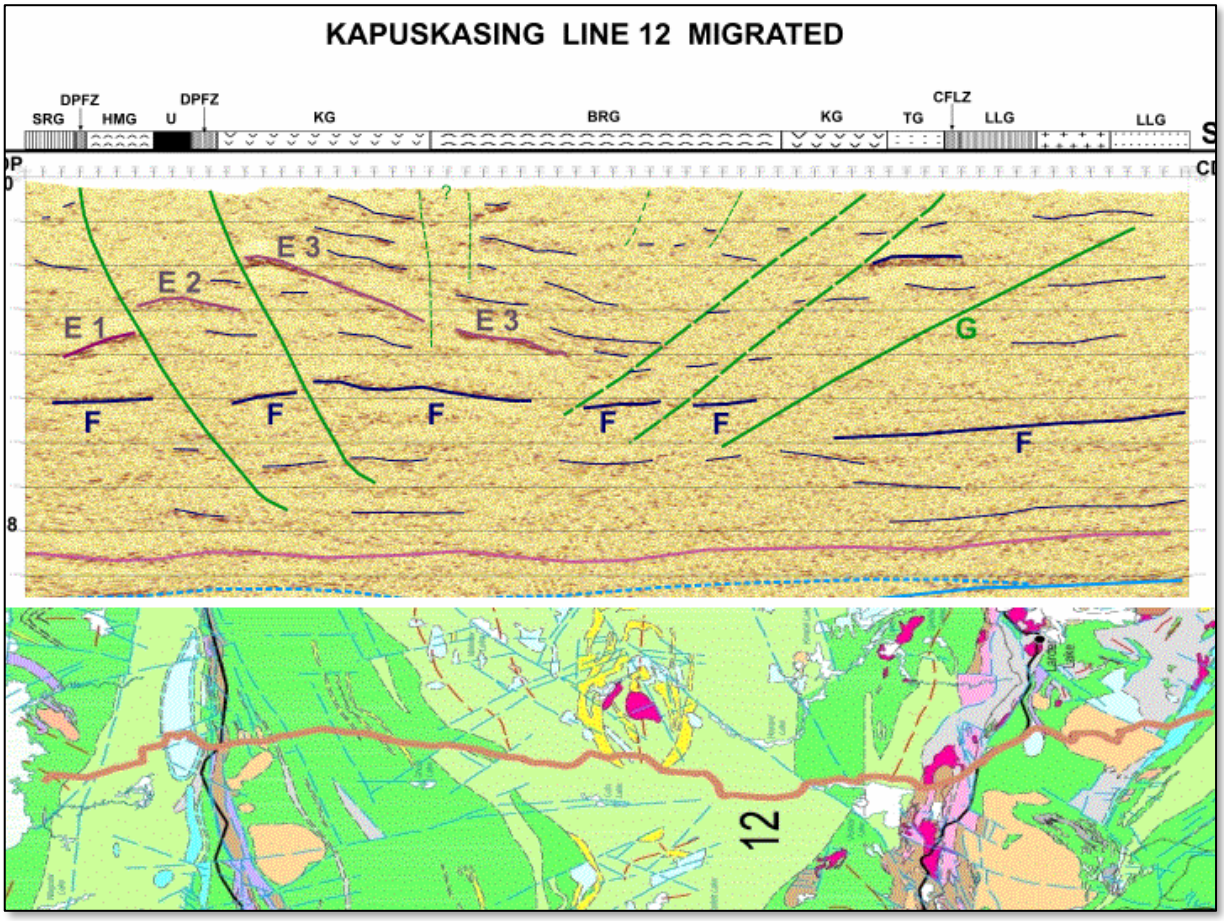


Figure 15 Kap' Line 12 data I

A summary of interpretation is as follows:

M1 is the top of the lower crust

M2 is the Moho discontinuity

E1 to F are prominent crustal reflections

The CLFZ (Cadillac-Larder FZ) and the TG (Timiskaming Gp sediments) form a 40° north-dipping, four to five km wide shear zone, detected to ca. 24 km depth. G is a fracture/shear zone traced to ca. 8 seconds depth. F may represent a 28-30 km basal detachment zone with the overlying crust allochthonous. "The overall structural framework has directly comparable features to the modern collision zones of the central Alps (Ellis et al. 1999; Pfiffner et al. 2000). The differences in the dips of the divergent fault zones suggest that the convergence was a more transpressional than compressional process." (Hajnal et al., 2005)

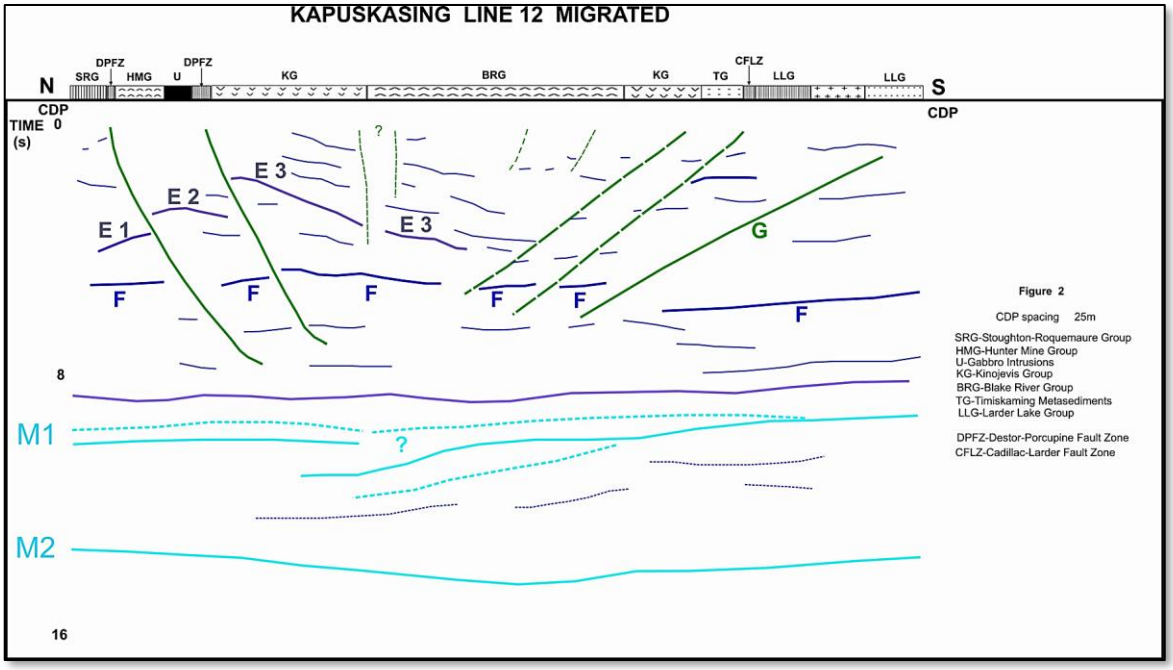


Figure 16 Kap Line 12 II

Earlier work on Transect 12A was reported by Jackson et al., 1995. Their abstract is as follows:

"Seismic reflection profiles from the southern Abitibi greenstone belt reveal four first-order subdivisions: (1) Between 0 and -4.5 s, the upper crust is weakly reflective, with prominent local to laterally extensive reflections. (2) Between -4 and -9 s, the crust is strongly and heterogeneously reflective with laterally continuous reflections. (3) From -9 to - 13 s, the crust is more homogeneously reflective and displays downward decreasing reflectivity. (4) Below - 13 s (Moho?) the upper mantle is weakly reflective. The upper layer may correspond to subgreenschist-greenschist-facies supracrustal rocks cut by low-angle shear zones and intruded by regional tabular batholiths; the middle layer, to ductiley deformed amphibolite-facies gneisses, granitoids, and (or) metasediments; and the lower layer, to more homogeneously deformed granulite-facies rocks. North-dipping, low-angle reflections extending beneath both diverse supracrustal assemblages and regional batholiths may represent structural detachments upon which both the supracrustal assemblages and batholiths were imbricated and translated southward. However, the preservation of regional low-pressure metamorphic rocks and the common para-autochthonous relationships between assemblages suggest that thrust-related vertical separations and the magnitude of crustal thickening were not large. Steeply dipping regional shear zones within the greenstone belt appear to disrupt subhorizontal reflections down to - 15 km and may represent late-tectonic strains, which were progressively concentrated into linear zones during continued north-south shortening. The crustal-scale structure determined from the seismic reflection profiles, combined with surface geology, is compatible with post-2.70 Ga north-south shortening accommodated by south-directed(?) thrusting in a thermally softened mid crust and by upright folding in the upper crust. This scenario is comparable to recently

proposed models for the Paleozoic, high-temperature, low-pressure Lachlan fold belt of Australia."

From Jackson et al., 1995:

"Line 12A is a high-resolution line recorded to a depth of 8 s. Between 0 and -4 s numerous prominent reflections are within otherwise low-reflectivity material. Below -4 s the crust shows stronger, more homogeneous reflectivity with several prominent reflections. The southern part of line 12A displays gently to moderately north-dipping reflections in the upper 5 s of the profile. Beneath 5 s, and at all depths on the north part of the line, reflections are sub-horizontal. In the north half of the profile, beneath the Blake River assemblage, numerous sub-horizontal reflections occur between 0 and -8 s. Reflection e-e' (Fig. 4b) projects to surface near the Blake River assemblage - Kinojevis assemblage boundary and the Crosby Lake gabbro. Units of the Blake River and Kinojevis assemblages, and compositional heterogeneities in the gabbro, are all shallowly to moderately north dipping in this region. These features, individually or collectively, may account for reflection e - e'. A prominent sub-horizontal reflection beneath the Blake River assemblage (reflector k-k' of Fig. 4b) may delimit the base of the Blake River assemblage. If e -e' and k- k' delimit the approximate base of the assemblage, then its maximum depth or thickness is 2 s (6 km). Reflections beneath the surface trace of the Misema - Mist Lakes fault terminate sharply and may delimit the subsurface trace of the fault to a depth of approximately 10 km; however, no large displacement has been recognized at surface."

"There is no apparent disruption of reflection g-g' (Fig. 4b) beneath the Cadillac - Larder Lake shear zone in profile 12A. This supports the interpretation from profile 23 that the Larder Lake - Cadillac shear zone dips steeply south.

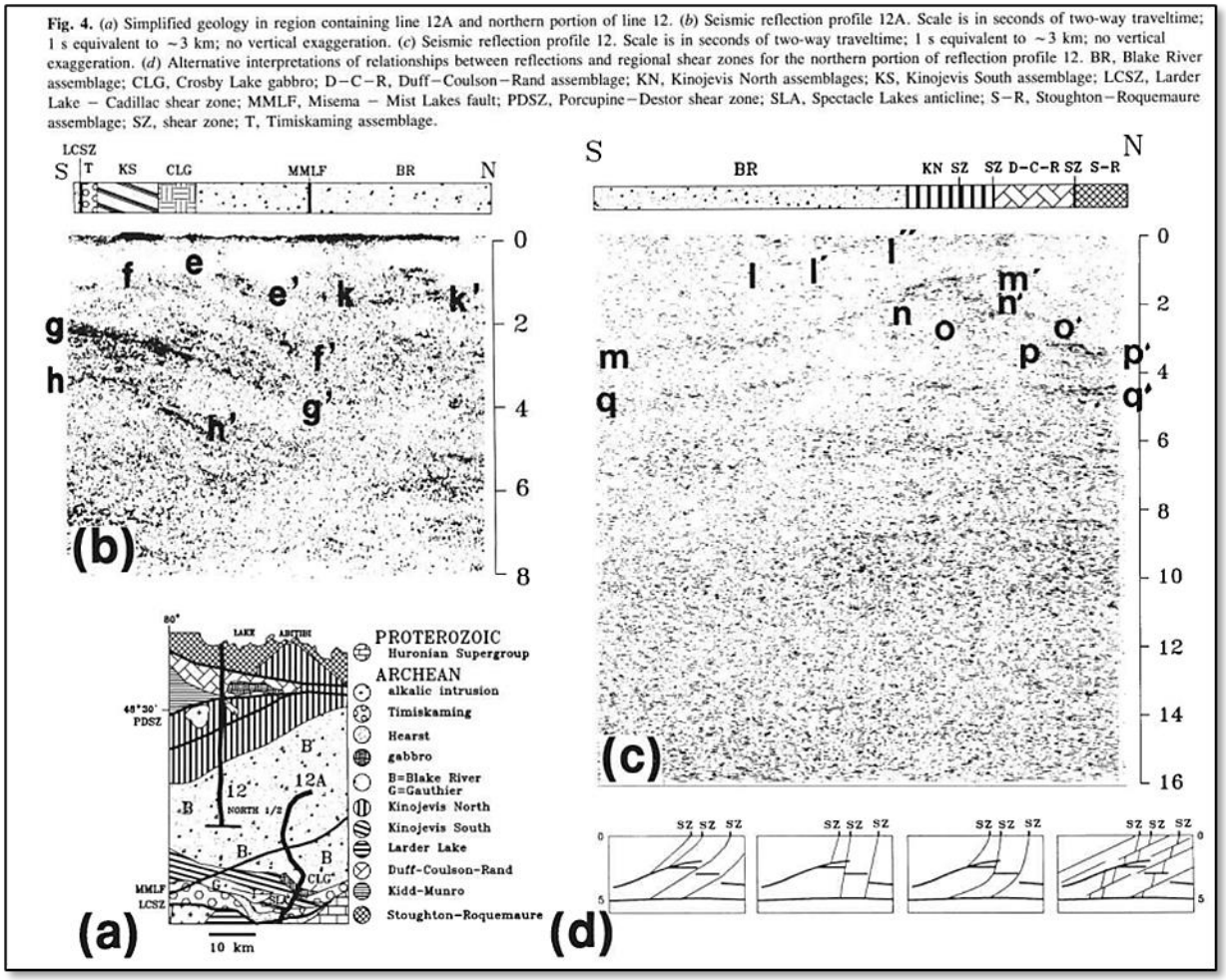


Fig. 4. (*a*) Simplified geology in region containing line 12A and northern portion of line 12. (*b*) Seismic reflection profile 12A. Scale is in seconds of two-way traveltime; 1 s equivalent to ~3 km; no vertical exaggeration. (*c*) Seismic reflection profile 12. Scale is in seconds of two-way traveltime; 1 s equivalent to ~3 km; no vertical exaggeration. (*d*) Alternative interpretations of relationships between reflections and regional shear zones for the northern portion of reflection profile 12. BR, Blake River assemblage; CLG, Crosby Lake gabbro; D–C–R, Duff–Coulson–Rand assemblage; KN, Kinojevis North assemblages; KS, Kinojevis South assemblage; LCSZ, Larder Lake – Cadillac shear zone; MMLF, Misema – Mist Lakes fault; PDSZ, Porcupine–Destor shear zone; SLA, Spectacle Lakes anticline; S–R, Stoughton–Roquemaure assemblage; SZ, shear zone; T, Timiskaming assemblage.

Figure 17 Seismic Profile Line 12A

The TGM property area (North block) would straddle 'MMLF', (fig. 60 above), the Misema-Mist Lake Fault.

"(1) major mid-crustal reflections extending over distances of tens of kilometres likely represent sub-horizontal shear zones that imbricate the supracrustal and granitoid rocks of the greenstone belt; (2) the base of Blake River assemblage is imaged and suggests that the assemblage is a thin, dish-shaped synclinorium; however, we interpret the synclinorium to be fault bounded and either allochthonous or para-autochthonous; (3) the Lake Abitibi Batholith is underlain by regional sub-horizontal shear zones; (4) major east -west-striking shear zones such as the Lincoln - Nipissing, Larder Lake - Cadillac, and Porcupine - Destor are manifest as discontinuities in sub-horizontal reflectors and may extend down to 10- 15 km, where they either sole out or are truncated by younger structures." Jackson et al., 1995

MINERAL OCCURRENCES

MDI OCCURRENCES – from Govt. files. The compilation includes many off property and are noted if such is the case

1. Deposit: MDI000000000601 Gagnes – 1996 OFF PROPERTY
Deposit Status Occurrence
Primary Commodity: Au
Township or Area: Katrine
Latitude: 48° 12' 30.51" Longitude: -79° 38' 12.83”
UTM Zone: 17 Easting: 601270 Northing: 534370 UTM Datum: NAD83 NTS 32D04NE
Location Method: Based on Assessment
Source Map: Midpoint of 3 trenches/pits – plotted on map 2061 ± 100 metres.
Pt. Location Description: Mid-point of 3 trenches/pits - plotted on map 2061
Exploration and Mining History
1930s: This was probably part of the Callighan property located on Mulven Lake and north of the Walsh-Katrine property.
1969: Stripping and trenching by Ribar.
1996: Trenching and sampling by Gagne. Best gold assay was 17,246 ppb Au in pit 2.
Assess. Work File No. KL-4027 and KL-2360
References:
Arnold and Katrine Townships; ODM Geological Report 29, 15p. accompanied by map 2061, scale 1:31680
Publication Number: GR 29 Scale: 1:31 680 Date: 1964 Hogg, W.A.

2. Deposit: MDI32D05SE00045 Roche-south - 1964, Roche Prospect – 1927 OFF PROPERTY
Deposit Status Developed prospect without reserves
Abandoned Mine Inventory Reference 08134
Primary Commodities: zinc, copper, lead
Secondary Commodities: silver, gold
Township or Area: Ben Nevis
Latitude: 48° 19' 9.94" Longitude: -79° 39' 46.75"
UTM Zone: 17 Easting: 599117 Northing: 5352668 NAD83 32D05SE
Point Location Description: shaft
Location Method: AMIS site visit
Access Description: Proceed 1km east of Larder Lake on Hwy 66 to Larder Station Road/Pontiac Access Road. Continue for 27.9km north to Interprovincial Mine Road. Site is 1km on the Interprovincial Mine Road.
Exploration and Mining History
1927: P.J. Roche Property - pitting, trenching, sampling. 1927-32: Interprovincial Exploration Company Ltd. - property examination of underground workings; shaft sinking; 3 levels established.
Mineral Deposit Inventory Record MDI32D05SE00045: Roche-south, Roche Prospect

www.geologyontario.mndm.gov.on.ca/mndmfiles/MDI/data/records/MDI32D05SE00045.html 2/4
1960: Hollinger Mines Ltd. – mapping
1962-63: Canagau Mines Limited - trenching, stripping, sampling.
1964: Dome Exploration Limited and Frobex Limited - DD-6-1971 ft.
1992: Minnova Inc. -geological mapping, sampling.
2002: Wallbridge Mining Company Limited - drill core sampling
Assessment Work on File

Office	Online Assessment	Online Assesment
File Number	File Identifier	File Directory
KL-1288/15	32D05SE0070	Open
2.24872	32D05SE2022	Open
2.14827	32D05SE0023	Open
KL-2400		
KL-1288/63.3901	32D05SE0055	Open

Geology

Rock Type	Composition	Texture	Relationship
Felsic volcanics	Rhyodacite	Silicified, carbonatised	host
Mafic intrusive	Gabbro		adjacent

Mineralisation

Deposit Mineralisation & Alteration
Quartz-galena-sphalerite-pyrite
01/22/2016 (A Wilson) - Galena and sphalerite were observed to occur along strongly pyritized, vertical, east-striking shear plans. A sample collected from the pit by Sakinaw Copper and Iron Mining Limited assayed 0.67% Pb, 0.03% Zn, 0.34 g/t Au and 19.5 g/t Ag. The shear zone was intersected below the surface by Frobex Limited. DDH F64-1 intersected 94.3 g/t Ag, 0.83% Pb and 1.95% Zn over a core length of 23.3 ft. Hole F64-6 intersected 43.2 g/t Au, 0.08% Pb and 0.25% Zn over a core length of 11 feet. A grab sample from surface collected by P.E. Roche assayed 0.11 oz./t gold. A sample collected from the shaft on the lead-zinc vein returned values of0.52% Pb, 5.6 oz./t Ag, 0.84% Cu and 10.38% Zn. A sample collected by P. J. Roche in 1927 assayed 0.02 oz/t Au, 0.34 oz/t Ag, 0.15% Cu, 30.29% Pb and 9.57% Zn. In the Company's records samples from underground included: 80 Ib. sample - 3.40 oz. Ag., 6.46% Zn and 3.76%Pb. Massive sulphides (no weight) - 1.10 oz. Ag., 17% Zn and 0.33% Pb. Assays from the Mountain Lake Resources and Joutel Resources Ltd. returned zinc values ranging from 141 to20,6000 ppm, 71 ppm to 2400 ppm Pb, 7 to 4790 ppm Cu.

References

Geology of Clifford and Ben Nevis Townships, p. 43-44 OGS R132, 1975 L.S. Jensen
Book - Geochemical exploration of Early Precambrian volcanogenic sulphide mineralisation in Ben Nevis Township, District of Cochrane OGS S019 Date: 1977, W.J. Wolfe
Ben Nevis, Munro, Kamiskotia, and Other Base Metal Areas, p. 25 ODM ARV37-3, 1929 T.L. Gledhill
Map - Clifford and Ben Nevis Townships M2283 Scale: 1:31 680 Date: 1975

3. MDI32D05SE00040 Roche-north - 1926, Sakinaw - 1952, Goldmac Silver Property – 1984 OFF PROPERTY

Deposit Status: Occurrence
Commodities: Ag, Au, Zn and minor Pb
Township: Ben Nevis
Latitude: 48° 19' 40.44" Longitude: -79° 40' 27.67"
UTM Zone 17 Easting: 598258 Northing: 5353595 NAD83 32D05SE
Point Location Description: Outcrop
Location Method: field visit with GPS
Source Map: M2283

Exploration and Mining History

1965: P.J. Roche – DD-1-398 ft., assays. 1965: Dome Exploration Limited – IP survey, DD-1 - 398ft.
1971-73: Amax Exploration Inc. – airborne geophysics, DD-9 - 3460 ft., assays.
1980-84: Goldmac Explorations Ltd. – mapping, magnetometer, VLF-EM surveys; surface sampling; radiometric survey; DD-5-1269 ft.
1998: Joutel Resources Ltd. – airborne geophysics.
2002: Wallbridge Mining Company Limited. – reconnaissance mapping and relogging core.

Assessment Work on File

Office File No.	Online Assess. File Identifier	Online Assessment
KL-0025/ 2.975	32D05SE0017	Open
KL-0025/ 13	32D05SE0072	Open
KL-0025/ 12	32D05SE0073	Open
KL-0025/ 14	32D05SE0685	Open
KL-0693/ 63.1984	32D05SE006	
KL-1094/2.13123	32D05SE0007	Open
KL-1094/ 2.4987	32D05SE0045	Open
KL-1094/ 17	32D05SE0046	Open
KL-1094/ 63.3803	32D05SE0050	Open
KL-1094/ 2.3388	32D05SE0053	Open
2.24872	32D05SE2022	Open
2.3118	32D05SE005	
KL-0025/2.448	32D05SE0016	Open
KL-1094/ 2.6926	32D05SE0044	Open
KL-0693/ 18	32D05SE0059	Open

Geology

Tectonic Assemblage: Blake River

Mineral Deposit Lithology

Rock Type	Composition	Texture	Relationship	
felsic volcanics	Rhyolitic	Brecciated, silicified	host Int. volcanics	Dacite
Massive, porphyritic	host			

Deposit Mineralisation and Alteration

Galena-pyrite-sphalerite-quartz

Mineralisation Comments

01/06/2016 (A Wilson) - Zinc values in DDH TX-101-73 ranged from 129 to 8400 ppm, over widths of 1 to 1.5 ft. Copper values ranged from 41 to 405 ppm over widths of 1 to 1.5 ft. Assays from the1965 drilling program returned silver values ranging from 0.18 oz./t over2 ft. to 0.56 oz./t over 2.0 ft. The intersection returning 0.56 oz./t Ag also intersected 0.28 oz./t Pb. Grab samples taken from the (?)-'ledge' by Goldmac Explorations in 1982 assayed 0.85 oz./ton Ag to 16.6 oz./ton Ag, trace to 0.019oz./ton Au, 0.01% to 1.272 Zn, and 0.03% to 2.04% Pb.

Site Visit Information

June 2017 (J. Suma-Momoh): Rhyolite and rhyodacitic rocks underlie the property. The showing trends 227° and the entire surface displays sulphide staining. It is brecciated and with fragments almost like stretched pillows. There is a general deformation fabric oriented at about 280°. A creek, possibly, along the Murdock Creek – Kennedy Lake fault (with water flowing to the northeast) is located at the eastern edge of the outcrop. Sulphide mineralisation is mainly semi-massive to massive pyrite, with small amounts of chalcopyrite. Samples collected from the outcrop returned the following assays: JSM-17-57: 2.7 oz/t silver, < 0.016 oz/t gold; JSM-17-58: 5.2 oz/t silver, 0.018 oz/t gold; and JSM-17-59: < 0.1 oz/t silver, < 0.016 oz/t gold.

References

Geology of Clifford and Ben Nevis Townships, 1975. p. 43-44 OGS Publication Number: r132 L.S. Jensen

Geochemical Exploration of Early Precambrian Volcanogenic Sulphide Mineralisation in Ben Nevis Township, 1977 39p. OGS Publication Number: S019 W.J. Wolfe

Preliminary report on the Timmins-Kirkland Lake area, gold deposits file, OGS #G0087 Publication No: OFR5467, 1983, C.J. Hodgson

Map Geology of Clifford and Ben Nevis Townships, 1975 Publication Number: M2283 Scale: 1:31 680

4. MDI32D04NE00002 Ossian – 1981, Mindel – 1981 Adjacent to TGM North block ground, on patented claims

Deposit Status Prospect

Commodities Gold

Township: Ossian

Lat. 48° 14' 49.45" Long. -79° 35' 26.98"

UTM E604614 N534722 NAD 83 32D04NE

Point Location Description Shaft

Location Method Conversion from MDI

Source Map OGS 1971, P630 Ossian Tp.

Exploration History

1920's - Gold bearing quartz vein exposed on the property.

1925 - Trenching and surface diamond drilling by Ossian Gold Mines Limited. 19 holes totalling 5421 feet. Best assays from holes #7 and #9 - 0.84 opt Au/10.7 feet and 0.698 opt Au/10 feet respectively.

1926-1927 - Ossian Gold Mines Limited sank a 210-foot shaft with levels at 90 and 200 feet. Lateral development was 600 feet on the 90 ft level, including 480 ft on the quartz zone and 450 feet on the 200-foot level.

1928 - P.E. Hopkins was hired to re-evaluate the sampling. Best assay underground on 90' level was 0.08 opt Au/4.6 feet and on the 200' level to be 0.125 opt Au/3.5feet.

1934 - Dump material sent to Noranda for testing and averaged 0.03 opt Au and 0.02 opt Ag. Selective dump material averaged 0.125 opt Au and 0.12 opt Ag. 1935-1936 - 5-hole diamond drill program by Ossian Gold Mines Limited to check out original holes. Best result was0.38 opt Au/2.8 feet.

1939 - Sylvanite Gold Mines Limited examined the surface trenches. A channel sample from 15' west of the shaft returned 0.63 opt Au/4 feet.

1949 – Paymaster Consolidated Mines Limited surface mapped and sampled the old trenches. A sample from a trench returned 1.47 opt Au/2 feet. 13 grab samples were taken from the quartz shaft dump. The average was 0.09 opt Au and the dump contained an estimated 1055 tons of material.

1975- Minedel Mines Limited has the old surface and mine plans reviewed. It was concluded the surface data was reliable but no the underground. An airborne magnetic survey was conducted on the property.

1976 -Ground mag and EM surveys.

1993 - Crow Geological Surveys Inc. cut as mall grid centred on the shaft. Ground mag and VLF-EM surveys were completed.

1996 - Silver Century Explorations Ltd. completed ground mag, VLF-EM, IP and geological surveys and channel sampling. -- 8.18 ppm Au/4.2 m, 4.32 ppm Au/2.7m and 3.0 ppm Au/3.9m 1997 - 6ddh totalling 1390 m - best 4.59 ppm Au/2.72m and 1.12 ppm Au/6.15.

Assessment Work on File

Office File Number

KL-4406

KL-1875

KL-2164

KL-4613

Mineralisation

Quartz-py-sericite-calcite

References

Map - PONTIAC AND OSSIAN TWPS, ODM Map 2296 Scale: 1:31 680 Date: 1974

Book - OGS 1972, OFR 5081, P58-59 Publication Number: OFR 5081 Date: 1972 Jensen, L.S.

Book - OGS 1975, GR 125 P30-31, GEOLOGY OF PONTIAC & OSSIAN TWP Jensen, L.S.

Book - OGS 1979, MDC 18, P160, 1979 GOLD DEPOSITS OF ONTARIO Pt2 Gordon, J.B. et al

Book - OGS 1983, OFR 5467 #G0111 Hodgson, C.J.

Book - RES/REG PROPERTY VISIT KL #399 PV-399 Date: 1988 Lovell, H.L.

5. MDI32D04NE00019 Culhane – 1995
Deposit status Discretionary occurrence
Primary commodity Au
Secondary commodity Ag
Location Ossian Tp.
Latitude: 48° 16' 28.4" Longitude: --79° 34' 54.91"
UTM Zone: 17 Easting: 605219 Northing: 5347789 NAD83 32D04NE
Point Location Description: Sample #5.
Location Method: conversion from mdi
Source Map: RES.GEOL.ASSESS.FILE RPT KL#3117 SAMPLE LOC MAP
Assessment Work on File
Office File Number
KL-3117
Mineralisation None
References
OGS GR 29, 1975

6. MDI32D05SE00019 Culhane -1 - 1995
Deposit Status Occurrence
Primary commodities Au, Ag
Location: Pontiac Tp.
Latitude: 48° 16' 43.53" Longitude: -79° 33' 29.57"
Zone 17 E606969 N5348289 NAD 83 32D05SE
Location method GPS field visit
Source Map OGS GR 125 Map 2296 Pontiac & Ossian tps.
Exploration and Mining History
1972: Kerr Addison Mines completed ground magnetic and electromagnetic surveys. They picked up several Keweenawan dykes.
1989-1990: K. Culhane sampled quartz veins south of and east of Sunshine Lake. 1990: Orofino Resources completed a lithogeochemical survey and ground geophysics to the west and north.
Assessment Work on File

Office File Number	**Online Assessment File Identifier**	**Online Assessment File Directory**
KL-03073	**2.14427**	**Open**
KL-3117	**63.5911**	**Open**
KL-1390	**63.3029**	**Open**

Mineral Deposit Lithology

Rock Type	Composition	Relationship
felsic volcanics	rhyolite	near
Intermediate volcanics	dacite	near
vein	quartz	host

Mineralisation
Quartz gangue ***This is not an occurrence***

Notes: Property visited July 5 2012 with C. Beaudoin. No outcrop noted in area of MDI32D05SE00020 and road no longer passes through/by this MDI point. Sample collected about 250 m to the west of the point as located, although I believe the accuracy of the point location may be several 100 of metres.
Sample ?site 731865 in 2012 Pontiac Township Culhane-1 - pillowed calc-alkalic andesites at UTM Zone 17 E606706 N 5348328 Sample ?-site 731866 in 2012 Pontiac Culhane-1 - pillowed calc-alkalic andesites at UTM Zone 17 E606706 N5348328
Samples collected Sample Number 12BB008A Pontiac Township NAD 83 UTM Zone 17 UTM East 606706 North 5348328 on Culhane-1, MDI Number MDI32D05SE00019 ANALYSES grab; whole rock; Au; base metals

References

Book - OGS 1975 GR 125, 1975

Map - Geological Compilation of the Central Abitibi Greenstone Belt: Kapuskasing Structural Zone to the Quebec Border

Publication Number: OGS P3635 **Scale:** 1:250 000 2005 J.A. Ayer, B.R., Berger, L.A.F. Hall, M.G., Houlé, G.W. Johns, S.D. Josey, Z.B. M

Map - Pontiac and Ossian Townships ODM M2296 **Scale:** 1:31 680, 1974 Jensen, L.S.

7. MDI32D05SE00020 Culhane- 2 – 1995

Deposit status Occurrence
Primary Commodity Au
Location Pontiac Tp.
Latitude: 48° 16' 50.01" Longitude: --79° 33' 29.63"
UTM Zone: 17 Easting: 606964 Northing: 5348489 UTM Datum: NAD83 NTS Grid: 32D05SE
Point Location Description: Sample
Location Method: conversion from mdi
Source Map: OGS 1975 GR 125 MAP 2296 PONTIAC AND OSSIAN TPS

Assessment Work on File

Office File No.
KL-3117
KL-1390

Mineralisation

Quartz – gangue ***This is not an occurrence***

References

OGS GR 125 1975

8. MDI32D04NW00042 Silver Century – 1998, Ossian Gold Mine - 1922

Deposit status Occurrence
Primary commodity Zn
Location Ossian Tp.
Latitude: 48° 14' 43.75" Longitude: --79° 34' 26.28"
UTM Zone: 17 Easting: 605869 Northing: 5344569 UTM Datum: NAD83
Resident Geologist District: Kirkland NTS Grid: 32D04NE
Point Location Description: Diamond drill hole OGM98-8

Location Method: based on assessment
Source Map: DRILL HOLE FROM MAP KL4668-3
Source Map Accuracy: Within 100 metres
Access Description: Property is about 12 km north of Virginiatown. A former logging road allows ATV access from Virginiatown to near Mist Lake in northwest Ossian Twp. The road crosses the southwest portion of the property about 1400 m south-west of the shaft. The drill hole is about 1.5 km east of the Ossian Gold Mine shaft.

Exploration and Mining History

1920's - Gold bearing quartz vein exposed on the property.
1925 - Trenching and surface diamond drilling by Ossian Gold Mines Limited. 19 holes totalling 5421 feet. Best assays from holes #7 and #9 - 0.84 opt Au/10.7 feet and 0.698 opt Au/10 feet respectively.
1926-1927 - Ossian Gold Mines Limited sank a 210-foot shaft with levels at 90 and 200 feet. Lateral development was 600 feet on the 90 ft level, including 480 ft on the quartz zone and 450 feet on the 200-foot level.
1975 - Minedel Mines Limited had the old surface and mine plans reviewed. It was concluded the surface data was reliable but not the underground. An airborne magnetic survey was conducted over the property.
1976 -Ground mag and EM surveys.
1993 – Crow Geological Surveys Inc. cut a small grid centred on the shaft. Ground mag and VLF-EM surveys were completed.
1996 - Silver Century Explorations Ltd. completed ground mag, VLF-EM, IP and geological surveys and channel sampling. -- 8.18 ppm Au/4.2 m, 4.32 ppm Au/2.7m and 3.0ppm Au/3.9m
1997 - 6 ddh's totalling 1390 m - best 4.59 ppm Au/2.72m and 1.12 ppm Au/6.15
1998 - Silver Century drilled 2 holes totalling 1076m. Hole OGM98-8 intersected 0.22%Zn/13.5m. Also, downhole EM and surface IP.
Assessment Work on File
Office File Number
KL-2164
KL-4406
KL-4613
KL-4668

Geology Possibly related to the ?regional 030 striking Mulven Lake Fault. Within the Blake River volcanic assemblage, massive bleached, pyritic mafic volcanic rocks. Felsic intrusions locally, with silica-epidote alteration in breccia. Massive mafic volcanic rocks in HW and FW.
05/10/2001 (D. Guindon) - Brief drill log: 0 - 40 m - casing, 40 - 375 m - mafic volcanics, 377 -395 m - intermediate lapilli tuff, 395 - 517 m felsic volcanics, 517 - 537 m intermediate lapilli tuff, 537 - 570 m mafic volcanics, 129-130.5 m - 6685 ppm Zn, 130.5-132 m - 5816 ppm Zn, 139.5-141 m - 7910 ppm Zn, 490.5-492 m - 5000 ppm Zn.

References

ODM Map 2296 Pontiac and Ossian Tp, 1974
ODM GR 125 Geology of Pontiac and Ossian Tp, 40 p. 1975. L.S. Jensen

9. MDI32D04NW00034 Fockler-Little-Lowe-Garvie – 1981 OFF PROPERTY
Deposit status occurrence
Primary commodity Au and minor Cu
Location: Arnold Tp.
Latitude: 48° 13' 52.3" Longitude: --79° 45' 42.44"
UTM Zone: 17 Easting: 591951 Northing: 5342738 UTM Datum: NAD83 32D04NW
Point Location Description: Diamond drill hole
Location Method: conversion from mdi
Source Map: OGS 1964, MAP 2061 ARNOLD AND KATRINE TP IN GR 29
Assessment Work on File
Office File Number Online Assessment File Identifier Online Assessment File Directory
KL-0859
Geology Previously assigned to the Kinojevis South Group, now the ?Lower Blake River assemblage.
Mineralisation
Graphite-pyrite-quartz 'gangue'.
References
OGS GR 29, 1964, Hogg. W.A.
OGS MDC 18, 1979 , Gordon, J.B. et al
OGS OFR 5467, 1983. Hodgson, C.J.

10. MDI32D04NE00034 Tresdor Larder – 1991 OFF PROPERTY
Deposit status Occurrence
Primary commodity Cu
Location McGarry, Ossian tps.
Latitude: 48° 11' 17.1" Longitude: --79° 33' 21.49"
UTM Zone: 17 Easting: 607325 Northing: 5338214 NAD83 32D04NE
Point Location Description: Diamond drill hole #1.
Location Method: conversion from mdi
Source Map: OGS 1979 DATA SERIES MAP P862
Assessment Work on File
Office File Number Online Assessment File Identifier Online Assessment File Directory
KL-2716
Mineralisation
Quartz-epidote gangue
References
OGS GR 125, 1975

11. MDI32D04NE00033 Noranda Grp. 1-76 – 1991
Deposit status Occurrence
Commodities Cu-Zn
Location Ossian Tp.
UTM Zone: 17 Easting: 606959 Northing: 5340734 NAD83 32D04NE
Point Location Description: Diamond drill hole 78-1.

Location Method: conversion from mdi
Source Map: OGS 1979 DATA SERIES MAP P862 REV
Assessment Work on File
Office File Number
KL-2094
Mineralisation
Chl-qz-tremolite-carbonate-pyrite-calcite
References OGS GR 125, 1975

12. MDI32D04NE00032 Candore – 1991 OFF PROPERTY
Deposit status Occurrence
Commodity Cu
Location Ossian Tp.
Latitude: 48° 11' 34.8" Longitude: --79° 32' 8.47"
UTM Zone: 17 Easting: 608822 Northing: 5338789 UTM NAD83 32D04NE
Point Location Description: Diamond drill hole
Location Method: conversion from mdi
Source Map: OGS 1979 DATA SERIES MAP P862 REV
Assessment Work on File
Office File Number
KL-0848
KL-0438
Mineralisation
Qz-pyrite-po-calcite
References
OGS GR 25 1975

13. MDI32D04NE00030 Lowe Katrine -1991 (?= NLG Norwood) OFF PROPERTY
Deposit status Occurrence
Primary commodity Au
Secondary commodity Cu
Location Katrine Tp.
UTM Zone: 17 Easting: 596460 Northing: 5343804 UTM Datum: NAD83 32D04NE
Point Location Description: Diamond drill hole #1.
Location Method: conversion from mdi
Source Map: RES.GEOL.ASSESS.FILE KL #1653 DDH LOC MAP
Assessment Work on File
Office File Number
KL-1644
KL-1653
Mineralisation
Pyrite-po-qz
References
OGS MDC 18, 1979 Gordon, J.B. et al.

14. MDI32D04NE00029 Forward – 1991, Anderson, T. – 1991, Misema Lake – 1991 OFF PROPERTY

Deposit status Occurrence
Primary commodity Cu
Location Katrine Tp.
Latitude: 48° 11' 37.66" Longitude: --79° 43' 51.8"
UTM Zone: 17 Easting: 594302 Northing: 5338618 NAD83 32D04NE
Point Location Description: Shaft
Location Method: conversion from mdi
Source Map: OGS 1963 PRELIM MAP P170

Assessment Work on File

Office File Number
KL-0876

Mineralisation

Qz-py-po

References

OGS MDC 2, 1957 Hogg, W.A.
OGS GR 29, 1964, Hogg, W.A.

15. MDI32D04NE00024 Walsh-Katrine – 1987, Wadge – 1987, Walsh-Tucker – 1987 OFF PROPERTY

Deposit status Developed prospect without reserves
Primary commodity Au
Secondary commodity Cu, Pb
Location Katrine, Ossian tps.
Latitude: 48° 12' 12.21" Longitude: -79° 37' 50.64"
UTM Zone: 17 Easting: 601738 Northing: 5339813 UTM Datum: NAD83 32D04NE
Point Location Description: Shaft in Katrine tp.
Location Method: field visit with GPS
Source Map Accuracy: Within 10 metres

Exploration & Mining History

The property was originally staked during the 1906-1907 Larder Lake gold rush and was subsequently re-staked and explored several times.

Walsh Katrine Gold Mines Limited sank a two-compartment shaft to a depth of 515 feet in 1924 with levels at 140', 250', 375', and 500' depths.

In 1933, two ore samples, one 3000 lbs. and the other 300 lb. were shipped by Northern Metals Limited to the former Ontario Government Labs in Toronto for processing. The samples assayed 0.11-ounce Au per ton and 1.87 ounces Au per ton, respectively. One of the better results of from diamond drilling by Canper Resources Inc. in 1986 was 47.29 g/t Au over 2.5 feet (www.katrineexploration.com).

2001: Property examination and sampling by Katrine Exploration and CJP Exploration. Sample from the #1 vein assayed to 2606 ppb Au. 2002-2003:Prospecting by CJP Exploration. The best assay was 2880 ppb Au.

Assessment Work on File

Office File Number	Online Assessment File Identifier	Online Assessment File Directory
KL-4980	2.21827	Open
KL-5197	2.25752	Open
KL-5214	2.25811	Open
KL-1859		
KL-2800		

Geology Upper Blake River assemblage, with a porphyry host

Lithology Comments

03/17/2004 (G Meyer) - The property is underlain by a syenite porphyry intrusion, which occupies about 65% of the property, with the remainder underlain by andesite. Knight (1920) of the Ontario Bureau of Mines visited the property while the Nipissing Mining Company worked the property. He noted the following: The veins on which most of the work was done occur on a hill which rises some 35 feet above a shallow, weedy pond about an eighth of a mile in diameter. The rocks on the southwest face of this hill are impregnated with ankerite, or other iron bearing carbonate, which has caused them to become rusty. There are four main veins on this hill, striking about north 25 degrees west magnetic, and dipping about vertically. These veins vary in width from a few inches to 4 to 5 feet or more. One of them has been traced for 400 feet, and is probably longer. The veins consist mainly of quartz, and contain also iron pyrites, copper pyrites, specularite, galena and at times considerable ankerite or another carbonate.

Mineralisation

Au with qz-py-telluride 'gangue'. Host rock is haematised. A 2002 grab at E601421 N5340010 of QV and host rock returned 1928 ppb Au.

Several sites were visited and sampled by OGS staff and were described as follows: A quartz vein system approximately 15 m west of the shaft, at UTM NAD 83 Z17 601724E 5339809N, is exposed for 14 m along strike and over a width of 5 m. The predominant quartz vein has an azimuth of 295?, dips 86? to the north and is up to 50 cm wide. Several small quartz veins up to 4 cm wide are diagonal to the main trend of the quartz vein system. Gray syenite, which makes up the bulk of the zone with quartz veins, is altered pink (perhaps due to hematite) when in contact with the quartz veins. Two samples from the quartz veins assayed 148 ppb and 9897 ppb Au. Two selected quartz samples from the muck piles assayed 857 ppb Au and 1059 ppb. A quartz vein in a trench at the lake shore, at UTM NAD 83 Z17 601681E 5339741N, strikes at 316? and dips vertically. Narrow , shallow dipping veins were also observed. The main vein has numerous brecciated pink syenite inclusions. A sample from the main quartz vein assayed 1498 ppb Au. Approximately 400 m west northwest of the Walsh Katrine Mine, at UTM NAD 83 17 601421E 5340010N, a quartz stringer stockwork zone in altered syenite is exposed in an old trench measuring 3m x 4 m. The zone is approximately 1.5m wide, strikes at approximately 290? and is near vertical. Individual quartz veinlets are up to 1cm wide and contain 0.5 to 1% pyrite. The altered syenite host rock contains 3 to 4% pyrite and locally up to 10%. A sample from this site assayed 1928 ppb Au.

Summary:

601421E 5340010N Grab of QV and host 1928 ppb Au

601724E 5339809N Grab of QV 148.03 ppb Au

601724E 5339809N Grab of QV ran 9897 ppb Au

601778E 5339758N Grab of QV ran 856.64 ppb Au
601778E 5339743N Grab of QV ran 1059 ppb Au
6016881E 5339741N Grab of QV ran 1498 ppb Au
The mineralisation was described by ?Dave Guindon as tabular vein

References

OGS GR 29, 1964, Hogg, W.A.
OGS MDC 18, 1979, Gordon, J.B. et al.
OGS 5467, 1983
OGS OFR 6114 report of Activities, 2002, G. Meyer

16. MDI32D04NE00022 Callighan (aka Callaghan) – 1985, Mulven Lake – 1985 OFF PROPERTY

Deposit status Occurrence
Primary commodity Au
Secondary commodity Cu
Location Katrine Tp.
UTM Zone: 17 Easting: 600809 Northing: 5341540 NAD83 32D04NE
Point Location Description: Pit
Location Method: conversion from mdi
Source Map: OGS 1964, MAP 2061 ARNOLD AND KATRINE TP IN GR 29

Assessment Work on File

Office File Number KL-0314

Mineralisation Py-qz

References

OGS GR 29, 1964, Hogg, W.A.
OGS MDC 18, 1979, Gordon, J.B. et al.
Res. Geol property visit report KL#345, Pub. PV-345, 1901

The following is taken from the Rock Ore 1984 report, essentially verbatim:

“The majority of the work previously carried out on the Mulven Lake property was confined to mining claims L23551 and L23631, adjacent to the south-west part of Mulven Lake. The two claims, known as the Callighan property were staked prior to 1935 where a quartz vein, associated with a zone of shearing, strikes N72 0 E and is adjacent to, and associated with a syenite-porphyry body. A strike length of 900 feet, with widths of 2 to 6 feet was indicated by means of trenching and development pits. {S.A. Pain, 1933).

“In July 1936, Erie Canadian Mines Ltd. carried out 1056 feet of diamond drilling in five holes on claim L23551. The drill cores revealed basic lavas intruded by syenite, and quartz veins mineralised with erratic gold values. Results of surface sampling taken from a map titled Erie Canadian Mines and dated Feb. 18, 1938, were as follows: (fig. #5)

“From west to east: 160' .09 to .28 oz Au/ton over 3.0'
120' caved trench, 140' .06 to .11 oz Au/ton over 2.5', 320' .09 to .23 oz Au/ton over 3.0'

“Shortly afterwards, 19 diamond drill holes were completed by Sylvanite Gold Mines Ltd. on claim L23551. The drilling and limited surface sampling indicated that the quartz veins carry erratic gold values, but also indicated an enrichment in mineralisation with depth. Drilling over a strike length of 1,000 feet (in detail over a length of 300 feet) have the following results: (fig. #6)

DDK #2 0.42 oz. Au/ton over 2 feet
7 5.9 oz. Au/ton over 7.0 feet
9 0.27 oz. Au/ton over 2.2 feet
14 0.35 oz. Au/ton over 2.5 feet
Erie and Sylvanite sketches showing DD, trenches, assays below:

Of the remaining drill holes, numbers 5, 6, 8, 10, 11, 12, 13, 15, 16, 18, and 19 yielded values of 0.03 to 0.09 oz Au/ton. Holes 3, 4, and 17 had no significant values.

In 1971, S. Ribar conducted trenching on the southern portion of the Mulven Lake property, namely claims L579614 and L547981 in an effort to locate the syenite/volcanic contact. No geological information was recorded.

Pufidin and Company performed VLF-electromagnetic and magnetometer surveys on claims L579614, L547981, L547026, and L579990, and on April 19, 1975 reported several northerly trending conductors associated with the contact of the syenite. Investigative diamond drilling was recommended but not carried out.

During the spring and summer of 1981, thirty-six miles of linecutting and geophysics were completed to satisfy assessment requirements. An east-west baseline 3.7 miles long was cut across the northern portion of the Mulven Lake property. Traverse lines were cut at 400-foot intervals in a north-south direction. The magnetometer and VLF-electromagnetic surveys were conducted along the north-south grid lines and three east-west oriented conductors were noted.

Extensive stripping of the overburden was carried out in 1982 and 1983 by Rock Ore Exploration & Development Ltd. Stripping of the Callighan Gold Occurrence area revealed a complex pattern of syenitic rocks intruding into a thick sequence of basic lava flows. Additional stripping on claims L579631 and L579632 in the western portion of the property revealed strong shearing proximal to an intrusive contact between diorite and basic lava flows.

Refurbishing of the grid lines was completed with geological mapping (l inch to 400 feet), humus sampling and detailed VLF-electromagnetic surveys carried out over the Mulven Lake property. The results of these surveys are presented within their report.

17. MDI32D04NE00021 Natjo – 1983, Allingham, D.J. – 1983 OFF PROPERTY on east adjacent patented claims

Deposit status Discretionary Occurrence
Primary commodity Au
Secondary commodity Cu
Location Ossian Tp.
UTM Zone: 17 Easting: 609382 Northing: 5344345 UTM Datum: NAD83 32D04NE
Point Location Description: Drill hole
Location Method: based on assessment
Source Map: OGS 1974, MAP 2296 PONTIAC AND OSSIAN TPS IN GR 125

Exploration & Mining History

1946: Natjo Gold Mines Ltd. completed prospecting and ground magnetic.
1950: Natjo completed 6 diamond drill holes totalling 4285 feet.
1991: Leahy Corporation completed stripping and sampling.
1998: 1125570 Ontario Inc. completed ground magnetic and VLF-EM surveys
2009: Belanger, R. completed IP on the property.
2011: Belanger, R. completed IP on the ice to the east.

Assessment Work on File

Office File Number	Online Assessment File Identifier	Online Assessment File Directory
KL-4475	32D05SE2006	Open
KL-6483	20000006543	Open
KL-????	32D04NE0150	Open
KL-1951	32D05SE0085	Open
KL-6175	20000004155	Open
KL-2608	donation	
KL-1951	donation	

Geology Upper Blake River assemblage

Massive to volcaniclastic, rhyolite to dacite volcanic rocks in the vicinity plus minor pillowed andesitic volcanic rocks. Host is ?qz-carbonate veining.

Mineralisation

Qz-carbonate gangue

Comments

06/24/2013 (D Guindon) - Property is of interest due to the possible on-strike extension of veining at the Bordulac Mine (Russian Kid, Rocmec-1) deposit to the east in Dasserat Twp, Quebec. The Bordulac deposit ore zones consist of quartz veins with abundant pyrite to quartz quartz-rich massive pyrite zones that trend northeast to east. Savage reports assay results in MRC 3 but source of those results not found.

D Guindon **Notes:** Property visited July 5, 2012 with C. Beaudoin. Minor trenching. Sample collected to test for Na depletion etc. for possible indications of base metal potential.

?-Photo/sample 731861 2012 Ossian Natjo - intermediate fragmental UTM Zone 17 E609312 N5344257 Photo/sample 731862 2012 Ossian Natjo – intermediate fragmental UTM Zone 17 E609312 N5344257

Sample Number 12BB006A NAME Natjo TOWNSHIP Ossian NAD 83 UTM Zone 17 UTM E609312 N5344257 PROPERTY Natjo MDI Number MDI32D04NE00021

References
OGS MDC 18, 1979, Gordon, J.B. et al.
OGS OFR 5467, 1983,
Map Geological compilation of the Central Abitibi Greenstone Belt: KSZ to the Quebec border.
OGS P3565, 2005. J.A. Ayer, B.R., Berger, L.A.F. Hall, M.G., Houlé, G.W. Johns, S.D. Josey, Z.B.M.
ODM M2296 Pontiac & Ossian tps, 1974, Jensen, L.S.

18. MDI32D04NE00018 Rivard – 1995, Lowe – 1995, Raitanen – 1995 OFF PROPERTY
Deposit status Occurrence
Primary commodity Cu
Location Katrine Tp.
Latitude: 48° 14' 33.42" Longitude: --79° 42' 14.49"
UTM Zone: 17 Easting: 596219 Northing: 5344078 NAD83 32D04NE
Point Location Description: Diamond drill hole 91-1.
Location Method: conversion from mdi
Source Map: RES.GEOL.ASSESS.FILE KL#2332 DDH LOC MAP
Assessment Work on File
Office File Number
KL-1653
KL-2332
Kl-1644
Mineralisation Bornite-qz-pyrite
References
OGS GR 29, 1964, Hogg, W.A.
OGS MDC 29, 1979, Gordon J.B. et al.

QUEBEC - SIGÉOM MINERAL OCCURRENCES (Govt. Fr-Eng. Translation)

KG-72-02 Rang VIII, Canton Dasserat E612535 N5344968 32D03

1972 Gold-bearing mesothermal gold veins with quartz-carbonate gangue. The host is typically pyroxenite.

Discovered by drilling, with hole KG-72-02 intersecting vein-type mineralisation with unknown dimensions within a magnetic gabbro. In drill hole EL-01 (GM 58744), the mineralisation appears to be associated with quartz, carbonate and chlorite veins (up to 40% of veins) associated with sediments intersecting mafic lavas or altered pyroxenites. In the lava, the rock is completely impregnated by weathering but we still observe in some sectors the presence of some porphyries (feldspar and pyroxene/amphibole). In these areas, the lava is thus transformed into highly silicified, sericitized and locally haematised carbonate schists. The schist is aphanitic, fractured and locally brecciated (alteration of fractures). This unit is in contact with a massive and

homogeneous, generally magnetic pyroxenite showing altered zones (chlorite and locally carbonate) and containing in places leucoxene crystals.

Mineralisation consists of trace to 15% disseminated pyrite with traces of chalcopyrite. These sulphides are found mainly in disseminated form, or occasionally in semi-massive veinlets, in veins of quartz, chlorite, carbonates. Traces of these same sulphides are also observed in the host rocks.

Drill results: (GM 27778 and 58744): KG-72-2: 3.43 g / t Au over 0.5 m; CR-72-4: 0.15% Cu over 0.4 m (and not 0.15 oz / t or 5.14 g / t Au as mentioned in GM 27778, error in the drilling description); - Drilling (GM 58744): EL-01-06: 1.48 g / t Au over 0.7 m to 36.1 m; EL-01-12 (380 m to the west): 1016 ppb Au over 0.3 m to 91.5 m; EL-01-17: 1.4 g / t Au over 3 m at 104 m.

Alteration: In the mineralised shear zones, the lavas are strongly altered by carbonate, silica and sericite. They are also locally haematised. In pyroxenite, chloritization and carbonatization are then observed.

Typology: Mesothermal gold vein, with quartz and carbonate matrix

Comments: The mineralisation seems to be vein-type and is mainly associated with quartz-carbonate veins in shear zones.

Documents: DASSERAT NO, DP 066, DP-85-06, GM 00056-B, GM 00365, GM 00471, GM 00699-A, GM 02638, GM 05434, GM 05555, GM 08376, GM 09459-B, GM 09460, GM 09473, GM 09478, GM 09480, GM 09481, GM 09482, GM 09489-A, GM 13389, GM 27778, GM 28730, GM 31302, GM 34630, GM 37114, GM 39228, GM 44016, GM 44017, GM 44453, GM 53689, GM 53691, GM 57624, GM 57625, GM 57626, GM 58742, GM 58743, GM 58744, MB 86-14, MM 83-01, tous
Release date: 1.10.1994

El Coco Rang VIII Canton Dasserat 32D03 E613426 N5343433
Auriferous quartz-carbonate veining in a fault zone in gabbro, intersected in 2001 by DDH EL-01-01 (GM58744), approximately 240 m. east of lac Labyrinthe. Quartz-chlorite-mineralised veining within a fine grained, massive, homogeneous gabbro.

DDH EL-01-01 intersected 1.25% Cu, 4.2 g/t Ag and 197 ppb Au over 0.3 m at 26.5 m depth.
Document No's: DASSERAT NO, DP 066, DP-85-06, GM 00365, GM 00471, GM 00699-A, GM 02638, GM 05434, GM 05555, GM 09473, GM 09478, GM 09480, GM 09481, GM 09482, GM 13389, GM 27778, GM 28730, GM 31302, GM 37114, GM 39228, GM 44016, GM 44017, GM 44453, GM 46402, GM 57626, GM 58742, GM 58743, GM 58744, MB 86-14, MM 83-01, more….
Release date: 10.9.2002

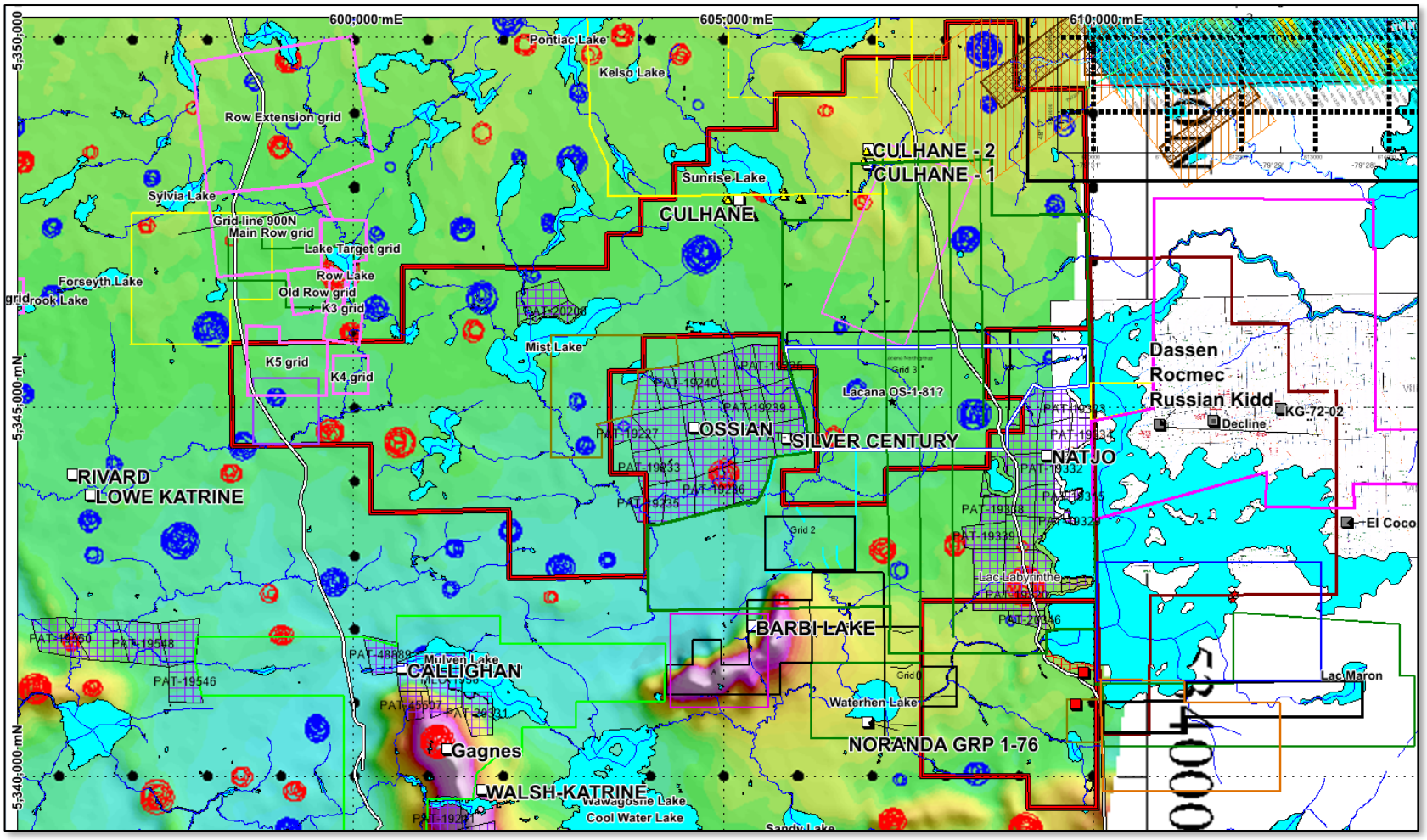


Figure 18 Larder Lake Compilation

Larder Lake Compilation showing Ontario and Quebec occurrences/showings (yellow/grey squares), with Ontario regional airborne magnetic data and Keating coefficient anomalies (red/blue circles). TGM property outlined in red-black

4.0 REGIONAL GEOLOGY

The property lies within the Abitibi-Wawa subprovince.

The Abitibi Greenstone Belt is composed of east-trending syncline-anticline geometries of Precambrian age metavolcanics and metasedimentary rocks that are believed to have formed by a complex history of arc volcanism and back arc sedimentation subsequently deformed during continental collision. The strata generally dip sub-vertically and are separated by major east-trending deformation zones (faults/breaks) that appear to control much of the gold mineralisation in the Abitibi belt.

The Abitibi subprovince

From Wyman & Kerrich, 2009

"Numerous papers have described the geologic, geochemical and geochronologic features of the Abitibi subprovince and its relationship to the rest of the Superior Province Craton (Dimroth et al., 1982; Card, 1990; Corfu, 1993; Feng and Kerrich, 1992; Calvert and Ludden, 1999; Wyman et al., 2002; Ayer et al., 2002). Ongoing studies continue to refine our understanding of the granite-greenstone terrane (e.g., Ayer et al., 2005) and help to establish the subprovince as a prime terrane for the assessment of late Archæan geodynamic models. For example, recent subprovince-wide geologic and geochronological correlations indicate the subprovince's volcanic history and tectonic evolution can be summarised in terms of a small number of volcano-sedimentary assemblages (Wyman, 2003; Ayer et al., 2002, 2005). Fig. 1 summarises the assemblages as defined in the revised stratigraphic framework of Ayer et al. (2005) and Table 1 summarises the inferred tectonic setting of the assemblages. More detailed descriptions of the assemblages and their inferred settings can be found in Ayer et al. (2002, 2005), Wyman et al. (2002), Wyman (2003) and Kerrich et al. (2007).

"Many lines of evidence establish that the subprovince is underlain by a thick CLM keel. Based on tomographic models, the sub-Abitibi lithosphere is about 280km thick (van der Lee and Frederiksen, 2005; Abbott et al., 2000). Other techniques indicate a somewhat shallower depth to the base of the lithosphere. Xenocryst data summarised by Griffin et al. (2004) imply the base of the keel near Kirkland Lake is about 170 km while recent models of Rayleigh wave dispersion gave a depth of ~190 km for the same area (Darbyshire et al., 2007).

"The geodynamic evolution of the Abitibi belt demonstrates a fact recognised in some xenolith studies: the characteristic association of deep keels and Archean cratons was not developed gradually during greenstone belt volcanism. Rather, it was initiated by the coupling of shallow imbricated plume- and arc-related crust with the buoyant residue of mantle plume melting that rose from depths of 80km to >400 km. Subduction was active along the southern and eastern margin of the Superior Province craton before and after ascent of the Abitibi plume. Renewal of

subduction in the Abitibi, as marked by the occurrence of the ~2716Ma boninitic volcanic suite, delayed the ascent of the deep keel and its coupling to the composite crust. Final ascent of the plume residue occurred following orogeny and slab loss and may have included entrainment of fragmented slab residue into the rising diapir. The coupling of shallow crust and deep keel occurred soon after and the keel's presence beneath the subprovince is recognised by Phanerozoic diamond deposits, xenolith chemistry and geophysical data."

More recently, Monecke et al., 2017 stated: "The Abitibi greenstone belt, which straddles the border between Ontario and Quebec in eastern Canada, represents one of the largest and best-preserved Neoarchean greenstone belts in the world. The belt consists of E-trending successions of folded volcanic and sedimentary rocks and intervening domes of intrusive rocks. Submarine volcanism occurred between 2795 and 2695 Ma. Six volcanic assemblages have been defined, recording submarine volcanism during specific periods of time. Komatiite successions within some of these volcanic assemblages are host to magmatic sulfide deposits. However, economically more important are volcanogenic massive sulfide (VMS) deposits, which contain a total of ~775 million tonnes (t) of polymetallic massive sulfides. Approximately half of the endowment is hosted by volcanic rocks of the 2704 to 2695 Ma Blake River assemblage. VMS deposits of this assemblage also account for most of the synvolcanic gold in the Abitibi greenstone belt, totaling over 1,100 t (~35 Moz).

"Submarine volcanism was followed by the deposition of large amounts of sedimentary material derived from a shallow marine or subaerial hinterland, created as a result of crustal thickening during an early phase of mountain building at ≤2690 to ≤2685 Ma. Submarine volcanic rocks and the overlying flysch-like sedimentary rocks of the Porcupine assemblage were affected by large-scale folding and thrusting during at least one deformational event prior to 2679 Ma. At this time, a terrestrial unconformity surface developed between the older and already deformed rocks of the Abitibi greenstone belt and molasse-like sedimentary rocks of the Timiskaming assemblage, which were deposited between ≤2679 and ≤2669 Ma. Deposition of the Timiskaming sedimentary rocks occurred in extensional basins and was locally accompanied by predominantly alkaline volcanism and related intrusive activity.

"Crustal shortening and thick-skinned deformation resulted in the structural burial of the molasse-like sedimentary rocks of the Timiskaming assemblage after 2669 Ma. Panels of Timiskaming deposits were preserved in the footwall of these thrusts, which are today represented by major fault zones cutting across the supracrustal rocks of the Abitibi greenstone belt. The structural history of these fault zones is complicated by late-stage strike-slip deformation. The Porcupine-Destor and Larder Lake-Cadillac fault zones of the southern Abitibi greenstone belt as well as second- and third-order splays off these fault zones are host to a number of major orogenic gold deposits. The gold endowment of these deposits exceeds 6,200t (~200 Moz), making the Abitibi greenstone belt one of the economically most important metamorphic terranes in the world."

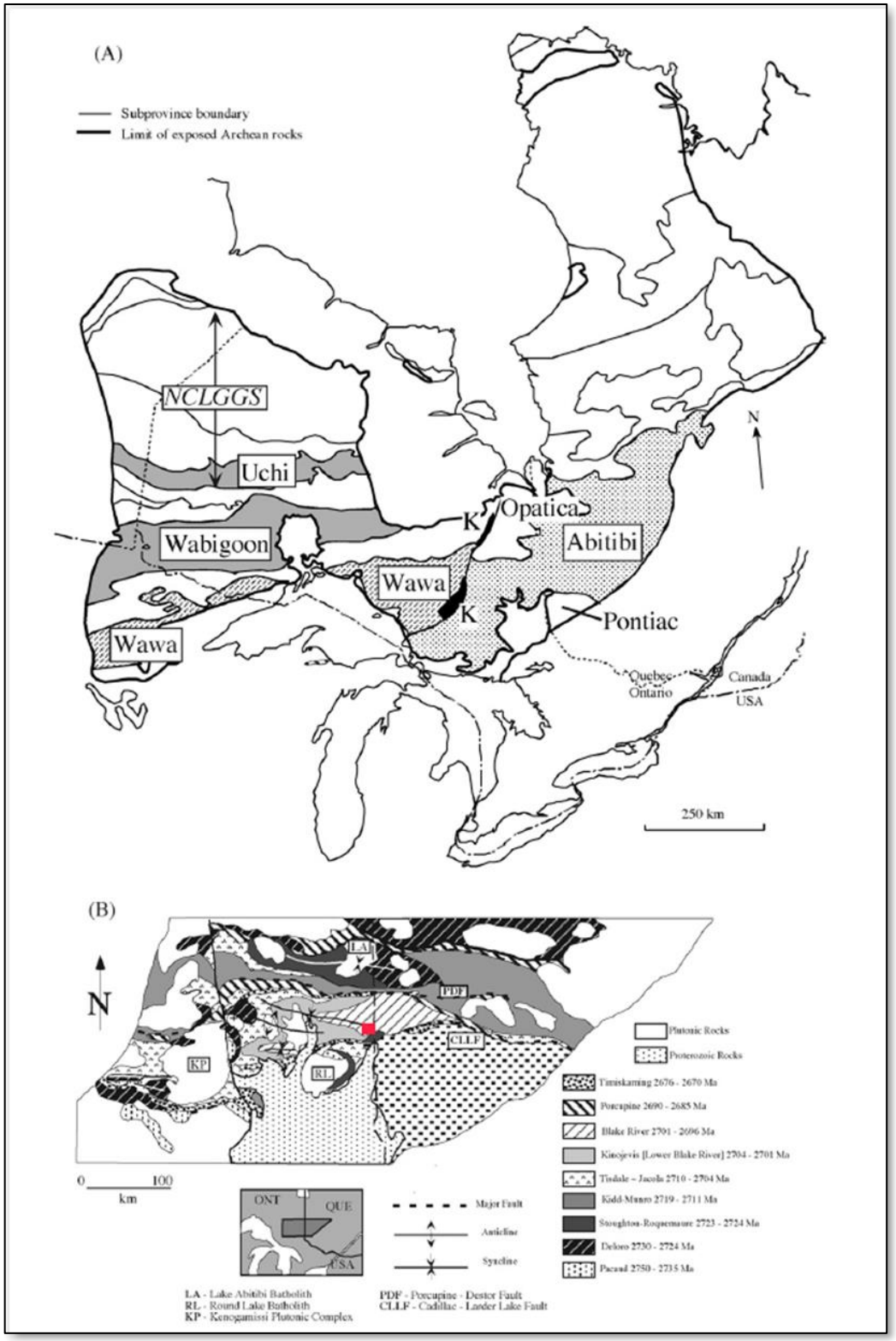


Figure 19 Regional Geology I

From Wyman & Kerrich, 2009. Red dot covers property location.

(A) Location of the Abitibi subprovince in the Superior Province craton. Wawa, Wabigoon, and Uchi subprovinces are also shown. K= Kapuskasing tectonic zone. Adapted from Thurston (1991). NCLGGS is the North Caribou – La Grande – Goudalie superterrane of Percival et al. (2004), which includes the Uchi subprovince. (B) Simplified geological map of the Abitibi subprovince, illustrating the distribution of recognised assemblages and the location of batholiths mentioned in their text. From Sproule et al. (2002) and Ayer et al. (2005). The Kidd-Munro Assemblage extends from the Kidd Volcanic Centre (KVC) in the west through the Wilkie and Walker Townships area and past Val d'Or in the east. The Krist Adakite volcanic unit occurs in the Timmins area (western Porcupine Assemblage).

The northern ('NVZ') and southern ('SVZ') volcanic zones of the Abitibi greenstone belt are separated by the Destor-Porcupine-(Manneville) fault zone aka DPFZ, which is interpreted to be the 'locus of Archæan terrane docking between the older diffuse volcanic arc of the NVZ (2730-2710 Ma) and the younger segments of the southern volcanic zone, 'SVZ' (2705-2698 Ma)." (Mueller et al., 1996)

Quebec geologists have long noted that the SVZ is composed of several generally east-west lozenge-shaped regions of volcano-sedimentary rocks that are commonly separated by sedimentary basins, e.g., Kewagama Formation (see e.g., Chown et al., 1992)

The property is located between the DPFZ and the Kirkland Lake – Larder Lake Break ('KLB'), in the southern volcanic zone, 'SVZ'. With further integration between the Ontario and Quebec 'schools of thought', the Abitibi assemblages have been re-classified into a stratigraphy shown in the following figure.

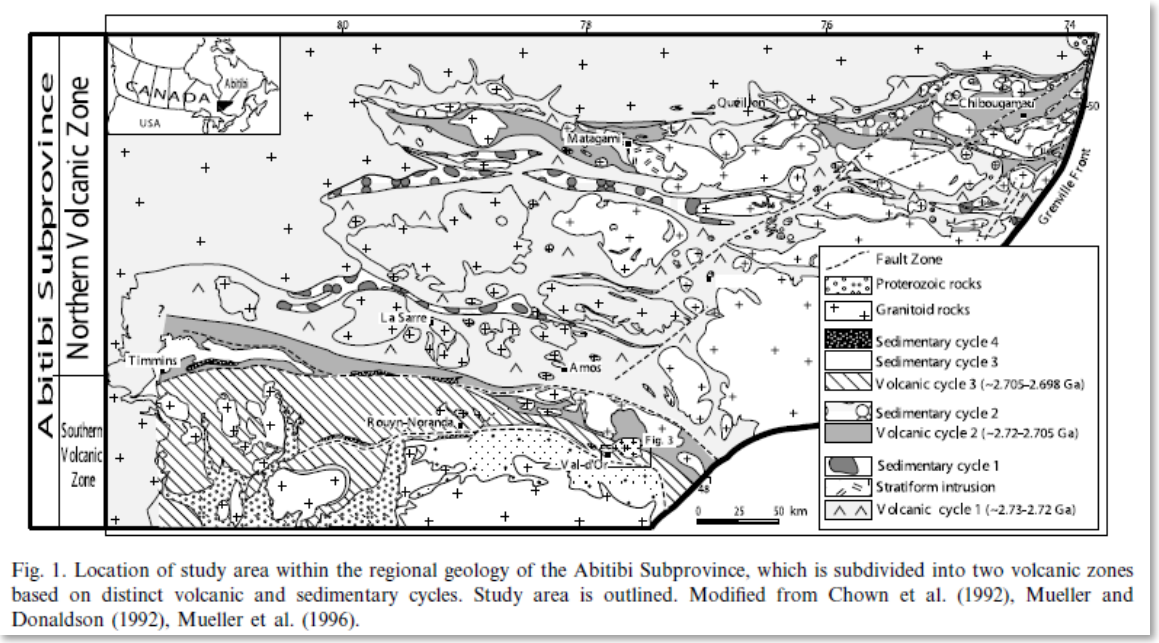


Fig. 1. Location of study area within the regional geology of the Abitibi Subprovince, which is subdivided into two volcanic zones based on distinct volcanic and sedimentary cycles. Study area is outlined. Modified from Chown et al. (1992), Mueller and Donaldson (1992), Mueller et al. (1996).

Figure 20 Regional Geology II

Above, from Scott et al., 2002. As it pertains to the region underlying the property, the dominant assemblage is the 2704-2695 Ma Blake River Group, a predominantly volcanic sequence forming part of the last of three volcano-sedimentary cycles in the Abitibi.

Structural Geology

From Abitibi Field Trip notes and presentation, U. of Ottawa Earthscience Discussion group (mrvo90).

"The structural geology of the Abitibi consists of two main E-W-striking, steeply dipping fault zones; the Destor-porcupine and the Kirkland-Cadillac fault zone and of upright to slightly overturned F1 folds with a half wavelength of 20-60 km^9 (sic).

"Several models have been suggested to interpret this setting;

"The first model deals with notions of sag-subduction and sagduction with the two faults zones being basin-binding normal faults that formed during sagduction and got reactivated during regional N-S folding[4]. The first modern-tectonic model interprets the DPFZ and KCFZ as being extensional faults binding an island arc represented by the Black River syncline and getting reactivated latter as reverse faults by the same N-S deformation event[5][6][7]. The next model proposes multiple accreted terranes[8] with the two faults zones representing terrane sutures formed during accretion of microplates. This last model is being contradicted by recent geochronological data that implies one large terrane for the whole southern Abitibi. One of the most recent models is the detachment fold model in which the two faults represent highly evolved detachment anticlines, with the ultramafic rocks being concentrated in the core of the anticlines. The faults would therefore be associated with the regional N-S folding[9].

"Five distinct generations of structures have been established:

"The first deformation event (D1) is due to the emplacement of granites at about 2700 Ma creating an unconformity between the Upper Black River and the Porcupine. D2 is a crustal uplift with N-S shortening date at about 2685 Ma that resulted in north-directed thrusts rooted in the PDDZ and folds. D3 resulted in sinistral displacement on the PDDZ, F3 folds & faults and was also responsible for the opening of a strike slip basin, the Timiskaming unconformity, in which sedimentation then occurred. D4 resulted in dextral movement along the PDDZ and folds in the Timiskaming."

Stratigraphy

The following is a summary of the stratigraphy, with sub-division within Ontario and Quebec. It is only within the last 20 years that there have been concerted, systematic efforts to merge data and produce a 'unified' stratigraphy.

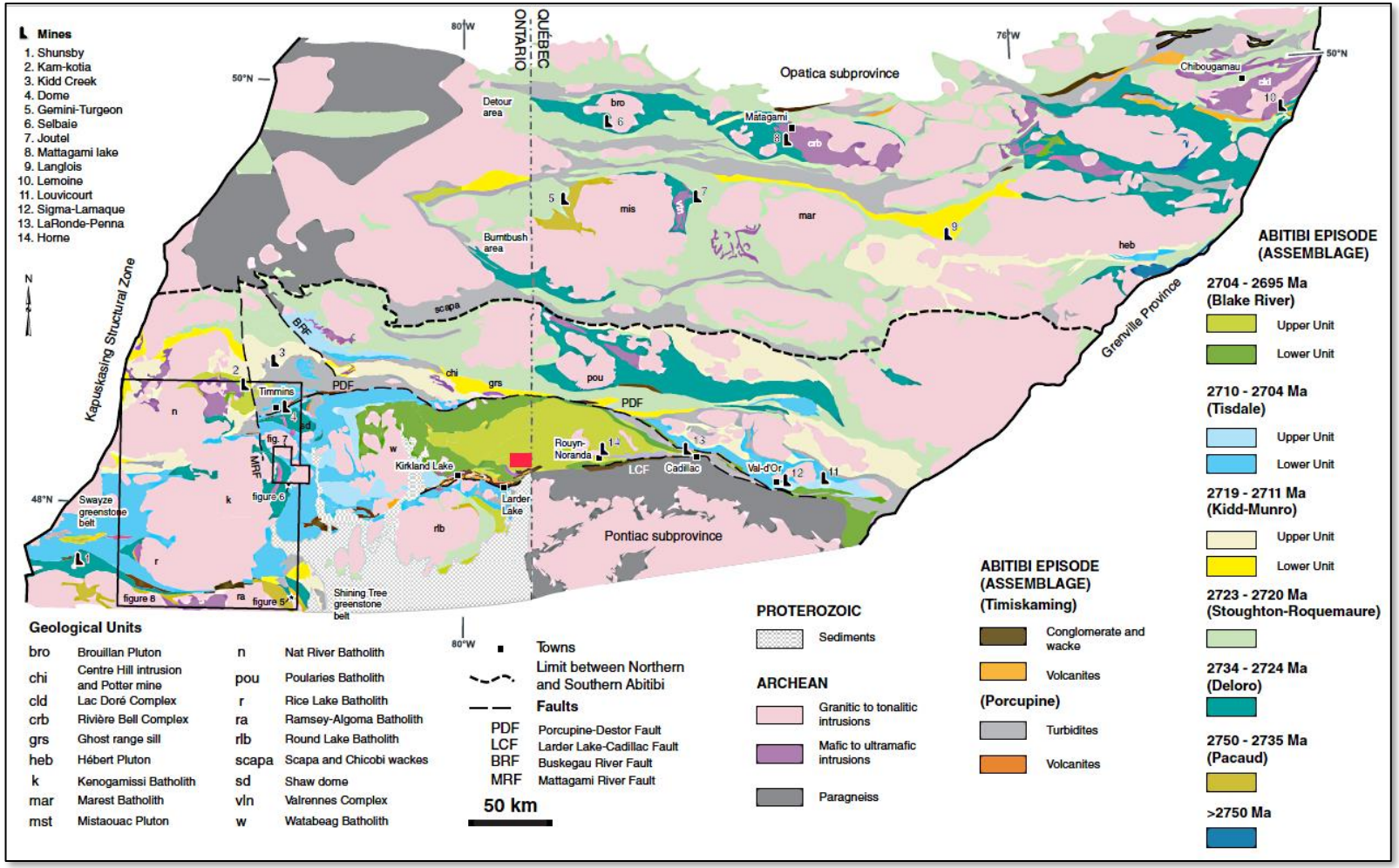


Figure 21 Stratigraphic map of the Abitibi greenstone belt

Red rectangle covers Property area. Below, the Ontario stratigraphic classification .

From Thurston et al., 2008

TABLE 1. Stratigraphy of the Southern Abitibi Geenstone Belt

Assemblage name and volcanic episode[1]	Thickness	Dominant rock types	Volcanic magma clan[2]
Timiskaming 2677–2670 Ma	Max. 2–3 km	Polymictic conglomerate and sandstone in subaerial alluvial fan, fluvial, and deltaic settings, alkaline volcanic rocks in Kirkland Lake area	Alkaline to calc-alkaline
Porcupine 2690–2685 Ma	Max. 2–3 km	Local basal felsic pyroclastic rocks of the Krist Formation (Timmins area) overlain by turbiditic sediments (argillite to wacke)	Calc-alkaline
Upper Blake River 2701–2695 Ma	1–7 km	Mafic to felsic volcanic units with volcaniclastic components	Tholeiitic to calc-alkaline
Lower Blake River 2704–2701 Ma	~10 km	Minor clastic metasediments overlain by high Mg and Fe tholeiites with minor tholeiitic andesite, dacite, and rhyolite forming upper 5%	Tholeiite similar to mid-ocean ridges
Upper Tisdale 2706–2704 Ma	~5 km	Intermediate to felsic amygdaloidal flows heterolithic debris flows, and volcaniclastic units	Calc-alkaline
Lower Tisdale 2710–2706 Ma	~5–10 km (poorly constrained)	Mafic volcanic rocks with localized ultramafic, intermediate to felsic volcanics and iron formation	Tholeiites with slight depletion of LREE, HFSE, Nb, and Ti; komatiites AUK[3]; rhyolites variably tholeiitic to calc-alkaline
Upper Kidd-Munro 2717–2711 Ma	~5 km in Munro Township	Mafic volcanic rocks with localized ultramafic and felsic volcanics and graphitic metasediments	MORB-like tholeiitic mafic and felsic volcanics with minor ADK[3] and AUK[3] komatiites
Lower Kidd-Munro 2719–2717 Ma	~5 km in Rand Township	Intermediate-felsic calc-alkaline rocks	Calc-alkaline
Stoughton-Roquemaure 2723–2720 Ma	Max. 12 km SE of Lake Abitibi batholith	Tholeiitic basalts with komatiites and local felsic volcanic rocks	MORB-like tholeiite with komatiite (ADK-AUK[3])
Deloro 2734–2724 Ma	~5 km	Mafic to felsic calc-alkaline volcanic rocks with local tholeiitic mafic volcanic units and an iron formation cap	Calc-alkaline with minor tholeiites
Pacaud 2750–2735 Ma	5 km in Shining Tree area	Ultramafic, mafic, and felsic volcanic, with minor iron formation	AEK[3] Komatiites, high Fe and high Mg tholeiites and calc-alkalic
Pre-2750 Ma 2766 ± 1.1 Ma (un-named unit, Temagami area)	~5 km	Intermediate to felsic pyroclastic rocks capped by iron formation	Calc-alkaline

Or, depending on one's leanings, below: 'Summary of supracrustal assemblages in the Abitibi subprovince, highlighting assemblages corresponding to the main phase of plume–arc interaction (2723–2707Ma)', from Wyman et al., adapted from Ayer et al. (2002, 2005).

Assemblage	Age in Ma	Dominant rock types	Volcanic chemical affinity	Tectonic setting-volcanic affinities
Timiskaming	2676–2670	Mafic to intermediate volcanic	Alkalic to calc-alkalic	Continental arc-orogeny
Porcupine	2690–2685	Turbidite, minor conglomerate and iron formation	Calc-alkalic	Pre-orogenic to orogenic
Upper Blake River	2701–2696	Mafic to felsic volcanic	Tholeiitic to calc-alkalic	Rifted island arc to constructive arc
Lower Blake River (Kinojevis)	2704–2701	Mafic and minor felsic volcanic	Tholeiitic	Rifted arc
Upper Tisdale	2706–2704	Intermediate to felsic volcanic	Calc-alkalic	Island arc
Lower Tisdale	2710–2707	Ultramafic, mafic, felsic volcanic and iron formation	Komatiitic, tholeiitic and calc-alkalic	Plume and island arc
Upper Kidd-Munro	2717–2711	Ultramafic, mafic, felsic volcanic and iron formation	Komatiitic, tholeiitic, boninitic, and calc-alkalic	Plume and island arc
Lower Kidd-Munro	2719–2717	Intermediate to felsic volcanic	Calc-alkalic	Island arc
Stoughton-Roquemaure	2723–2720	Ultramafic, mafic, intermediate and felsic volcanic	Komatiitic, tholeiitic and calc-alkalic	Plume and island arc
Deloro	2730–2724	Mafic, intermediate and felsic volcanic and iron formation	Tholeiitic and calc-alkalic	Island arc
Pacaud	2750–2735	Ultramafic, mafic and felsic volcanic	Komatiitic, tholeiitic and calc-alkalic	Island arc; minor plume

A geological history for the eastern Ontario Abitibi is from the U. of Ottawa EarthScicence Gp: Based on the interpreted volcanogenesis and the spatial position of each assemblage, Ayer (2002) proposed a Plume-Tectonic interaction model divided as follows:

Stage 1 (2745-2725): Volcanic construction phase 1. Deposition of Pacaud and Deloro. Deep water, plume or back arc.

Stage 2: (2725-2708): Volcanic Construction phase 2. Deposition of Kidd-Munro + Stoughton-Roquemaure outside the faults. Inverse movement on the faults.

Stage 3: (2708-2698): Volcanic Construction phase 3. Deposition of Tisdale, Kinojevis and Black River between the faults. Normal movement on the faults.

Stage 4 (2696-2685): Compression. Deposition of Porcupine near the fault zone.

Stage 5 (2685-2670): Extension. Deposition of Timiskaming in fault-bound extensional basins.

Stage 6 (2670- 2640): Final Cratonization: Last regional folding, emplacement of granitic plutons & regional metamorphism.

Blake River Assemblage

The Property and surrounding area are underlain by the Blake River Assemblage, a tholeiitic to calc-alkalic volcanic assemblage extending east of Val d'Or and west of Timmins, and host to a considerable percentage of the Abitibi gold and VMS deposits.

The Lower Assemblage has an age range of 2704 to 2701 Ma, and was previously identified in Ontario as the Kinojevis assemblage by Ayer, Amelin et al, 2002: however, in Québec, the Kinojevis is dated at 2718± Ma, which correlates with the Kidd-Munro assemblage in Ontario. The sequence consists predominantly of tholeiitic mafic volcanic rocks with minor tholeiitic felsic volcanic rocks and turbiditic sedimentary rocks.

The Upper Assemblage ranges from 2701 to 2696 Ma, and is composed predominantly of flows of calc-alkaline basalt to andesite, and localised bimodal tholeiitic basalt and rhyolite . It is more voluminous than the Lower Assemblage and contains several caldera/cauldron features, stocks and related intrusions.

Intrusions have been divided into three groups: synvolcanic, syn-tectonic and post-tectonic.

Intermediate to felsic syn-volcanic intrusions are generally coeval with volcanic assemblages including Blake River, and are generally calc-alkaline, and having formed over a 90my period, from ca. 2745 to 2696 Ma. They are typically foliated, tonalitic to granodioritic, occurring as batholiths, sheets or laccoliths.

Mafic to ultramafic syn-volcanic intrusions range in age from ca. 2740 to 2700 Ma, occur as sills or lenticular units and cut stratigraphy at a low angle. Compositionally, they can be peridotitic to gabbroic to dioritic.

Syn-tectonic intrusions are often coeval with major deformational episodes in the Abitibi, ranging in age from 2695 to 2670 Ma. "These may be related to compressional events resulting in early ?F1 folding and faulting and the onset of collision between the Abitibi and older subprovinces in the north. Apparently, these intrusions are within the 'external batholiths', and as smaller batholiths stocks and dykes internal to the supracrustal belt such as the lake Abitibi and Watabeag batholiths, the Adams and Clifford stocks and smaller porphyries and dykes." (Ayer et al., 2005) Further, they note "Regional deformation episodes have been identified based on overprinting relationships of folds and faults with D_1 constrained by cessation of Blake River assemblage volcanism at 2696 Ma and onset of the Porcupine assemblage at 2690 Ma. D_1 folds are commonly re-folded and transposed by later deformation and, therefore, it is often difficult to determine the original orientation of D_1 structures." Where they have been identified, they have a northerly orientation.

Late tectonic intrusions range in age from ca. 2670 to 2600 Ma and intrude much of the entire Abitibi belt. They are typically batholithic in nature, and granitic.

Some consider larger batholithic complexes to represent structural domes and the intervening areas defining belt-scale synclinoria, e.g., the Blake River synclinorium, in this instance referencing work dating back to the likes of Jensen. In the noughties, Benn and Peschler (2005) proposed a single, belt-wide detachment model for the development of this synclinorium that deformed the whole region. Other contemporaneous and later work proposed a more protracted event occurring in a number of distinct intervals 'based on geochronological, stratigraphic, potential field geophysical data and high-resolution reflection seismic surveys." (See Ayer et al., 2005).

From Montgomery, 1996:

"The Blake River Group calc-alkalic volcanics range from basalts to rhyolites, with basalts and andesites being dominant. Dacite and rhyolite are abundant in the centre of the group. Units of the Blake River Group are shallow to moderately dipping. Along the margins of the group, units face towards the centre of the group suggesting a synclinorium. The centre of the group is occupied by an anticlinal structure cored by felsic intrusions. This may represent an original volcanic centre. The Blake River Group has a flat aeromagnetic signature and a sharp contact with the convoluted aeromagnetic pattern of the Kinojevis South Group, to the south.

"The property covers the central portion of a felsic volcanic sequence (anticline) that stretches from Mist Lake to the east side of Labyrinth Lake. In this felsic sequence gold occurs in quartz zones and pyritic rhyolite tuffs on the Ossian Gold Mine Property adjoining the Boudreault-Labbé Property to the west. No gold production has been recorded from the Ossian Gold Mine Property. East of the property in Quebec, approximately 2,125 oz of gold was produced from the

Russian Kid Gold Mine from 1981 to 1982. This former producer is located one kilometre southeast of the Boudreault-Labbé Property. The gold mineralisation at the former Russian is found in quartz zones and their pyritic wallrock contacts within a quartz diorite intrusion."

Mining at Russian Kid continued until 2019, and it is now under receivership. Most recent exploration indicated a reasonable gold potential in fractures and 'shears' within the country rock rather than the diorite-(gabbro).

The Blake River Group has been extensively and comprehensively studied in Quebec, resulting in a better merging with and several changes made to Ontario stratigraphy. As part of a revision of the southern Abitibi, PQ and ON stratigraphy was re-classified based on isotopic work. Three major researchers were J. Goutier (MNRF), J. Ayer, (OGS) and P. Thurston, (Laurentian U.)

The last joint published map of the Abitibi Subprovince (Ontario-Quebec, 1: 500,000) dates back to 1984. The authors presented a stratigraphy supported by isotopic dating. Their stratigraphy includes nine volcanic episodes:

1) pre 2750 Ma (Fecteau Formation, 2791 Ma)

2) 2750-2735 Ma (Pacaud group and the Gemini-Turgeon unit)

3) 2734-2724 Ma (groups of Deloro, Hunter, Watson Lake and Waconichi Formation)

4) 2723-2720 Ma (Stoughton-Roquemaure and Collines de Cartwright)

5) 2719-2710 Ma (Kidd-Munro groups, Kinojévis and Malartic)

6) 2709-2704 Ma (Tisdale Group and Formation de Val-d'Or)

7) 2704-2695 Ma (Formation d'Hebecourt and Blake River Group)

8) 2690-2687 Ma, porphyritic calc-alkaline volcanism (Krist Formation)

9) 2690-2672 Ma, alkaline volcanism (Timiskaming Group and Haüy Formation)

"Within the Blake River Group, seven major formations have been recognized and are, from the oldest to youngest: Hebecourt, Horne, Rouyn-Pelletier, Duprat-Montbray, Noranda, Bousquet and Reneault- Dufresnoy. Much of the information comes from the 1987-2007 IGC-3 Copper Project, which defined the Blake River units after extensive mapping in Quebec.

"The Hebecourt Formation and the lower part du Rouyn-Pelletier are interpreted as the tholeiitic basis on which the other units have developed. The Horne sequence, containing the massive sulphide deposit of the same name, is characterized by a stack of volcaniclastic felsic and proximal facies of vents whose dating indicates that this is the oldest felsic unit of the Blake River. The upper part of Rouyn-Pelletier and the Duprat-Montbray Formation form assemblages bimodal volcanics. The Duprat-Montbray Formation extends into Ontario to include rhyolite from

the township of Pontiac. The Formation of Noranda, younger than the Duprat-Montbray, is divided into three sequences: 1) the bimodal mine sequence, with the numerous VMS deposits; 2) the Héré sequence resting on the mine sequence, and which contains the Delbridge and D'Eldona gold VMS deposits; 3) the younger Cyprus sequence, with a strong tholeiitic signature.

“The Reneault-Dufresnoy Formation forms the northern edge of the Blake River in Québec and would extend over much of Ontario's Blake River, including the volcanic rocks of Ben Nevis. It lies stratigraphically both on the Hebecourt and on the Duprat-Montbray and is characterized by units rich in phenocrystic plagioclase, a wide variety of volcanic facies, several volcaniclastic facies and vesicular layers.

“This marks a major change in the volcanism of the Blake River and there is probably a hiatus at the base of this formation. Although partly contemporaneous with the Reneault-Dufresnoy Formation, the Bousquet Formation is distinguished by its volcanic facies and the concentration of gold-bearing VMS deposits (Bousquet and LaRonde-Penna).

“The structure of the Blake River can be represented by the image simplified of a crushed N-S sombrero where the old units crop out on the outside and in the centre. The youngest units are therefore found in the crown. The new potential zones of VMS mineralisation are: the summit of the Noranda Formation which would present a Matagami-style with tholeiitic spherulitic rhyolites (Cyprus); the base of the Reneault-Dufresnoy; sectors to the west of intermediate volcaniclastics adjacent to rhyolites in the Reneault-Dufresnoy Formation (Fabie-Magusi Bay style).

“There are five episodes of mineralisation, the oldest to the youngest as follows: 1) Horne; 2) Aldermac; 3) sequence of mines (Amulet, etc.); 4) Delbridge-D'Eldona; 5) Bousquet-LaRonde, Bouchard-Hébert, Fabie-Magusi bay. Later work would define the geological setting and age of the Quemont and Gallen deposits as well as new mineralisation from the Cyprus rhyolite.”

Dione and Rhéaume, 2007 studied the PQ portion of the Blake River Group, specifically, to ‘refine the stratigraphy and characterize the volcanic processes in the Duprat-Montbray Formation.’ This formation is considered to underlie the TGM property but detailed stratigraphic studies have not been carried out over the area, and classification is by extension. Much of their work was on the Flavrian-Ouest volcanic complex to the east, around Noranda, with the PQ overall stratigraphy and plutonic complexes displayed below.

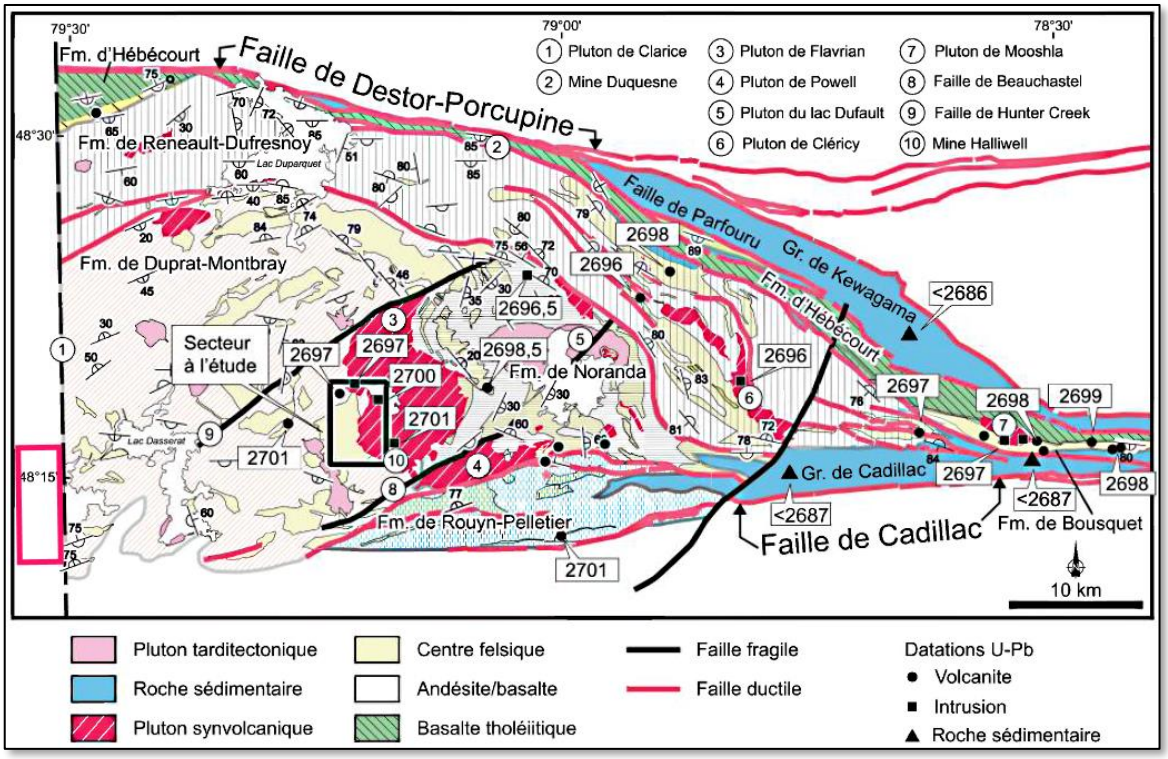


Figure 22 Simplified geology Quebec Blake River Group

Above, simplified geological map of the Québec Blake River Group, showing the location of geochronological sampling. Gabbro-diorite intrusions are omitted for clarity. Figure from Dion & Rheaume, 2007, modified from Goutier et al., 2007. The eastern area of the TGM property is shown outlined in red, with the underlying geology forming part of the Formation de Duprat-Montbray.

In the 2000's significant advances were made in understanding the geology and history of the Blake River assemblage and its megacaldera complex in the Noranda region (see notably, Pearson, V., & Daigneault, R., 2009, and Mueller et al., 2007). Their very comprehensive studies re-defined the stratigraphy and established the importance of the development of the megacaldera especially in relation to the formation of the VMS deposits.

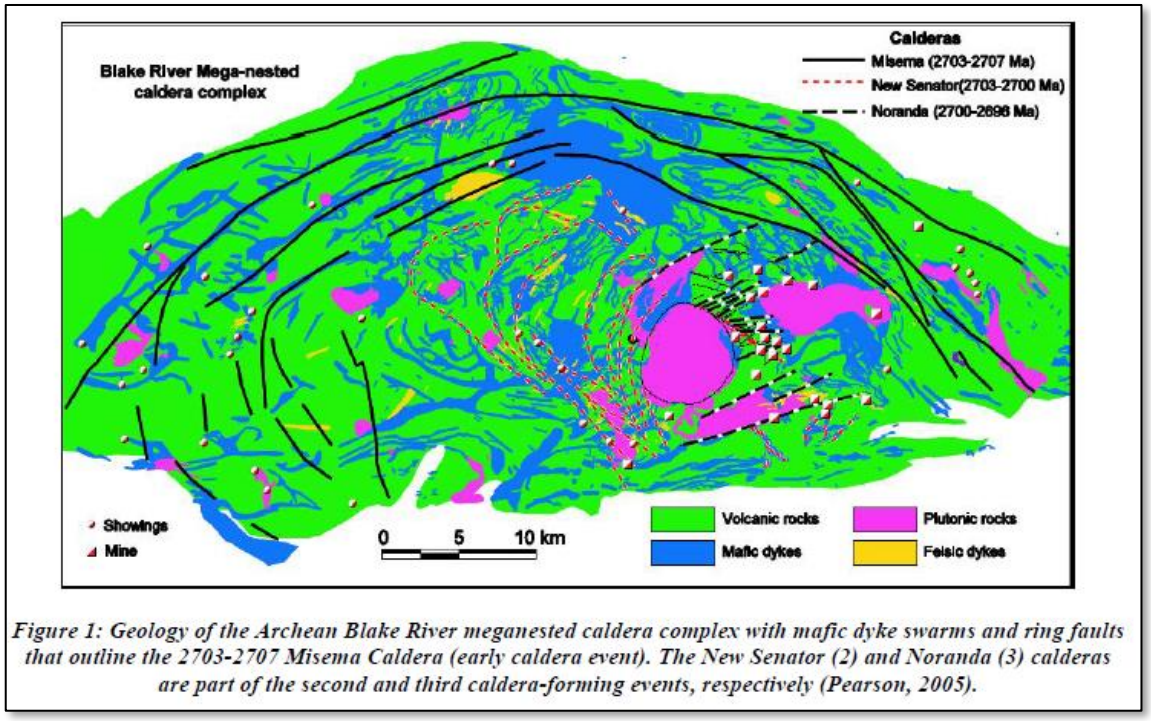


Figure 1: Geology of the Archean Blake River meganested caldera complex with mafic dyke swarms and ring faults that outline the 2703-2707 Misema Caldera (early caldera event). The New Senator (2) and Noranda (3) calderas are part of the second and third caldera-forming events, respectively (Pearson, 2005).

Figure 23 Geology of the Blake River megacaldera complex

Above, from Pearson, 2005, defining the two main reginal calderas Misema and New Senator, leading to the megacaldera complex proposal and identification of radial and 'concentric' dyke swarms.

The following five images are from Pearson & Daigneault, 2009. Items of note are the distribution and geometry of radial and especially ring-dyke complexes within the megacaldera, stress trajectories (potential fluid pathways), and the resulting deformation and morphology of the Blake River Group. The red rectangle covers the TGM LL property.

Property area approximately covered by red square, and not tied to geology. Red dashed line – ON-PQ border

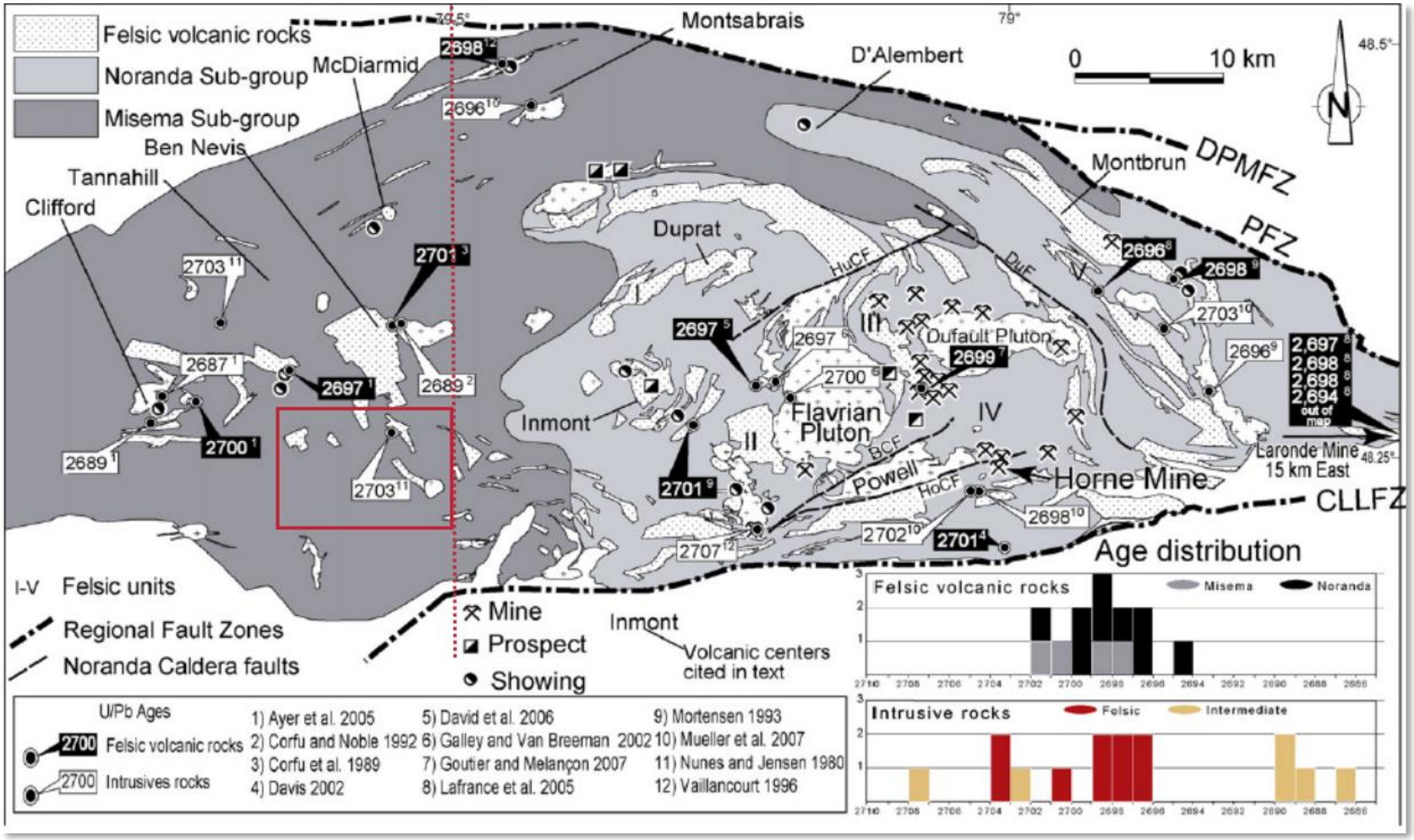


Fig. 2. Map showing the relevant features of the Blake River Group and the distribution of the two subgroups (Misema and Noranda) and felsic volcanism. Roman numbers refer to felsic units of the Noranda Subgroup (Gibson and Watkinson, 1990). The Hunter Creek Fault (HuCF), Horne Creek Fault (HoCF) and Dufresnoy Fault (DuF) are boundary faults around the Noranda Caldera (de Rosen-Spence, 1976; Gibson and Watkinson, 1990). DPMFZ= Destor-Porcupine-Manneville Fault Zone, CLLFZ = Cadillac-Larder Lake Fault Zone, PFZ = Parfouru Fault Zone, BCF = Beauchastel Creek Fault.

Figure 24 Regional geological features of the Blake River Group

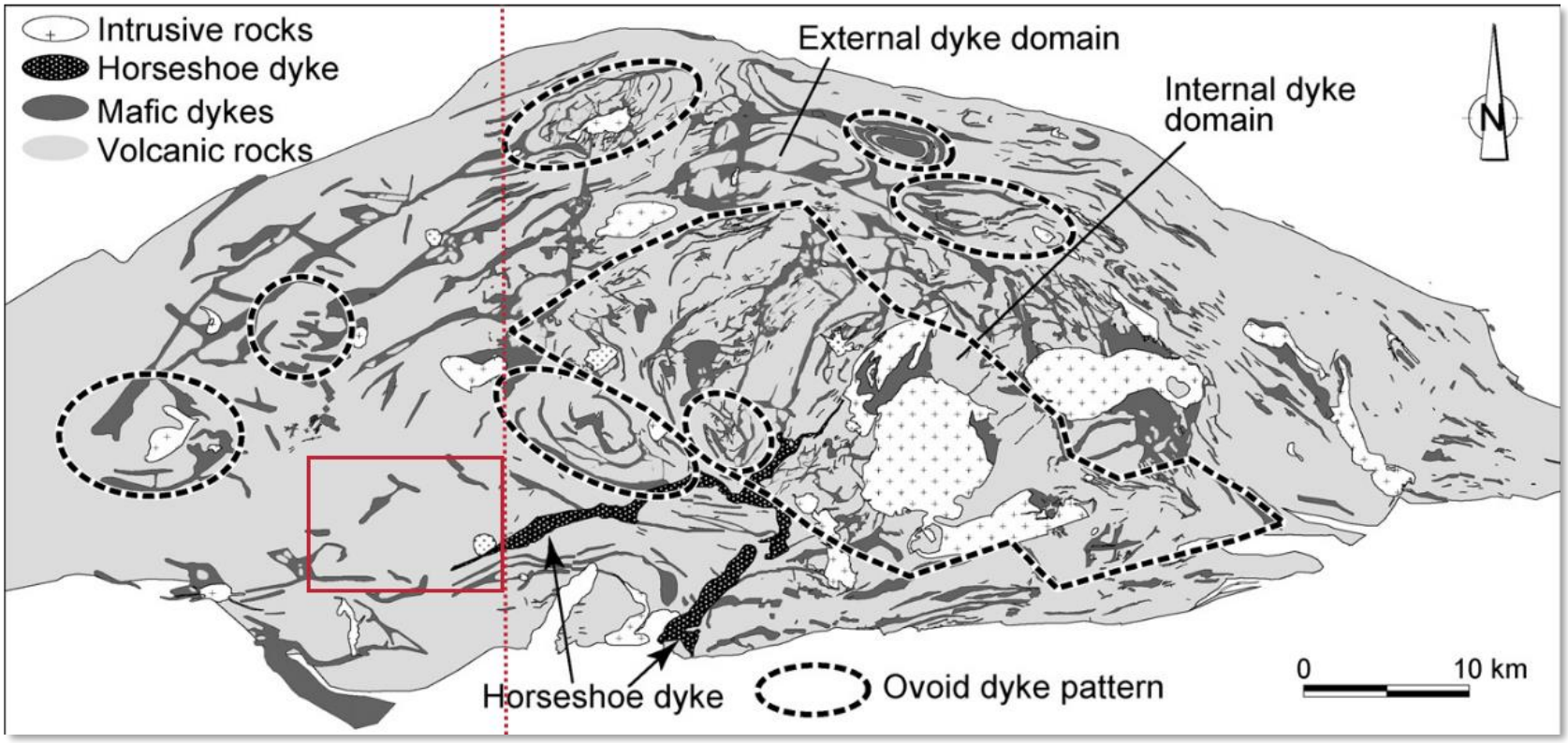


Fig. 3. Distribution of the mafic dyke swarms in the Blake River Group. Dashed lines highlight the main features discussed in the text. The external domain display ring and radial dykes punctuated by local ovoid dyke swarms. The internal domain is mostly characterized by crescent-shaped dykes around the Flavrian Pluton. The Horseshoe dyke is indicated in reference to the text.

Figure 25 Mafic dyke swarms, Blake River Group

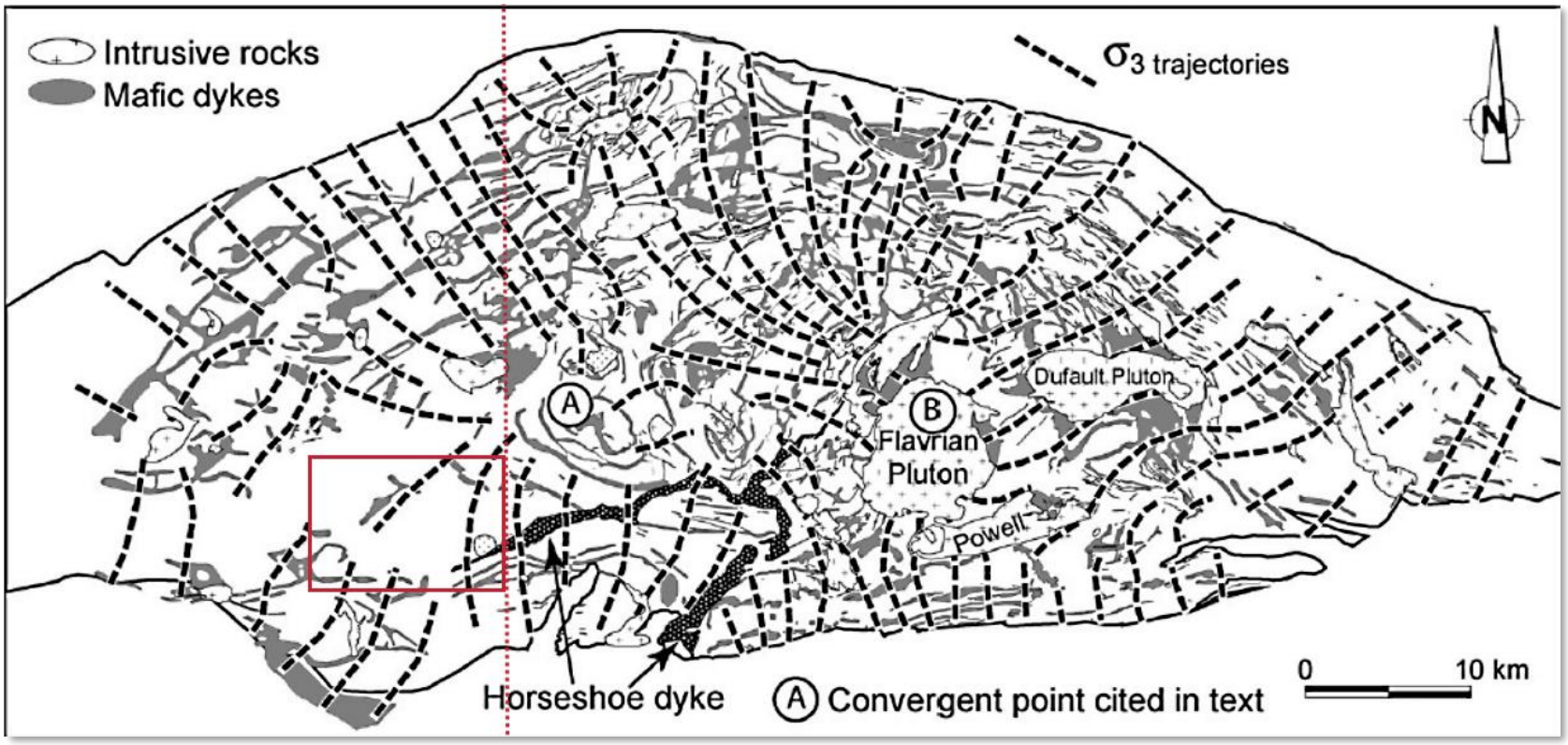


Fig. 5. Minimum stress trajectories deduced from dyke patterns in the Blake River Group. Note that the points of convergence correspond to the locations of the ovoid dyke swarms and to the Flavrian pluton. (A) and (B) convergent points are areas where strata dip gently (20–40◦).

Figure 26 Minimum stress trajectories, Blake River Group

Sigma 3 trajectories could correspond to several radial fracture sets from intrusive/volcanic epicentres. A north-east trending Sigma 3 on the LLP may correspond to a low order fault off the Cadillac-Larder Lake Break.

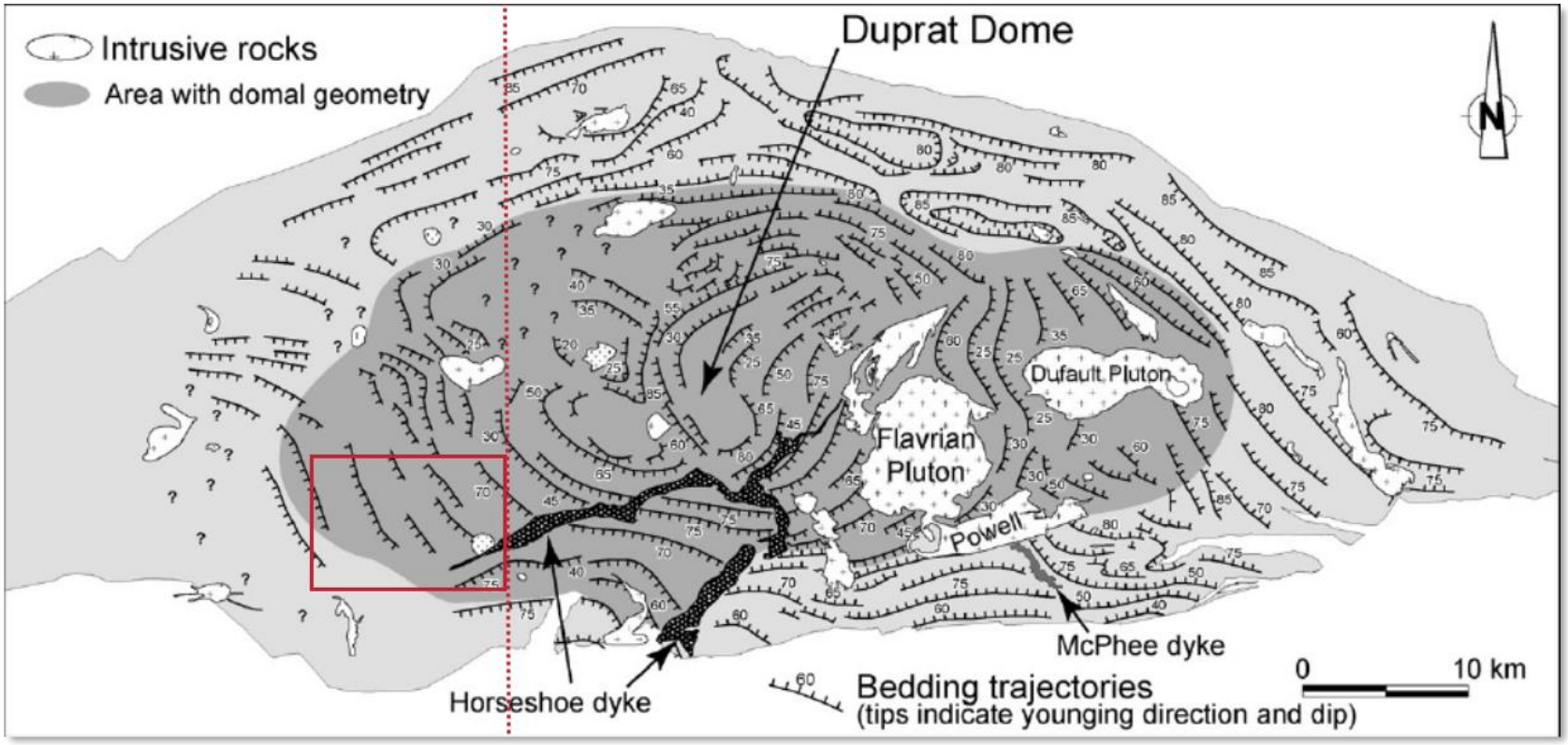


Fig. 6. Trajectories of bedding attitudes in the Blake River Group. The general architecture depicts an inner dome (Duprat) with gently to moderately outward-dipping strata. At the periphery, strata dip steeply, are typically inward-facing, and are locally affected by folding. Discontinuities in bedding trajectories are along synvolcanic faults and dykes, and along late faults.

Figure 27 Bedding attitude trajectories, Blake River Group

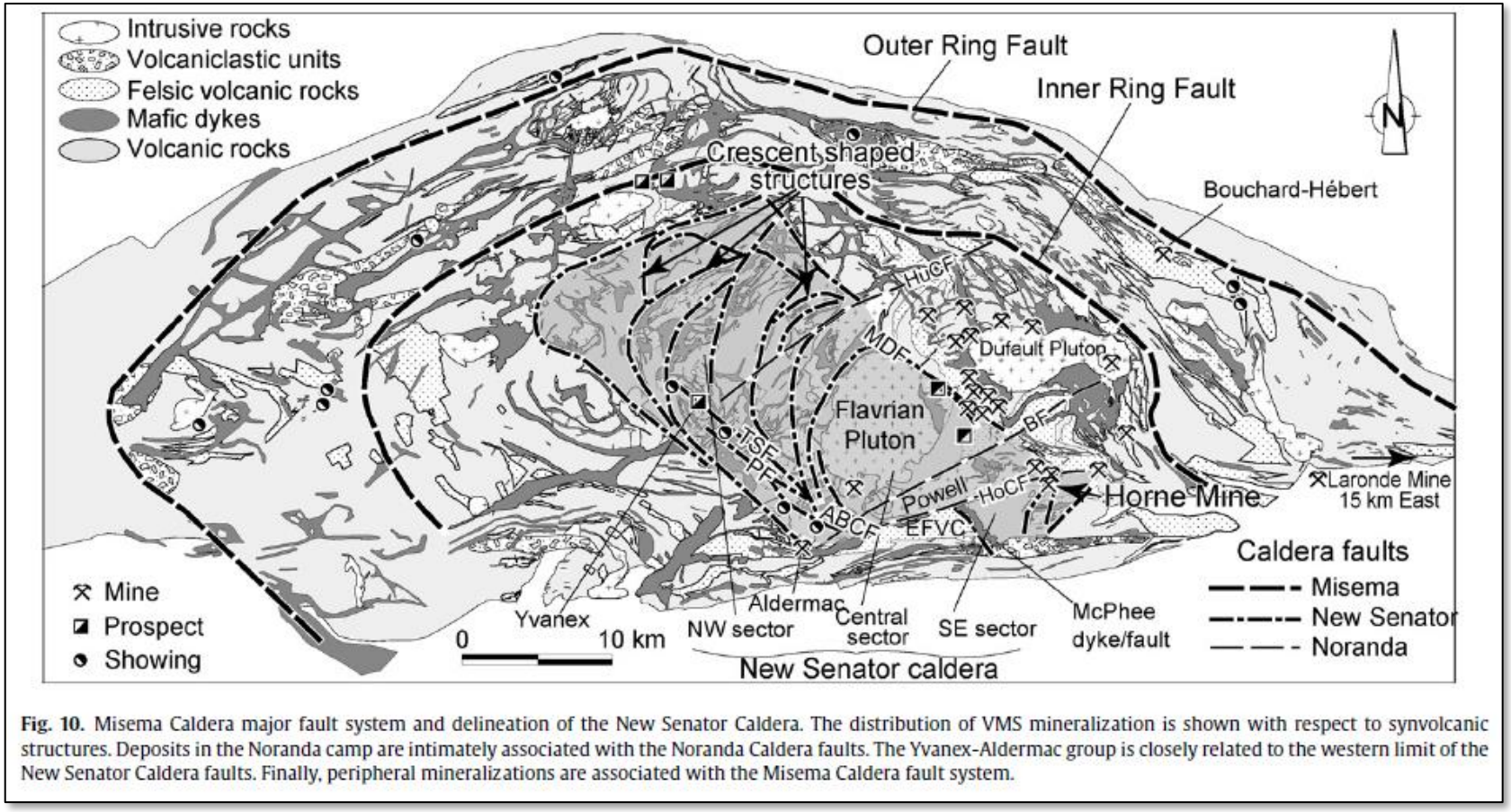


Fig. 10. Misema Caldera major fault system and delineation of the New Senator Caldera. The distribution of VMS mineralization is shown with respect to synvolcanic structures. Deposits in the Noranda camp are intimately associated with the Noranda Caldera faults. The Yvanex-Aldermac group is closely related to the western limit of the New Senator Caldera faults. Finally, peripheral mineralizations are associated with the Misema Caldera fault system.

Figure 28 Misema and New Senator calderas

The larger Misema caldera has two well-defined fault systems, an Inner and an Outer ring fault that demarcate its boundaries .

Lennox et al., 2016 (see fig. below), elaborated, refined and summarised the most recent studies with a regional geology shown below. Red rectangle covers TGM property area and ground west into Ben Nevis Tp. Note, any substantial felsic volcanic centres have yet to be defined on the property, though small exposures have been identified during various exploration programmes.

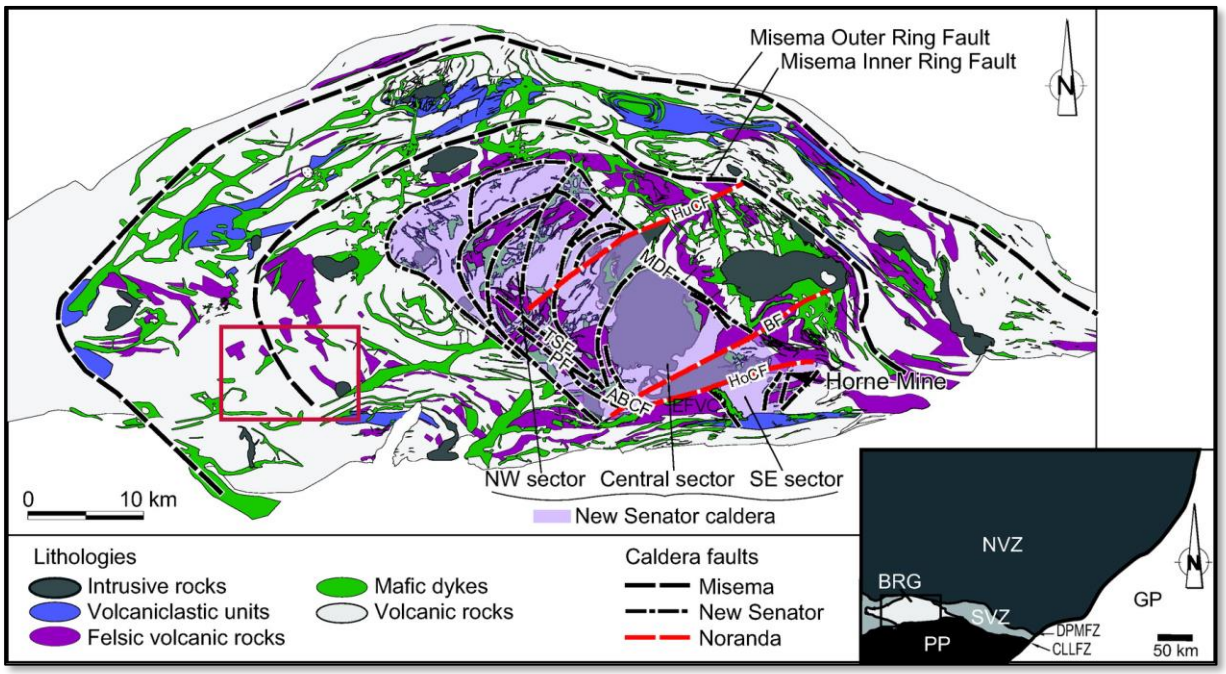


Figure 29 Regional geology, Misema and New Senator complexes

Ontario volcanic complexes within the Misema Caldera are the Ben Nevis and Clarice, respectively west north-west and north of the property. Both have been the subject of lengthy but relatively unsuccessful VMS and Au exploration. The southern portion of the Clarice Lake volcanic complex extends onto the TGM North block ground, though its precise extent has yet to be determined. Overleaf, from Piercey et al, 2008., showing distribution of Blake River Group volcanic complexes

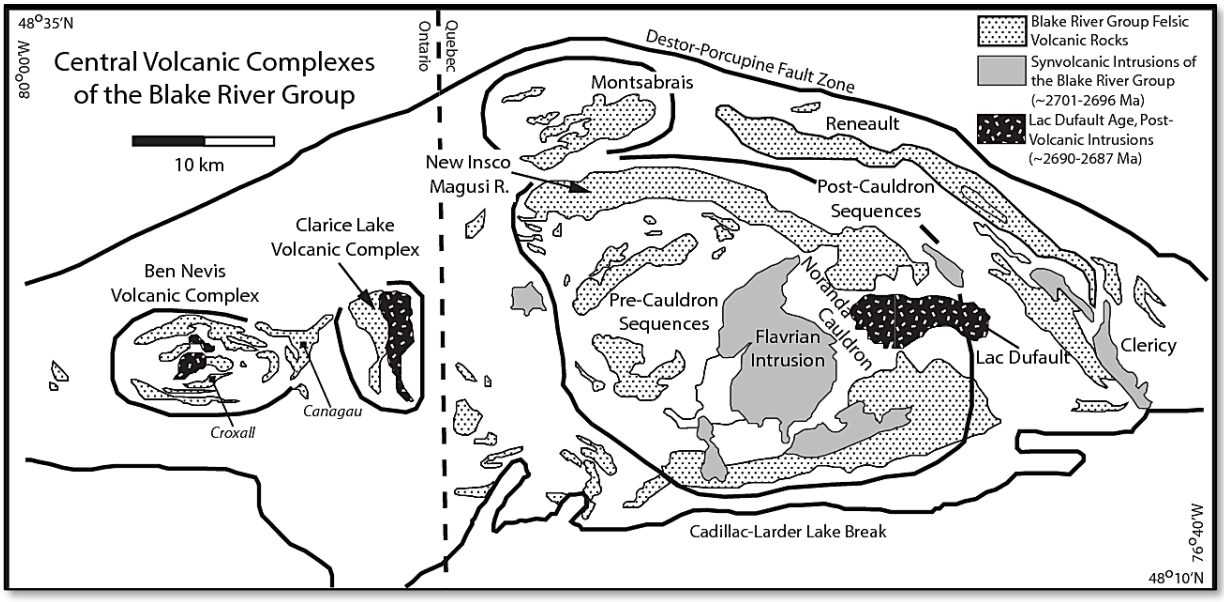


Figure 30 Blake River Group volcanic complexes

See Hannington et al., 2002 for information on regional-scale alteration and VMS within the Blake River Group. Their work, covering hydrothermal alteration (Fe:Mg), oxygen isotope, metamorphic conditions and assemblages and carbonate alteration, concluded the Ben Nevis Complex probably does not contain a "large enough fossil geothermal system of sufficient size or intensity to have produced a large massive sulphide deposit." The Clarice Lake complex has received less coverage and its overall prospectivity is unknown. Several companies explored it with negative results. Only a small portion of the historical work is reported in this author's document.

Pearson and Daigneault, (2009) indicated that despite the common association of carbonatization and orogenic gold deposits, the carbonate distribution in the Blake River Group "follows a pattern constrained by the Outer and Inner Ring Faults. This distinct pattern is not associated with late shear zones but rather with synvolcanic faults." They interpreted the alteration as a Misema (caldera)-related hydrothermal event."

Below, regional carbonate intensity followed by their interpretation of fault lines and systems within the BRG. TGM carbonate alteration could be of similar intensity to that at Ben Nevis and perhaps Clarice Lake, though clearly, there are very few sample points on the property, and to re-iterate, there are no known large felsic volcanic centres on the property. Historically, these are associated with VMS, especially in Quebec.

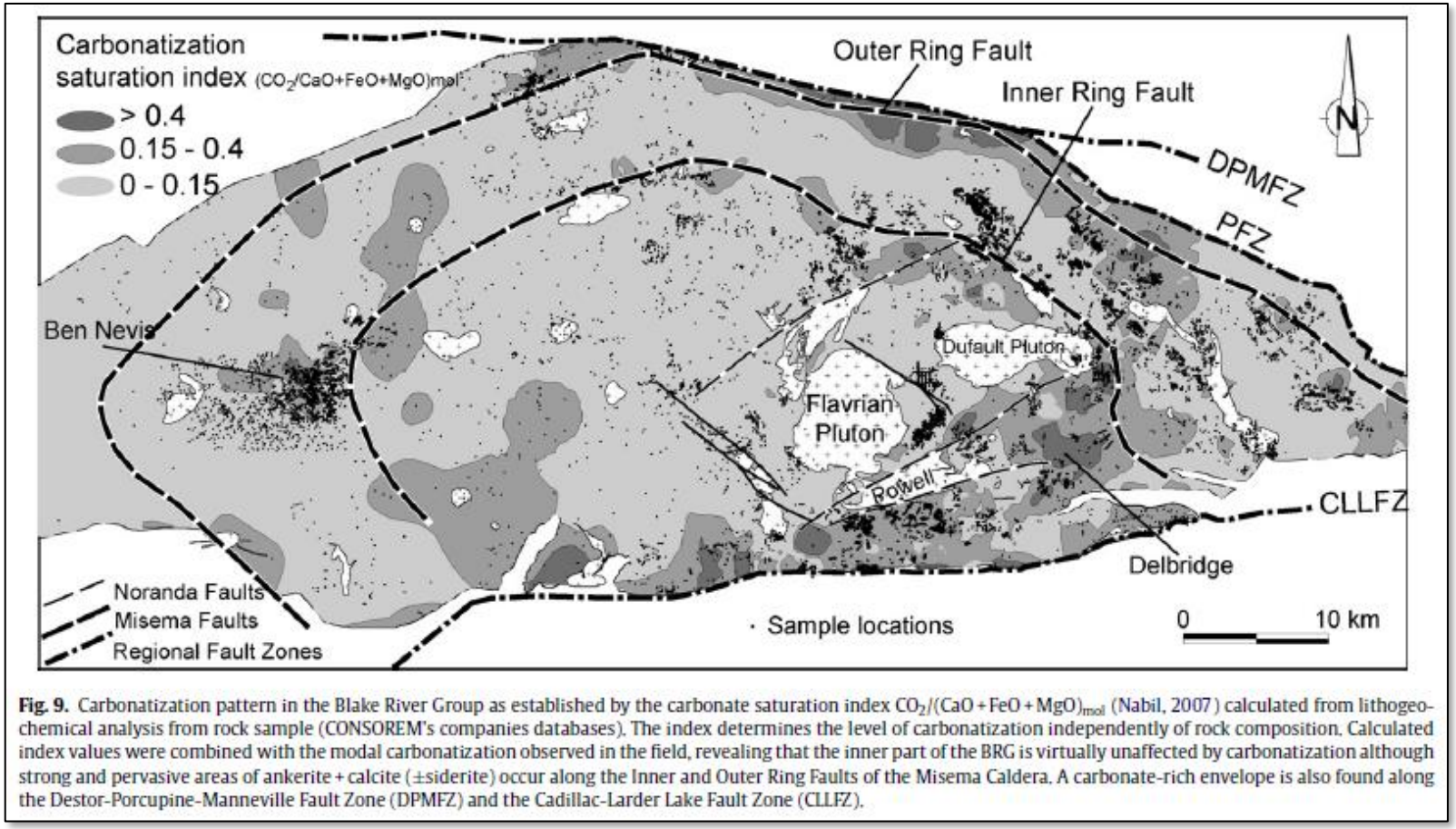


Fig. 9. Carbonatization pattern in the Blake River Group as established by the carbonate saturation index $CO_2/(CaO+FeO+MgO)_{mol}$ (Nabil, 2007) calculated from lithogeochemical analysis from rock sample (CONSOREM's companies databases). The index determines the level of carbonatization independently of rock composition. Calculated index values were combined with the modal carbonatization observed in the field, revealing that the inner part of the BRG is virtually unaffected by carbonatization although strong and pervasive areas of ankerite + calcite (±siderite) occur along the Inner and Outer Ring Faults of the Misema Caldera. A carbonate-rich envelope is also found along the Destor-Porcupine-Manneville Fault Zone (DPMFZ) and the Cadillac-Larder Lake Fault Zone (CLLFZ).

Figure 31 Carbonatization in Blake River Group

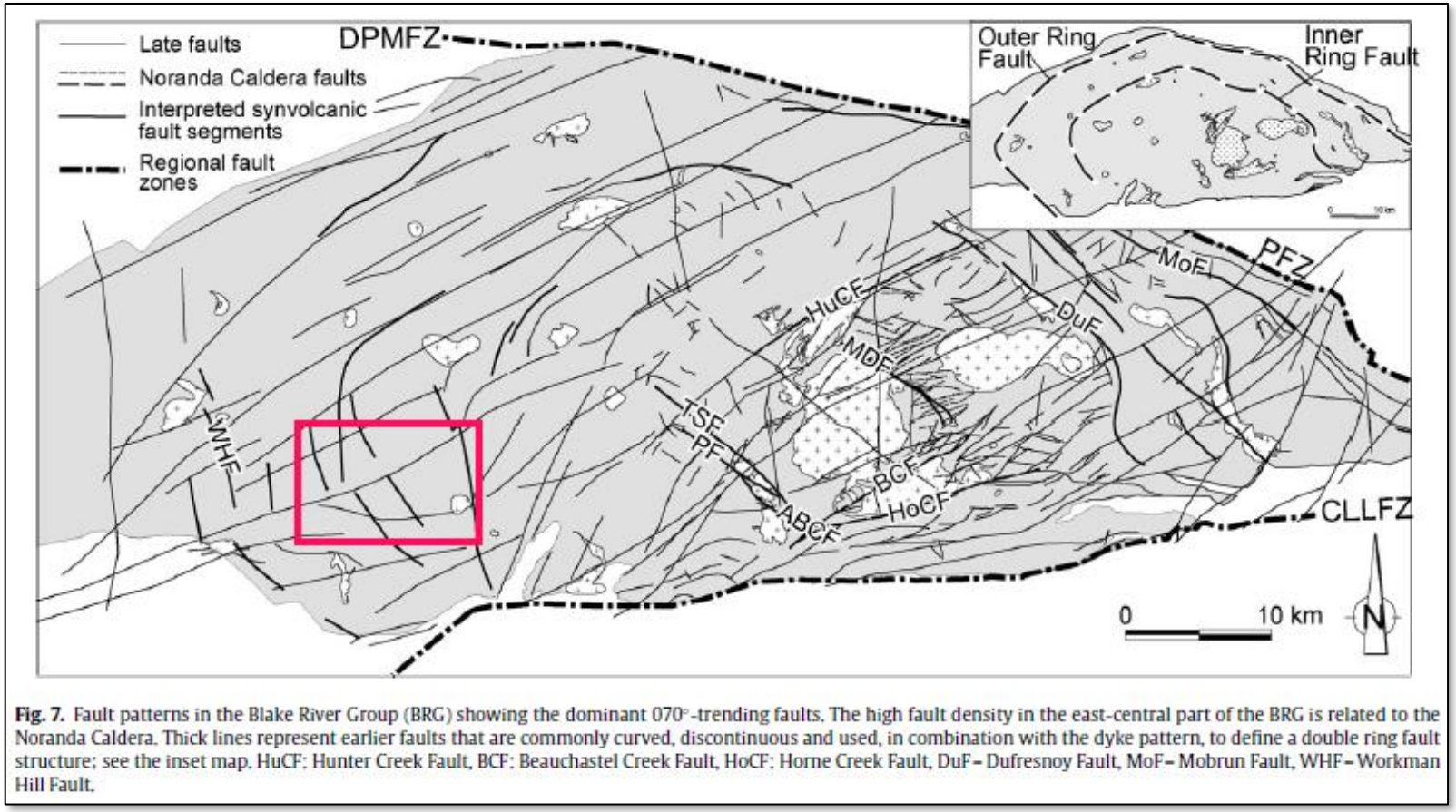


Fig. 7. Fault patterns in the Blake River Group (BRG) showing the dominant 070°-trending faults. The high fault density in the east-central part of the BRG is related to the Noranda Caldera. Thick lines represent earlier faults that are commonly curved, discontinuous and used, in combination with the dyke pattern, to define a double ring fault structure; see the inset map. HuCF: Hunter Creek Fault, BCF: Beauchastel Creek Fault, HoCF: Horne Creek Fault, DuF – Dufresnoy Fault, MoF – Mobrun Fault, WHF – Workman Hill Fault.

Figure 32 Fault patterns in the Blake River Group

From Pearson & Daigneault, 2009. Red outline approximate covers the TGM claim blocks. The dominant faults are ENE-WSW trending, probably transpressional P shears. The gold prospectivity of synvolcanic faults is unknown.

The TGM property lies within the red rectangle.

Another approach is the construction of a regional strain ellipse, with the DPFZ and LLCFZ as bounding shears – below. For an orogenic gold target, the main targets would be R^1, R and P shears

Consider the Blake River Group to be confined by a regional-scale, dextral dilational jog:

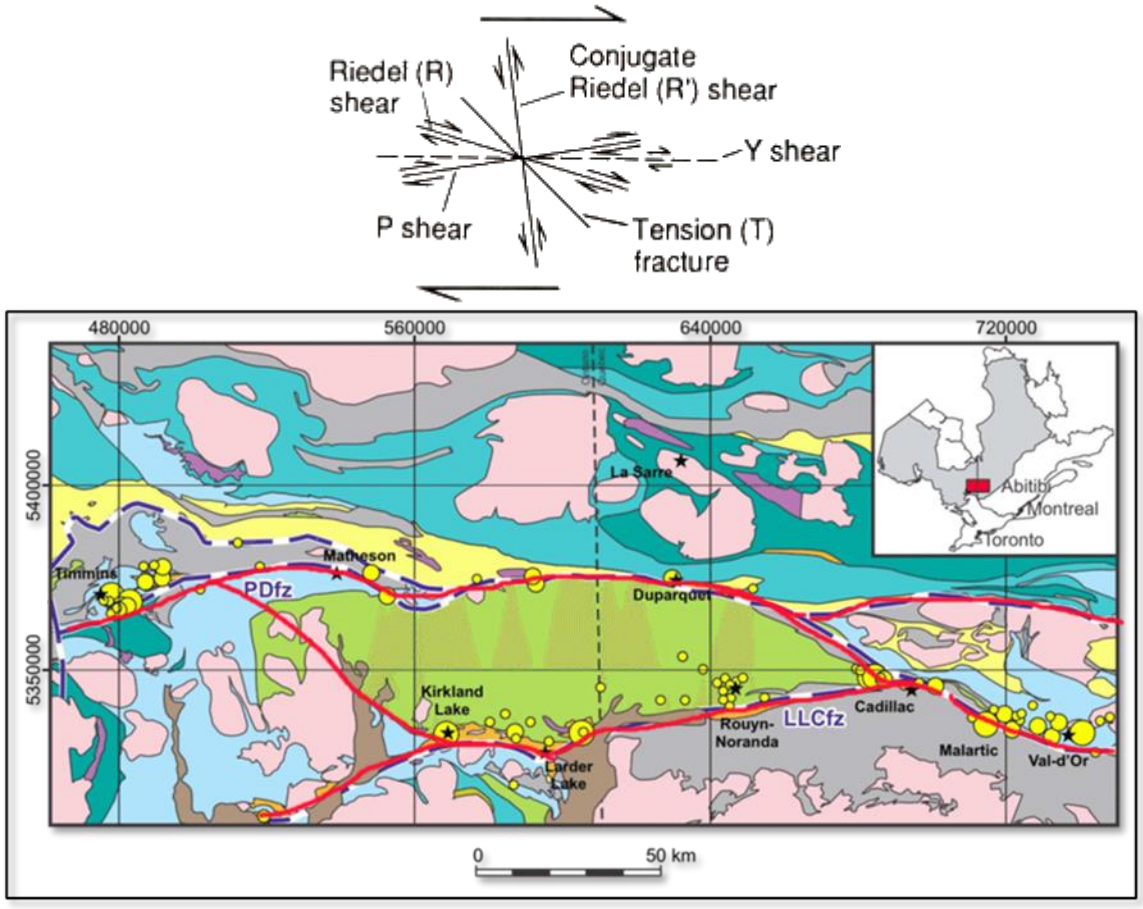


Figure 33 Major regional setting

5.0 SURFICIAL GEOLOGY

Abitibi Quaternary geology is relatively complex due in no small part to three major ice advances and with it, modification, erosion, and (re)-deposition of till. Below, from Veillette, 1968:

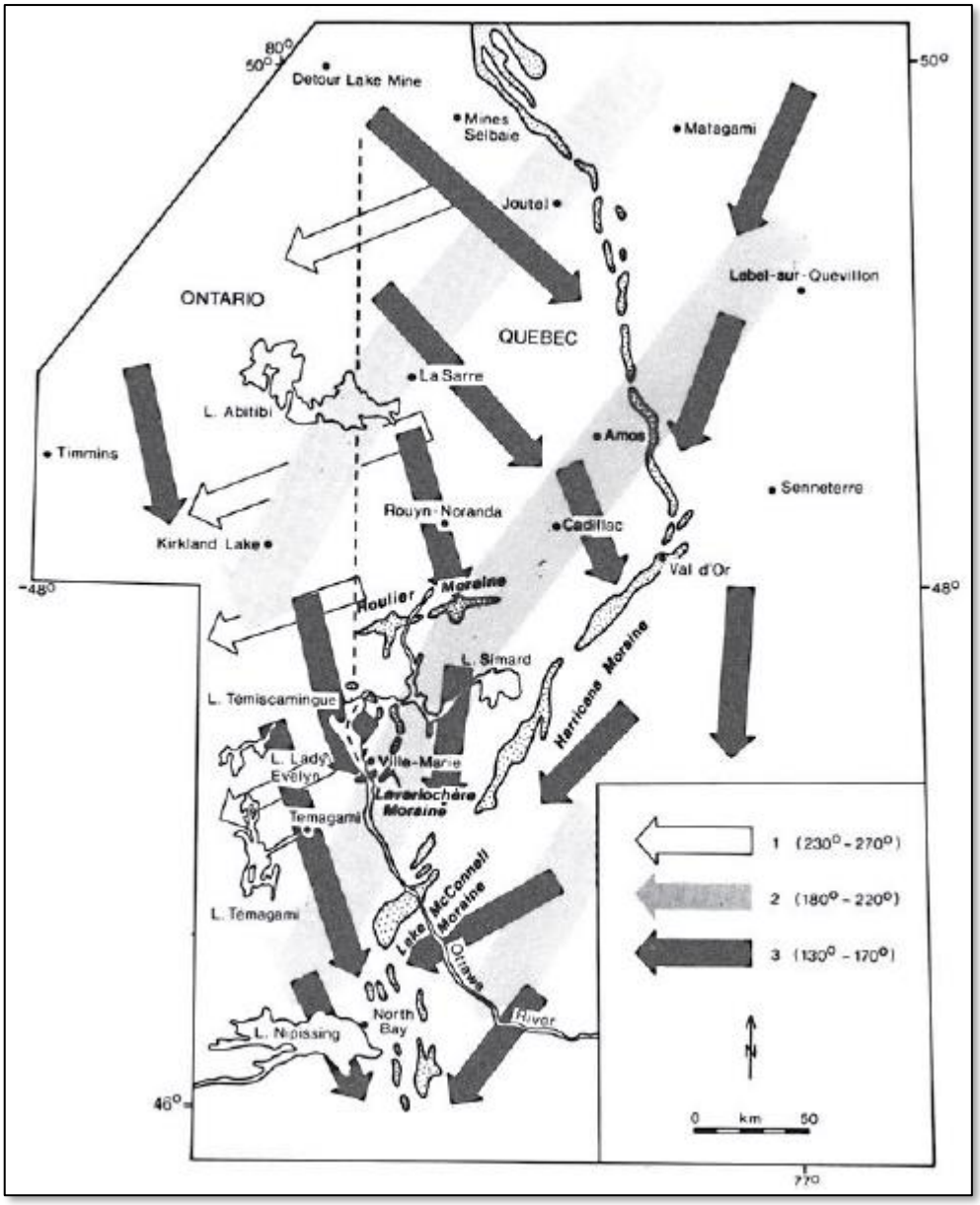


Figure 34 Regional ice directions

From Veillette, 1989: "Recent and extensive overburden drilling for mineral exploration purposes has unveiled a complex glacial stratigraphy that constitutes a complementary new tool for the interpretation of the ice flow history of the Abitibi-Timiskaming region. From oldest to youngest, ignoring isolated occurrences of older, poorly known glacial sediments not discussed here,

widespread till sheets consist of (I) a lowermost till associated with dominant west-southwestward and southwestward flows, (2) the Matheson till associated with both former west-southwestward and south-southwestward flows and a later south-southeastward flow and (3) the Cochrane till associated with southwestward, south, and southeastward flow directions.

“The change in flow direction that took place while the Matheson till was being deposited accounts for the lack of Paleozoic erratics from the James Bay Lowland in the easternmost and southernmost portions of the Matheson till. Deglaciation history inferred porn bedrock-inscribed ice flow indicators and geomorphological indicators is supported by the distribution of 43 radiocarbon ages on basal postglacial organic materials.”

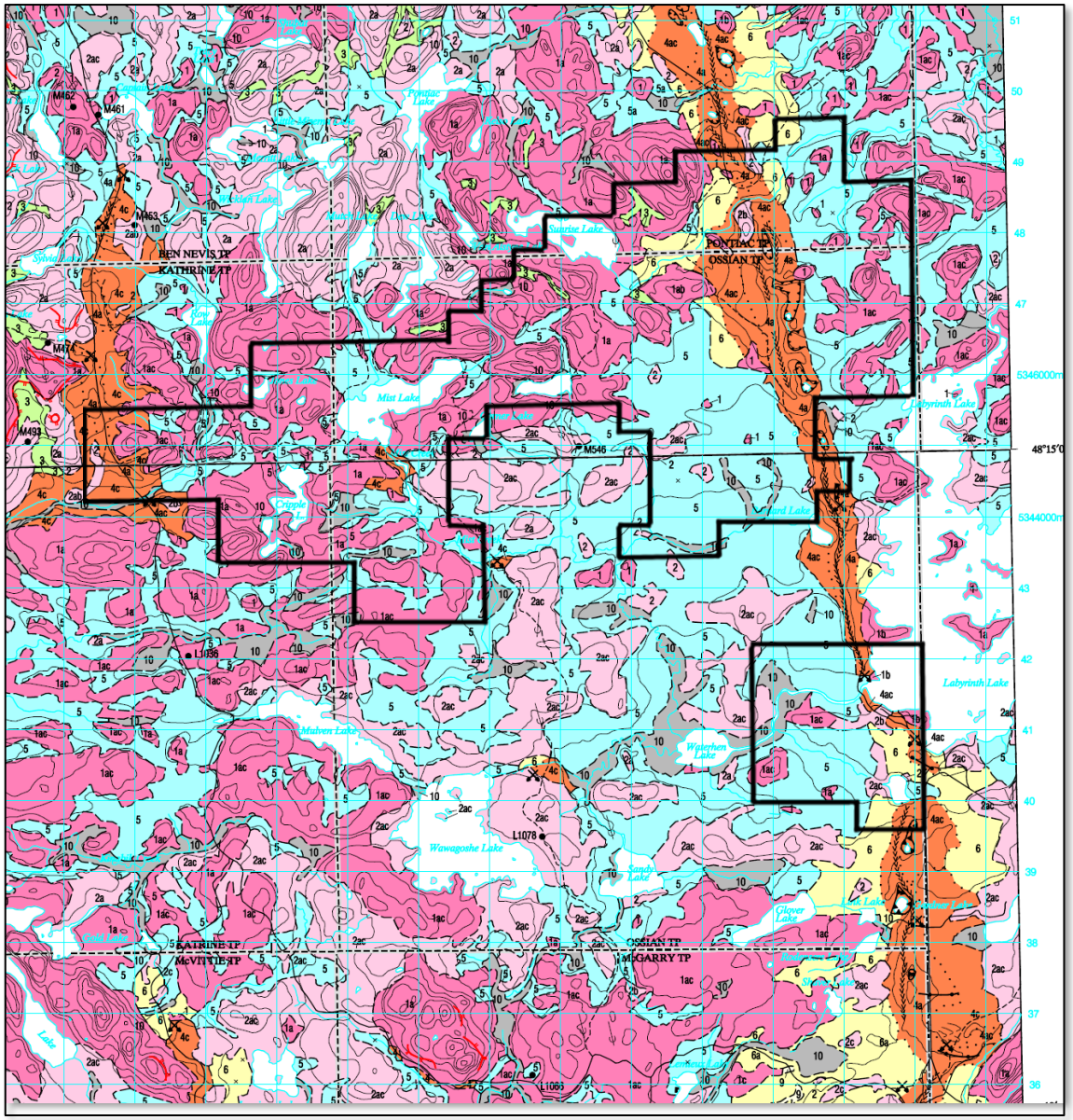
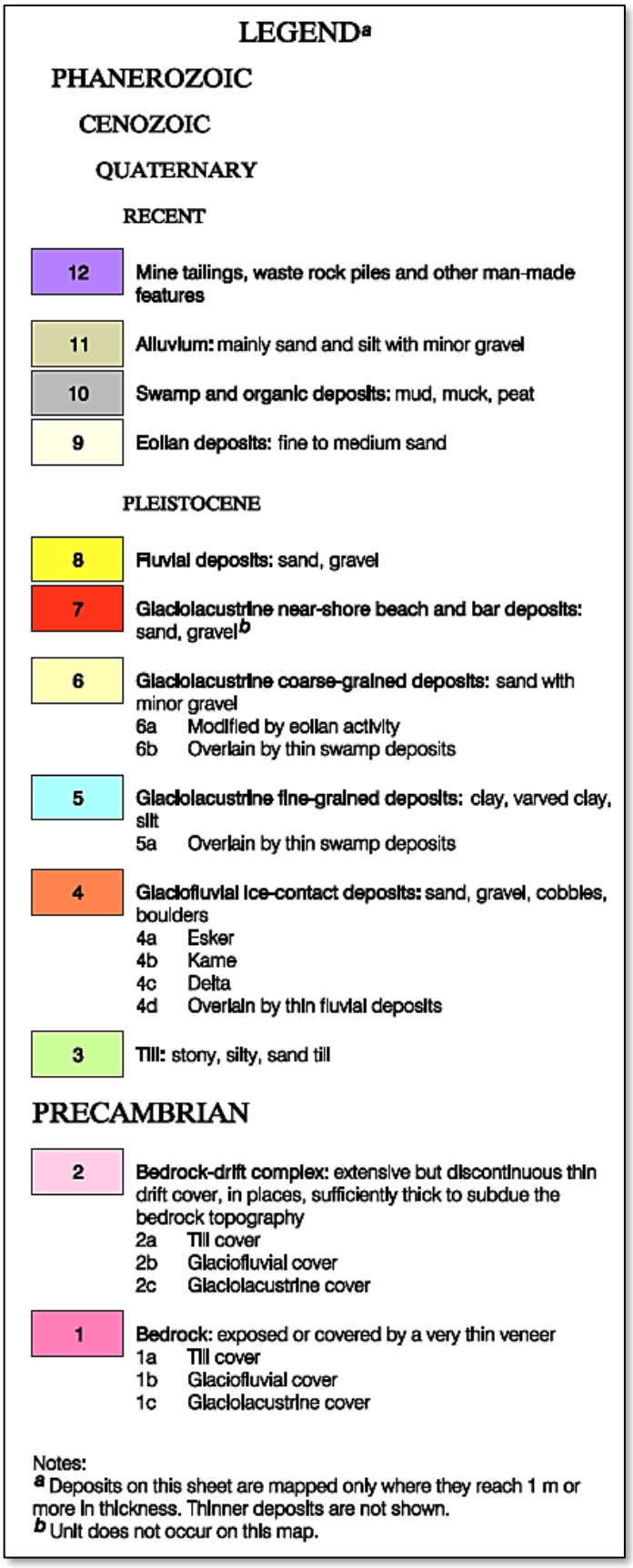


Figure 35 Regional surficial geology



Above from M2647 Larder Lake Quaternary Geology and M2648 Magusi River Quaternary Geology and based on Map P.2483 and P. , Baker et al, 1982. The regions' surficial geology landforms are dominated by the most recent glacial advance, ca. 160-180° az.

The glacial history of the region was described very broadly by Boissoneau, 1966, 1968, in part based on previous more detailed studies by O.L. Hughes and others.

All of Ontario underwent a series of major glacial advanced and retreats during the last major glacial stade, up to 12,000 years BP, with portions of Northern Ontario still ice-covered 8,000 years BP. There were notable separate domains within the Laurentide ice sheet, including the Hudson Ice with lobes advancing ENE to north-east out of Lake Superior, westward from Lake Huron, and NE up the St. Lawrence.

Glacial retreat was irregular, with the Cochrane surge advancing during the final period of deglaciation.

Overall ice direction for the latest (Wisconsinan) advance is SSE to south. Deglaciation of the Magusi River region took place before 10,000 years BP, with the majority of sediments considered to be of this age, though there may be pockets of the older Missinaibi Formation preserved.

Of the several glacial lakes formed during deglaciation, most relevant was Lake Barlow-Ojibway, south of the Tyrrell Sea which lay over the Hudson Bay lowlands. The sea and lakes did not

recede until around 6,000 years BP. The Cochrane Clay Belt to the west and north of the project area is a product of the formation of Lake Barlow-Ojibway.

From Veillette, 1994, "The evolution of Lakes Barlow and Ojibway, two large ice-contact glacial lakes that covered parts of northern Ontario and western Québec from about 10.1–8.0 ka BP, during the retreat of the Laurentide Ice Sheet, was reconstructed using deglaciation landforms, ice-flow indicators inscribed on bedrock, ^{14}C dates of early postglacial vegetation accumulated in lake basins, the distribution of *Mysis relicta* (a biological indicator of lacustrine submergence), varve chronology, and a detailed photogrammetric survey of the lake limit. Although the rate of ice retreat varied greatly throughout the basin, the average rate in Lake Barlow-Ojibway was 450 m/year. Rates of ice retreat deduced from varve chronology were assessed using predictable relationships between the lake limit, the shoreline gradient, and the rate of relative uplift. Over a 590 km long profile, the gradient on the maximum elevation of the lake defines a parabola that is attributed to restrained rebound, although in part it could be due to the position of the profile with respect to the overall uplift pattern generated by the ice sheet. The life span of the lake determined from varve chronology (2110 years) shows excellent agreement with the age difference obtained between that of marine shells overlying Lake Ojibway sediments at its northern end in Hudson Bay, and the oldest radiocarbon ages on basal organics in lakes in the southern part of the Barlow-Ojibway basin.

"Both lakes drained eastward through the Ottawa River between 10.1 and 8.0 ka BP, and the average yearly discharge to the North Atlantic Ocean during the last 1000–1500 years is estimated at about 946 km^3. At break-up of the ice sheet in southern Hudson Bay at about 8.0 ka BP, Lake Ojibway drained abruptly, releasing an estimated 114,396 km^3 of freshwater into the Tyrrell Sea and raising sea level by about 30 cm."

Baker, 1982 described widespread till in the area, material previously referred to as the Matheson Formation by Hughes (1959) and later, by Skinner (1973) as a stratigraphic equivalent to the Adam Till. Exposures are massive and dense to friable, and may have abundant, locally derived bedrock clasts. ''…the overconsolidated nature, clast shapes, and surface markings suggest this material to be deposited subglacially either as lodgement or subglacial melt-out till." Till thicknesses range from 0.5 to several metres with surface exposures oxidised and weathered to 0.5 m. Ice directions from outcrops indicate azimuth 165^o overall.

Two large esker systems dominate the area, with to the west of the property, (with marginal deposits underlying the far western claim), the Munro Esker running though Esker Lakes Provincial Park, and in the east, near the Quebec border, the Boundary Esker. The latter is on easternmost claims, forms a multi-ridged crest and reaches heights of 45 m, and an average width of less than 1 km. Smaller eskers are present to the west, in Ben Nevis Tp, and in Katrine Tp, on and near the property.

Glaciolacustrine deposits result largely from glacial lakes Barlow and Ojibway, with them formally named the Barlow-Ojibway Formation by Hughes, (1965). The deposits are divided into two broad groups, glaciolacustrine fine-grained sediments consisting of clay, varved clay and silt; and coarse-grained material consisting of sand and minor gravel. Coarse-grained sediments may represent a facies of glaciofluvial sediments or re-working of till or glaciofluvial deposits.

6.0 PROPERTY GEOLOGY

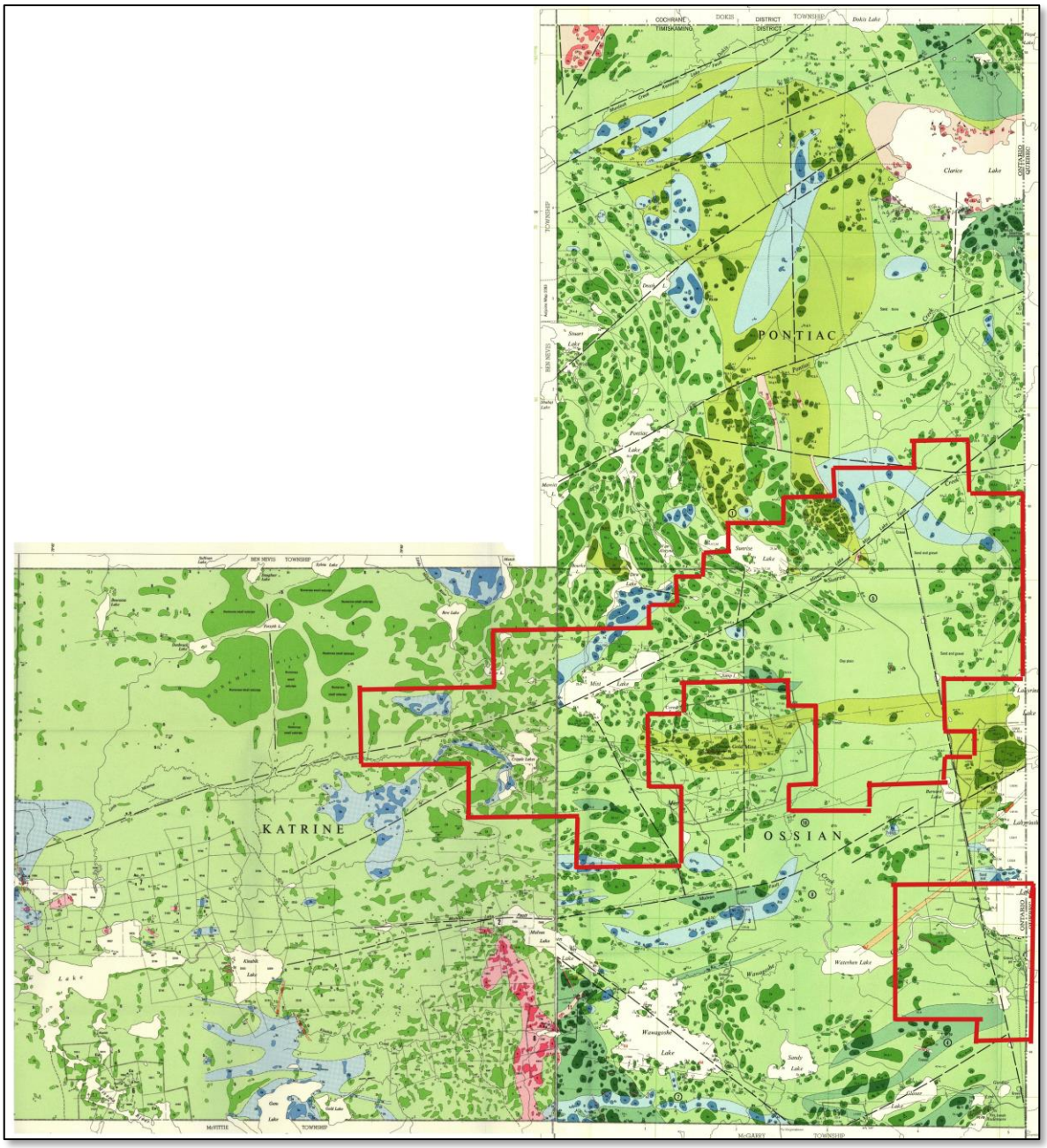


Figure 36 Property Geology

From OGS Geology Maps M2061 Arnold & Katrine tps & M2296 Pontiac & Ossian tps. TGM boundaries are approximate, 'best fit'. Overall, the LLP is underlain by N-S to NNW-SSE trending mafic-intermediate-felsic volcanic suite in the north-centre of the property, and generally E-W trending in the centre-south and south areas. Several poorly defined mafic, gabbroic late intrusions are known on and adjacent to the property. To the north, off-property, is the Clarice (Lake) felsic volcanic centre, broadly geologically similar to the centre in Ben Nevis Tp.

LEGEND

CENOZOIC[a]

QUATERNARY

PLEISTOCENE AND RECENT

Sand, gravel and clay.

UNCONFORMITY

PRECAMBRIAN[b]

MIDDLE TO LATE PRECAMBRIAN (PROTEROZOIC)

KEWEENAWAN

7 *Diabase (dikes).*

INTRUSIVE CONTACT

EARLY PRECAMBRIAN (ARCHEAN)

FELSIC INTRUSIVE ROCKS

6 *Unsubdivided.*
6a *Quartz diorite.*
6b *Granodiorite.*
6c *Quartz monzonite.*
6d *Feldspar porphyry (dikes).*

INTRUSIVE CONTACT

INTERMEDIATE INTRUSIVE ROCKS

5 *Unsubdivided.*
5a *Microdiorite (magnetic).*

INTRUSIVE CONTACT

MAFIC INTRUSIVE ROCKS

4 *Unsubdivided.*
4a *Gabbro and quartz gabbro.*
4b *Diorite and quartz diorite.*
4c *Hornblende gabbro.*
4d *Magnetite-rich gabbro.*
4e *Mafic pegmatite.*

INTRUSIVE CONTACT

VOLCANIC ROCKS

FELSIC VOLCANIC ROCKS

3 *Unsubdivided.*
3a *Massive rhyodacite and rhyolite.*
3b *Leucophyre (dikes).*
3c *Rhyodacite or rhyolite agglomerate or flow breccia.*
3d *Rhyodacite or rhyolite tuff breccia or lapilli tuff.*
3e *Rhyodacite or rhyolite tuff and ash.*
3f *Amygdaloidal rhyodacite or rhyolite.*
3g *Rhyodacite or rhyolite feldspar porphyry.*
3h *Rhyodacite or rhyolite quartz porphyry.*

INTERMEDIATE VOLCANIC ROCKS

2 *Unsubdivided.*
2a *Massive andesite or dacite (includes some diorite).*
2b *Pillowed andesite or dacite lava flows.*
2c *Andesite or dacite block lava and flow breccia.*
2d *Andesite or dacite agglomerate.*
2e *Andesite or dacite tuff breccia or lapilli tuff.*
2f *Andesite or dacite tuff.*
2g *Amygdaloidal andesite or dacite.*
2h *Andesite or dacite feldspar porphyry.*
2j *Dacite quartz porphyry.*

MAFIC VOLCANIC ROCKS

1 *Unsubdivided.*
1a *Massive basalt or basaltic andesite (includes some gabbro).*
1b *Pillowed basalt or basaltic andesite.*
1c *Basalt or basaltic andesite block lava and flow breccia.*
1d *Basalt or basaltic andesite tuff breccia.*
1e *Variolitic basalt.*
1g *Amygdaloidal basalt.*
1h *Basaltic andesite feldspar porphyry.*

Sil *Silicified zone.*

Au	*Gold.*
carb	*Carbonate.*
cp	*Chalcopyrite.*
ep	*Epidote.*
po	*Pyrrhotite.*
py	*Pyrite.*
q	*Quartz.*
qc	*Quartz carbonate.*

The OGS work indicated a series of indistinct mafic-intermediate-(felsic) volcanic cycles rather than stratigraphic repetition by folding or faulting. The regional magnetic data indicates overall, a quite flat signature and gross stratigraphic definition was and remains in large part from geochronological work. Various exploration programmes have detailed some of the stratigraphy (below), indicating time breaks defined by iron formation, possible sedimentary unconformities and volcanic (structural-stratigraphic) breccias.

The structural geology of the property area is poorly understood due to lack of systematic mapping, but with more information on lithogeochemical work relating to VMS exploration. The quite rapid change in overall strike between the NNW-SSE and E-W trend may be related to an early S_1 ENE-WSW event within Blake River Group that folded the northern stratigraphy, and the local strike-slip Misema Lake- Mist Lake fault having formed a boundary between this and the partially translated E-W stratigraphy. Much of the strain would have been taken up by the fault, preserving the (older) E-W volcanic trend.

However, this scenario would be at odds with the extensive volcanological work which indicates geological trends are more related to original volcanic edifice and flanking deposit morphologies.

The central portion of the main TGM block was described by Montgomery, 1996 as follows. It may have drawn heavily from Jensen's report.

"**Mafic Flows** (2A)
Two varieties of mafic flows are common on the property; pillowed flows and pillow breccia flows. Both varieties are green to light green in colour and fine-grained. The pillowed flows are characterized by thin (2-10 cm wide), soft, dark green chloritic flow selvages and spherical to bun-shaped pillows (0.3 to 1 m in width). Pillow tops are typically amygdaloidal (calcite filled) or vesicular when the calcite has weathered out.

"Locally the pillowed flows contain 10 to 20 per cent white feldspar phenocrysts. The pillow breccia flows are comprised of 50 to 70 per cent globular-shaped, very fine-grained, light green, small (10 to 50 cm diameter) pillows within a dark green chloritic tuffaceous matrix. The bleached light green pillows are loosely packed, non-interlocking, and have distinctive green chill margins. Their cores are amygdaloidal (quartz and calcite filled) and/or vesicular. Both matrix and pillows are often feldspar porphyritic. The pillow breccia flows are typically lenses within the pillow mafic flow sequences. The mafic flows are basaltic in composition and calc-alkaline in chemical affinity (Appendix B). They are slightly higher magnetically than the other units and often contain calcite alteration. They are located in the northeast corner, northwest and southwest portions of the property. In the southwest pillow directions are southward while in the northeast pillow directions are northward. The mafic flows and intermediate lapilli bomb tuffs form the limbs of an anticlinal structure on the property.

"Intermediate Lapilli and Bomb Tuffs (3B,lbt)
This volcanic unit is typically light green to green coloured, fine-grained and varies texturally from lapilli tuffs (2x3 cm fragments) to bomb tuffs (6x10 cm fragments). The light green to grey

coloured, felsic to intermediate (dacite) fragments are angular to elongate in shape and matrix supported. “Fragments comprise 10 to 40% of the unit. The matrix is very fine-grained chlorite-rich mafic to intermediate volcanic material which locally contains white feldspar phenocrysts (1-2 mm diameter).

“The intermediate lapilli to bomb tuffs are located mainly in the north and southcentral areas of the property. They are often intercalated with massive intermediate flows in the western part of the property. Lithogeochemical analysis indicates they are andesitic in composition and calc-alkaline in affinity (Appendix B). Foliation typically trends 080 degrees in the tuffs with fracturing at 020 and 350 degree directions.

“Intermediate Flows (3A,m)
These intermediate volcanics are light green to green, fine to medium-grained, massive flows with brecciated amygdaloidal flow tops. The flows are vesicular where the calcite filled amygdales have weathered out. These flows occur in the north-western area of the property. They are andesitic in composition and calc-alkaline in affinity.

“Felsic To Intermediate Ash-crystal Tuffs (4-3B,t-xt)
This tuff unit occurs as an east-west trending belt (approximately 300-500 m wide) in the central core of the property. The unit is generally light green, very fine-grained, hard, ash tuffs with local crystal tuffs (10-15% white feldspar phenocrysts). The tuffs are chemically rhyolite to dacite in composition and calc-alkaline in affinity(Appendix B). They are light grey to cream coloured when they are strongly carbonatized and/or silicified. The unit is well foliated as it occurs in the hinge of an anticlinal structure (Jensen, 1975). Pyrite mineralisation consisting of 5 to 15% very fine-grained pyrite disseminations and is commonly associated with distinct shears in the tuffs. These shears are often strongly sericitized.”

Montgomery, 1997 described 1996 100 m line spaced geological mapping on the neighbouring Ossian GML patented claims. It contrasts in several ways, notably considerably more exposure, 30%, and with it more felsic (rhyolitic volcanic) rocks.

Mafic to Intermediate Flows (2A/3A)
“These flows are massive or pillowed. The green to dark green pillowed flows are characterized by thin (2-5 cm wide) soft, dark green, chloritic flow selvages and elliptical shaped pillows (0.3 to 1.5 m in diameter). Pillow tops are typically amygdaloidal (calcite or quartz filled) or vesicular when the calcite has weathered out. Locally the pillowed flows contain 10 to 20 per cent white feldspar phenocryst^. Dark green, basaltic pillowed flows are found in the northern portion of the property. Paler green andesitic pillowed flows are located in the south and central portions of the property (Appendix B).

“The massive flows are green to pale green, fine-grained and typically homogeneous textured with 5 to 10% amygdules. Amygdules are quartz, calcite and/or black chlorite filled. These massive flows are mostly andesitic in composition.

"Intermediate Crystal to Lapilli Tuff (3B, xt to lt)
These intermediate crystal to lapilli tuffs are andesitic in chemical composition. They occur as a unit between the felsic tuffs and the mafic flows in the north. As well they are found locally within the mafic flow sequences. They are green, fine-grained, foliated tuffs comprised of 3007o pale green dacitic lapilli fragments to crystals (1-5 mm diameter) within green chlorite-rich very fine-grained andesitic matrix. These tuffs are typically calcite altered.

"Felsic Dacitic Ash Tuff (4B,t,d)
This unit has a pink tinted cream weathered surface. It is light green to reddish green (potassic alteration), very fine-grained to fine-grained, hard, massive, ash tuffs with2 to 15% dark green chlorite wisps to stringers. These dacite tuffs are moderately fractured to massive and locally foliated. Alteration consists of variably intense potassic alteration. The felsic dacite ash tuffs are part of the central felsic belt. Sections with intense potassic alteration have been mapped as subunits of the central felsic volcanic sequence.
Felsic Rhyolitic Ash Tuff (4B,t,r)

"The weathered surfaces of this unit are cream coloured or gossanous where pyritic. Three varieties of the rhyolite are present: 1) a light grey, very fine-grained, hard, silicified, ash to crystal tuff, 2) a brownish cream coloured, very fine-grained, soft, carbonatized, sheared to well foliated ash tuff 3) a pale green, very fine-grained, hard, ash tuff, with 2 to 3*%* green chlorite flecks. All three varieties contain very fine-grained disseminated pyrite mineralisation; the siliceous grey ash to crystal tuff contains 5 to 15 *(fa* pyrite, the carbonatized ash tuff contains 2 to 3% pyrite and the pale green tuff contains trace to 15% pyrite."

Major Mineralisation

OSSIAN GOLD MINES SHAFT AREA GEOLOGY AND MINERALISATION
The former Ossian Gold Mine shaft is located in the centre of the grid (LO,BL). An area covering 300 W to 150 E and 100 S to 100 N was geologically mapped in detail by the author, Montgomery. This carried out to "obtain a better understanding of the volcanic stratigraphy in the shaft area and to search for any other possible mineralisation in the area."

"The area is underlain by felsic volcanic stratigraphy consisting of rhyolite, dacite and potassic dacite tuff units. These units vary from massive to moderately foliated. Foliation trends 080^{o} to 110^{o}. Dips are steep 75^{o} to 90^{o} north or south. This would indicate proximity to the anticlinal axis of the felsic belt. A shear zone consisting of strongly sheared dacitic ash tuff was observed during mapping from L3 W 50 N to L1 W 10 S. This zone trends 085^{o} (MAP 2). Fracturing is also quite strong with the dominant direction being north-south. Two north-south cross cutting faults at LO and L1 E are interpreted to cut the stratigraphy (MAP 2). The LO fault was observed to occur in the shaft on the 90-foot level. More north-south faults may be present in the shaft area.

"A pyrite zone 10 to 15 m wide was discovered between L1 E and L2 E at 30 S. It has been traced for 100 m and appears to correspond with IP target TH-2 (Mihelcic and Webster, 1996). The zone

consists of 8 to10% very fine grained finely disseminated pyrite in light grey, silicified felsic crystal tuff. Only trace disseminate pyrite was observed in the rest of the felsic stratigraphy in the shaft area. All surface rock sampling returned values of less than five ppb Au.

“The old surface trenches near the Ossian Gold Mine Shaft were found to be overgrown with vegetation and partially filled with soil. Two technicians utilizing shovels and grubhoes were employed to clean out these old trenches as much as possible. Once these trenches were cleaned out, they were mapped by the author (MAP 3) and mineralised sections were channel sampled by the technicians.

“The Ossian Gold Mine quartz zones have been traced on surface for 165 m by the cross trenching. On the west side of the shaft, their appears to be two east-west trending quartz zones (MAP 3). A northern quartz zone (2.5 m wide) with contacts trending 85^{o} is exposed in the northern portion of trench K. The trend of its contacts suggests that it is not a splay off the main quartz zone.

“The main quartz zone strikes east-west through trenches J, K, H and l. It pinches north-south fracturing and or/faulting. This however is not clearly noted in the historical mine data. Old mine level plans show the main quartz zone to dip 50 to 65 degrees north.

“The large bulge in trench H could be the same bulge on the 90-foot mine level at 70 m west and 12m north of the shaft. If this is the case then the quartz bulge trends 265 degrees and plunges 28 degrees west.

“A small (1-1.5 m wide) quartz zone trending 320^{o} was exposed on the surface at 50 W, 13 S. This may be the same zone as the one located 75 m west and 25 m north of the shaft on the 90-foot level. The zone on the 90-foot level is 0.6 m wide and splays off the main east-west quartz zone. It trends 330 degrees and dips 35 to 55^{o} east.

“East of the shaft, the main quartz zone is much narrower 1.6 to 0.3 m wide and has been traced on surface for 75 m. It trends 070^{o} for the most part but flexes north-south at BL, 30 E. It dips 60^{o} to 80^{o} to the south. Early diamond drilling results east of the shaft were not as spectacular and promising as west of the shaft. Therefore, only 40 feet of underground drifting (90-foot level) was conducted on the east quartz zone. C.

“W. Morrison reported in 1926 it was only 1 to 2 feet wide and occurred in a well-mineralised. The quartz zones are milk white coloured, very fine-grained quartz with iron oxide stained fractures. Locally, 2-3% chlorite filled microfractures are present. Fracturing is moderately intense with two dominant directions 110^{o} and 350^{o}. Sulphide mineralisation in the quartz zones consists of 0.5 to 3% fine-grained disseminated cubic brassy pyrite. The quartz zones are hosted by sheared pyritic rhyolite ash tuffs. In proximity to the quartz zones, they contain 2 to 10% fine-grained to medium-grained disseminated cubic pyrite. The tuffs are often highly gossan weathered. They are typically cream to very pale green, very fine-grained, siliceous ash tuffs with occasional 2 to 5% chlorite specks or stringers and 5 to 20% quartz stringers/ veinlets.

“Underground the rhyolite ash tuffs are described as being massive and variably altered as indicated by colour variation of greenish grey, pink and brown. Hydrothermal alteration close to the quartz zones consisted of chlorite, carbonate, and sericite. The greenish colour in the rocks was due to the presence of chlorite along slip planes (Hopkins, 1928).

“To the west, underground, the main quartz zone on the 90-foot level averages 5 feet wide and at one point is 25 feet wide, P. E. Hopkins attributes this width increase to partly a fold in the formation and partly to overlapping by faulting while C.S. Longley describes it as a horizontal roll of the zone. On the 200-foot level, the vein averages 5 feet in width for a length of 200 feet.

“Pyrite mineralisation underground seems to be concentrated near the footwall associated with the pyritic quartz zone material. The quantity of pyrite however was not an indication of the tenor of the gold. The pyritic rhyolite contacts of the quartz zone were not likely sampled as the width of the quartz zone often exceeded the drift width (Longley C.S., 1949).

“A total of 74 samples were collected from the trenches with the vast majority being channel samples. A total of 15 samples (2007) returned gold values greater than 3 g/tonne. of these 15 samples, 13 samples were quartz material. The highest gold value obtained from the quartz zones was 20.49 gpt. Au/1.6 m (0.59 opt. Au/5.25 ft.) and from the pyritic felsic ash tuff host rock 3.04 gpt. Au/1.0 m (MAP 4). Historically the highest quartz surface channel sample recorded is 0.63 oz. Au /ton. over 4 feet.

“West of the shaft, quartz zone composite gold sections include 4.32 gpt. Au/2.7m and 3.00 gpt. Au/3.9 m. Along the contacts of the quartz zones with the host pyritic felsic ash tuffs, composite gold sections include 2.80 gpt. Au/2.0 m, and 2.60 gpt. Au/1.7m. The Au/2 m and 1.38 gpt. Au/3.25 m from both quartz zones and felsic ash tuffs (Map 4W).

“East of the shaft, channel cuts of 20.49 gpt. Au/1.6 m,11.19 gpt. Au/1.0 m and 8.60 gpt. Au/0.7 m were obtained from the east quartz zone. Composite golds sections, a mixture of the east quartz zone and host pyritic felsic tuff, were 8.18 gpt. Au/4.2 m and 2.89 gpt. Au/1.95 m (Map 4E).” (Heisley K.B., 1939).

Only a couple of kilometres east of the property, in Québec, the closest and only economic gold producer within 10 km:

MINE DASSEN aka Rocmec, Russian Kid Canton Dasserat Rang VIII 32D04 E610901 N5344729

Discovered in 1924 by prospecting and trenching by A.W. Balzimer, (the original ‘Russian Kid’) and Mike Mitto, a shear-hosted, quartz vein gold deposit with estimated resources of 570,000 t. The host is quartz diorite, gabbro, granodiorite and andesite. When Corp. Falconbridge Copper acquired the mine area through staking on the 17th June, 1981, the subsequent report described the host as ‘a major gabbroic dike which has a horseshoe shape and can be followed for over 10 km.” They considered it in part fault-controlled, with the northern limb paralleling the Hunter

Creek fault to the east and the southern limb following the extension of the Quesabe fault. The 'Horseshoe gabbro in the mine area varies from a gabbro or diorite in the north to quartz diorite and granodiorite phases near the southern contact…." It strikes 070/65-70. (PQ govt. files).

F. Scott's 1983 report refers to the dyke as a hydrothermally altered sill, with auriferous veins also in the surrounding volcanic rocks south of the gabbro.

From SIGEOM, with Google translation/corrections:

The mineralised zone is generally oriented 090°/68° over a length of nearly 2000 m. It is made up of several sub-parallel or parallel metre to decametre-scale typically veined zones. The mineralisation has been drilled from surface to a depth of 457 m. In 1986, the mineralised zone remained open laterally and below the 457 m level. Up to 13 areas/veins have been identified.

The drilling and compilation work carried out in 1984-1985 (GM 57624 and GM 57625) revealed the following zones/veins:

Zone 3 (including the McDowell, Russian Kid and McDowell-West veins);

Zones A and B (including the Talus, Beaudoin and Talus-Ouest veins), Lachance; Shaft; Claude-Ouest (Zone 1);

Zone 2 and Zone 4.

The main zone, the McDowell vein, also called Zone 3 (GM 57625), measures 945 m in length including the McDowell-West and Russian Kid veins which represent respectively the western and eastern extensions of this zone. (GM 57624). Excluding these extensions, the McDowell Vein measures over 488 m long by 152 m in extension along the dip, and a width of 3 m. It is oriented N075 ° to N090° with dips varying from 55° to 60°. The Russian Kid vein (GM 26449) outcrops in trenches in the NW corner of NTS 32D03. The second most important zone is the Talus vein, also called Zone A (GM 57625). This vein, located approximately 60 m north of the McDowell Vein, is nearly 1,100 m in length and is 8 m or less in thickness. It was traced near the surface to a depth of 270 m, and is oriented N070 ° to N085 ° with dips varying from 55° to 75° towards the south. Several veins are attached to this zone, in particular zone B which is located a few metres north of zone A (GM 57625) and the Beaudoin and Talus-Ouest veins. The Beaudoin vein is 274 m in length (GM 57624).

The Claude-Ouest Vein, also called Zone 1 (GM 57625), measures around thirty metres in length. It is oriented N070° to N090° with dips varying from 50° to 60° towards the south. Zone 2 (GM 57625) is approximately 125 m in length and follows an orientation N070 ° to N090 ° with a dip of 50° to the south. Zone 4 corresponds to a weak mineralisation located just south of Zone 2 (GM 57625).

The 2006 drilling led to the discovery at depth of two new mineralised zones, the Boucher and Boucher 2 veins in addition to confirming the extension at depth of the Shaft, Talus and McDowell zones. The Boucher zone is located 165 m from the 'wall' of the McDowell zone encountered at

325.77 m. The Boucher Zone 2 is similar to the Boucher Zone, but it is located 25m north of the Boucher Zone 'wall' 190m north of the McDowell Zone. The gold potential at depth remains present and the extensions of the mineralised zones remain open in all directions. (GM 62961)

Geology

The host rock consists of a large, differentiated sill several kilometres in length and nearly 600 m in width (ed. – since considerably reduced in width by drilling and possibly UG work). This intrusion is oriented ENE-WSW and cuts andesitic to basaltic lavas of the Blake River Group. The sill is characterized by several lithological facies ranging from gabbros to quartz diorites and diorites to more felsic rocks of granodioritic to tonalitic composition. Overall, mafic facies are found in the northern part of the sill. Mineralisation is mainly distributed in altered and sheared diorites (GM 57624 and GM 57625).

Mineralisation

Mesothermal vein gold, with quartz-carbonate gangue. Mineralisation consists of 2 to 10% fine-grained disseminated pyrite in the shear and breccia zones affecting the diorite. Numerous quartz veins, from a few centimetres to almost 60 cm in thickness are frequently found in these areas. These veins are slightly pyritized and occasionally contain chalcopyrite or visible gold. Bands of massive pyrite are sometimes present at the edge of quartz veins. The best gold grades are associated with these bands and also with disseminated and fine-grain pyrite associated with chlorite. The mineralised zones also contain less than 1% scheelite (level 300'). The relative proportion of this mineral seems to decrease at depth (GM 57624 and GM 57625). Diorites, which constitute 50% to 80% of rocks, are coarse-grained, mainly massive or porphyritic with idiomorphic feldspar and prismatic amphibole. They are sometimes magnetic (0-10% magnetite) and with up to 5% coarse grey leucoxene present in epidote-rich areas. The mineralised and pyritized zones are strongly to moderately altered and enriched in silica, epidote, carbonate, chlorite and sericite (GM 57625).

Structural Controls

The mineralisation is associated with an east-west fracture/shear system, more or less parallel, out of phase in several places by prominent transverse faults with mostly small displacements. Some of these transverse faults have however, produced relative displacements of more than 30 m (e.g., El Coco fault). The orientation of the mineralised structures varies from N070° to N090° with dips of 55° to 80° south. The dislocations caused by transverse faults coupled with shear forces are the cause of the discontinuous nature of the mineralisation. Fractures and tension veins have also developed around the sheared areas. These are highly silicified, very well foliated and are characterized by very fine-grained cataclastic to mylonitic structures containing visible or pulverized fragments (GM 57624 and GM 57625).

Alteration

The mineralised zones are generally strongly silicified and bleached and consist of finely grained and foliated rocks. Siliceous sulphidic hydrothermal fluids, transformed the diorites into quartz diorites and rocks of tonalitic to trondhjemitic composition. In these pyritized shears, alteration is characterized by strong silicification, moderate carbonatization and sericitization and weak to very weak chloritization. Sericitization is better developed in the granodioritic and tonalitic facies, while chloritization is found especially in the mafic, gabbroic facies. Alteration forms an envelope from a few metres to nearly 40 m thickness, which surrounds and includes the mineralised zones. The presence of more distal, strong and continuous alteration in the epidote is generally a precursor to the formation of silicified, pyritized diorites. The walls of the quartz veins in the mineralised shear zones are marked by strong silica, carbonate, epidote and chlorite alteration. Finally, the pyrite-rich zones are limonitized near the surface (GM 57624 and GM 57625).

Comments

Grades: Hole RS-01-17 cut an interval of 0.551 g / t over 1.0 m from 98.0 to 99.0 m (GM 70386). The best grades indicated by the 2006 drill holes are (GM 62961): 32.92 g / t Au over 1.45 m between 490.75 and 492.20 m (Boucher Zone, Sond. RS-06-01); 3.906 g / t Au over 3.77 m between 519.03 and 522.80 m (Boucher Zone 2, Sond. RS-06-01); 1.06 g / t Au over 0.50 m between 350.85 and 351.35 m (McDowell Zone, Sond. RS-06-03).

Previous Work:

From 1924 to 1945, exploration work was concentrated in the region of the Russian Kid Vein.

A shaft was sunk to 300 ft in the 1940's (there is scant information on precisely when), and two levels developed, 150 and 300 ft.

After 1945, exploration work was carried out mainly on the well area (610 m west of the Russian Kid vein) as well as on an area 1375 m west of the Russian Kid vein. The presence of tungsten revived interest in this sector in 1951.

A sampling carried out in 1952 shows 0.1% WO_3 over 1.83 m (248.7 m section of a gold vein, Level 300-L), (Federal deposit sheet 50366600).

Ca. 1974, during the Gold Hawk – Somed company transition, the following work had been completed (from Somed 1974 report):

The Talus vein has been developed on the 150-foot level, over a length of 420 feet, where it has an average width of 2.3 feet and an average grade of 0.35 oz Au/T uncut and 0.24 oz Au/T cut. It was further developed in the 300-foot level over a length of 200 feet, where its shows an average width of 2.1 feet with an average grade of 0.82 oz Au/T uncut and 0.50 oz Au/T cut.

The McDowall vein was developed on the 300-foot level, where its length, width and grade can be summarized as follows:

SECTION AVERAGE	LENGTH AVERAGE	WIDTH UNCUT	GRADE CUT	OZ.AU/T
3050-3350	300	3.0	0.35	0.27
3450-3650	200	2.9	0.29	0.11
3650-3850	200	2.7	0.35	0.25
3850-4030	180	2.5	0.18	0.16

Several other veins were intersected by the diamond drilling. On the West side of the mine workings three such veins, referred to as veins No. 1, No. 2 and No. 3, in the present report, contain interesting gold mineralisation. The vein No. 3 is most likely the western extension of the McDowall vein.

On the East side of the mine workings the four main gold bearing veins have been designated veins: A, B, C and D, in the present report. Again, vein C is probably the eastern extension of the McDowall vein.

In 1986, the mineralised zone remained open laterally and below 457 m depth. There was a ramp which served three levels (150 ', 300' and 500 ') and several thousand metres of crosscuts and galleries. The old shaft had been rehabilitated up to level 300 '. Several gold-rich samples were analysed for silver, with grades ranging from 1.37 g/t Ag to 13.71 g/t Ag (GM 57624).

In the 1989-90 Canadian Mines Handbook, it was noted that reserves estimated in 1984 were 1.324 Mt grading 8.07 g / t Au. These are total reserves (proven + probable + possible + resources). Excluding a resource of 200,000 tonnes in the Talus vein, total reserves of 1.124 Mt at 8.36 g / t Au were calculated (ABBDL-Tecsult, GM 57624). (DV 87-01, p.16; Canadian Mines Handbook 1989-90, p.141; GM 57624, p.59-65.)

In 2007, measured resources were estimated at 91,000 t at 6.72 g/t Au, indicated resources at 274,000 t at 6.37 g / t Au and inferred resources at 955,200 t at 10.37 g/t Au, these with a cut-off grade of 3 g / t Au. (March 20, 2007, Geostat, NI 43-101 Technical Report filed on SEDAR March 21, 2007).

In 2010, measured resources were estimated at 124,800 t at 6.95 g/t Au, indicated resources at 445,400 t at 6.40 g / t Au and inferred resources at 1.51 Mt at 7.40 g/t Au, these with a cut-off grade of 3 g / t Au. (May 25, 2010, SGS, NI 43-101 Technical Report filed on SEDAR June 1, 2010).

The total reserves (proven + probable + possible) for each zone are (GM 57624):

404,458 tonnes at 6.17 g / t Au (McDowell vein);
132,950 tonnes at 6.51 g / t Au (Talus vein);
31,399 tonnes at 6.17 g / t Au (Russian Kid seam);
284,671 tonnes grading 12.68 g / t Au (Beaudoin vein);

7,920 tonnes at 6.17 g / t Au (Lachance vein); 1
66,675 tonnes grading 8.57 g / t Au (Talus-Ouest vein);
61,380 tonnes grading 6.51 g / t Au (McDowell-West vein);
27,706 tonnes at 7.20 g / t Au (Shaft vein);
7,370 tonnes at 22.28 g / t Au (Claude-Ouest vein).

Reserves are evaluated at 1.18 Mt at 6.22 g / t Au down to 457 m depth (DV 87-01).

As of September 30, 2010, the measured and indicated resources were 0.57 Mt @ 6.52 g / t Au; inferred resources 1.51 Mt @ 7.4 g / t Au (SGM - Mines and projects). In 2010, measured resources are estimated at 124,800 t at 6.95 g / t Au, indicated resources at 445,400 t at 6.40 g / t Au and inferred resources at 1.51 Mt at 7.40 g / t Au with a cut-off grade of 3 g / t Au. (May 25, 2010, NI 43-101 Technical Report filed on SEDAR June 1, 2010)

Document sources: DPV 743, DV 2013-01, DV 2014-01, ES 002, GM 00056-A, GM 00056-B, GM 00365, GM 00471, GM 00699-A, GM 00699-B, GM 01221-A, GM 01221-B, GM 02638, GM 05434, GM 05555, GM 09459-A, GM 09459-B, GM 09460, GM 09469, GM 09473, GM 09474, GM 09478, GM 09480, GM 09482, GM 09489-A, GM 09489-B, GM 13389, GM 22384, GM 22581, GM 26449, GM 28730, GM 29588, GM 29797, GM 34630, GM 35456, GM 37114, GM 39228, GM 41154, GM 42074, GM 44016, GM 44017, GM 57624, GM 57625, GM 61112, GM 62961, GM 70386, MB 86-14, RG 020-III, RP 116, RP 135, RP 227, RP 256, RP 330, tous 66 in total:

Release date: 25.1.2019

From the SGS Technical report, 2011:

History

Since the initial discovery in the 1920's and up to mid-80's, there has been fairly constant exploration work undertaken on the property. Between 1934 and 1983, more than 30,000 metres of diamond drilling, a 98-metre-deep shaft, 844 metres of ramping, 1,729 metres of galleries and 187 metres of raises (sic) were completed. Metallurgical tests were carried out at the Centre de recherche minérale du Québec (CRM) in 1984 and in 1981, custom milling of 9,366 tons of ore from the McDowell Vein by El Coco.

In October 1924, A.W. Balzimer and M. Mitto claimed the area with the gold discovery near the actual ramp. Exploration work was concentrated in this part of the property and consisted mainly of stripping and trench sampling. In 1934-35, Sylvanite Mines drilled 1,111 metres on the property. Later, Erie Canadian Mines drilled 10 holes before Bordulac Mines bought the property in 1945. The company did an extensive exploration programme spread out over several years. Between November 1946 and September 1947, Mines Bordulac drilled several holes totalling 4208 metres. Core recovery did not exceed 70% and reached 30% locally. During the summer 1946, geologist H.S. Scott published a geological report on the property. A 46-metre shaft with two (2) compartments was sunk in 1948-49. Approximately 308 metres of drifts were dug at level 150 (ft), later called level 45, to explore the Talus vein previously discovered during a surface

drilling campaign totalling 2,225.04 metres. Another diamond drilling campaign of 640.08 metres led to the discovery of the McDowell vein. The shaft was deepened to a 97.54 metres depth and 493.78 metres of drift were dug at level 300 (ft), later called level 90, to intercept the McDowell vein. In 1952, underground work was suspended and the mine was flooded.

In 1956-57, an electromagnetic survey was carried out over the eastern end of the gold bearing corridor. A drill programme may have been completed in the area but no results are available.

From 1961 to 1963, 30 diamond drill holes totalling 7,650.18 metres verified the in-depth extension of the mineral-bearing structures. Mr. C.W. Archibald prepared a study for North Bordulac Mines, (previously Bordulac Mines) for future mine production of the deposit.

In 1967, a diamond drilling campaign totalling 2,114.40 metres was done to define some targets close to surface.

In 1969, Gold Hawk Exploration optioned the property and carried out 10 diamond drill holes from surface.

In 1972, Gold Hawk Mines bought the mine. It built an access road, pumped out the mine and carried out a sampling program at level 300 (ft), later called level 90. Also in 1972, Kerr Addison Mines optioned the most of the property and carried out a large ground geophysical survey (magnetic and electromagnetic) in sectors away from the known gold bearing zones. That same year, Some Mines of Montreal optioned the remainder of the property and dug a ramp of 134.11 metres in order to exploit the Russian Kid vein (the original discovery). It also prepared a detailed study of the geological resources in place but decided not to exert its option. The report is not in the author's hands.

In 1978, Explorations El Coco acquired the property and built an all-year access road, constructed buildings including offices and a machine shop, and installed compressors and generators. From 1979 to 1981, the company extended the access ramp down to level 425 (ft) later called level 130, totalling 814.43 metres. It also completed 454.15 metres of drifting at level 150 (ft), later called level 50, 201.78 metres at level 300 (ft), now called level 90, and 203.00 metres at level 425 (ft) later called level 130 (m), and excavated six shrinkage stopes at level 300 (ft), later called level 90 (m), for bulk sampling.

Additional sampling was carried out from January 1981 to January 1982. Gold prices dropped (to less than $US325) during the ensuing months. During this period, 9,366 tons were sent for custom milling to the mill of the Belmoral Mines. At the end of the 1982 production year, an evaluated quantity of 15,625 tons was left on the property of which 4,313 tons was left at the surface. In 1983, Metalor (in a joint venture with El Coco) drilled 30 surface diamond drill holes (TF- holes) totalling 5443 metres and 24 underground diamond drill holes totalling 1 634 metres. Also, development work totalling 187 metres of raises (levels 150(ft), 300(ft) and Q5), 562 metres of drifts (levels 300(ft) and 425(ft)) and 31 metres of ramp development (level 425(ft)).

In March 1984, Asselin, Benoit, Boucher, Ducharme, Lapointe, Inc (ABBDL - TECSULT) submitted a feasibility study of the property. The study reported total resources and reserves of 1,124,532 tons grading 0.247 oz/t Au (43-101 non-compliant). The best production scenario envisaged profit at 300 tonnes/day on a 240 work days annual basis. The calculation was made using an average grade of 0.19 oz/t Au, a 95% recovery and a 10% dilution. Metallurgical tests were carried out at the Centre de recherche minérale du Québec (CRM) in 1984.

In 1985, Dassen Gold Resources Ltd. acquired a 90% interest on the property, the remaining 10% belonging to Consolidated Gold Hawk Resources Inc. A diamond drill campaign totalling 4,095 metres was carried out in order to investigate the possible extensions of the known gold bearing veins.

No work was undertaken on the property after 1986. Dassen Gold Resources Ltd. had a legal conflict with the lender and the company was sued. Dassen went bankrupt in January 2000 and KPMG Inc was appointed as liquidator at the request of the Royal Bank of Canada, the applicant.

In April 2003, Les Enterprises Minières Globex Inc. bought the current property from KPMG Inc.

In April 2005, Mirabel Resources Inc. made an agreement with Les Enterprises Minières Globex Inc. for an interest of 100% of the Russian Kid property in exchange of cash and shares.

In 2005, approval for mine dewatering

In January 2006, Mirabel Resources Inc. legally changed its name to Rocmec Mining Inc.

In July 2006, Rocmec Mining Inc. became the legal owner of the property, and without any unpaid bills.

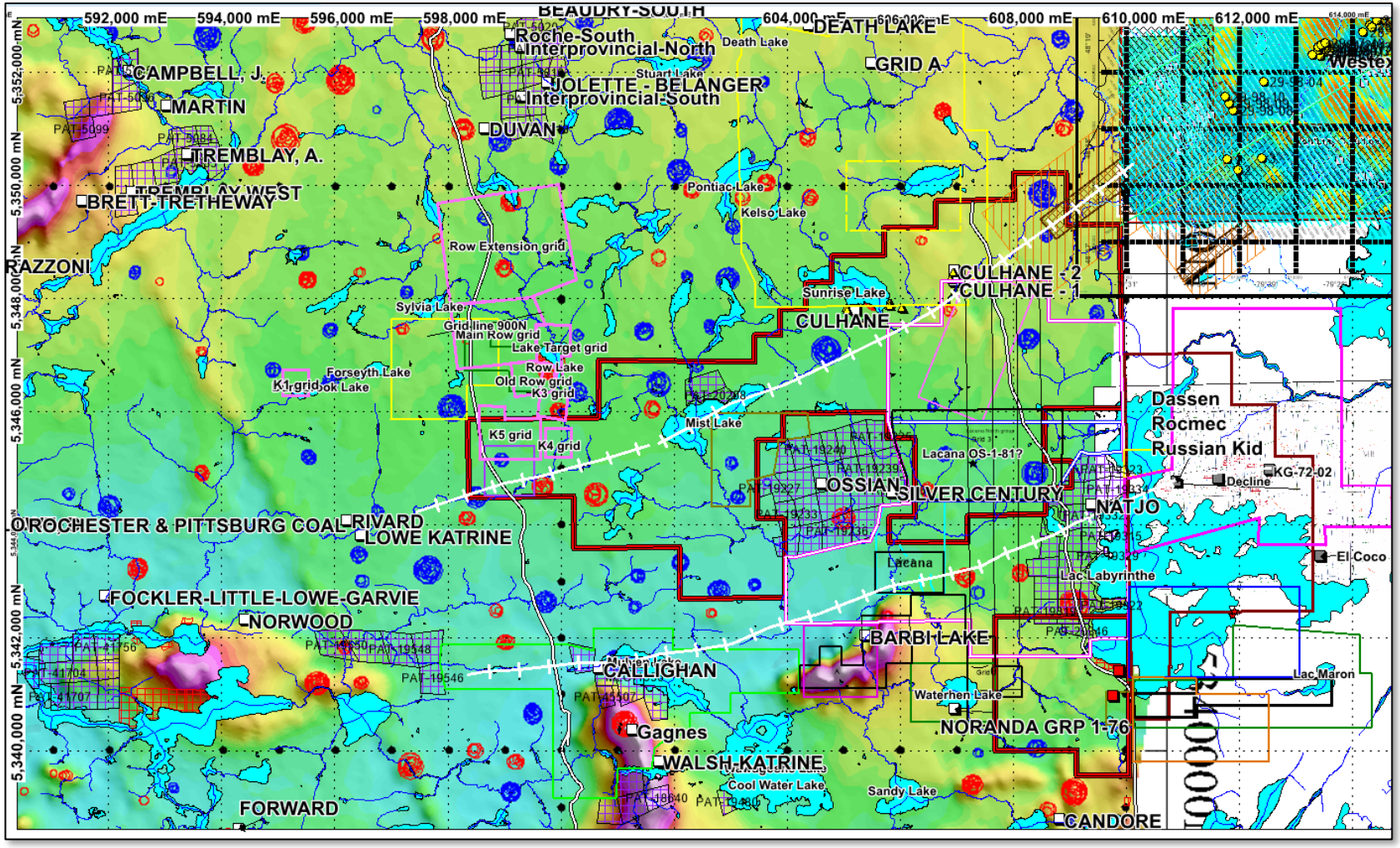


Figure 37 Regional magnetic data

Regional magnetic data, main showings, historic property locations. The trends of the Misema Lake – Mist Lake and Mulven Lake faults are shown in white. Locations are based on the regional OGS mapping. These structures may be genetically related to the Cadillac-Larder Lake Break. TGM block locations are approximate.

6.0 DEPOSIT TYPES

The targets are greenstone-hosted orogenic lode gold deposits

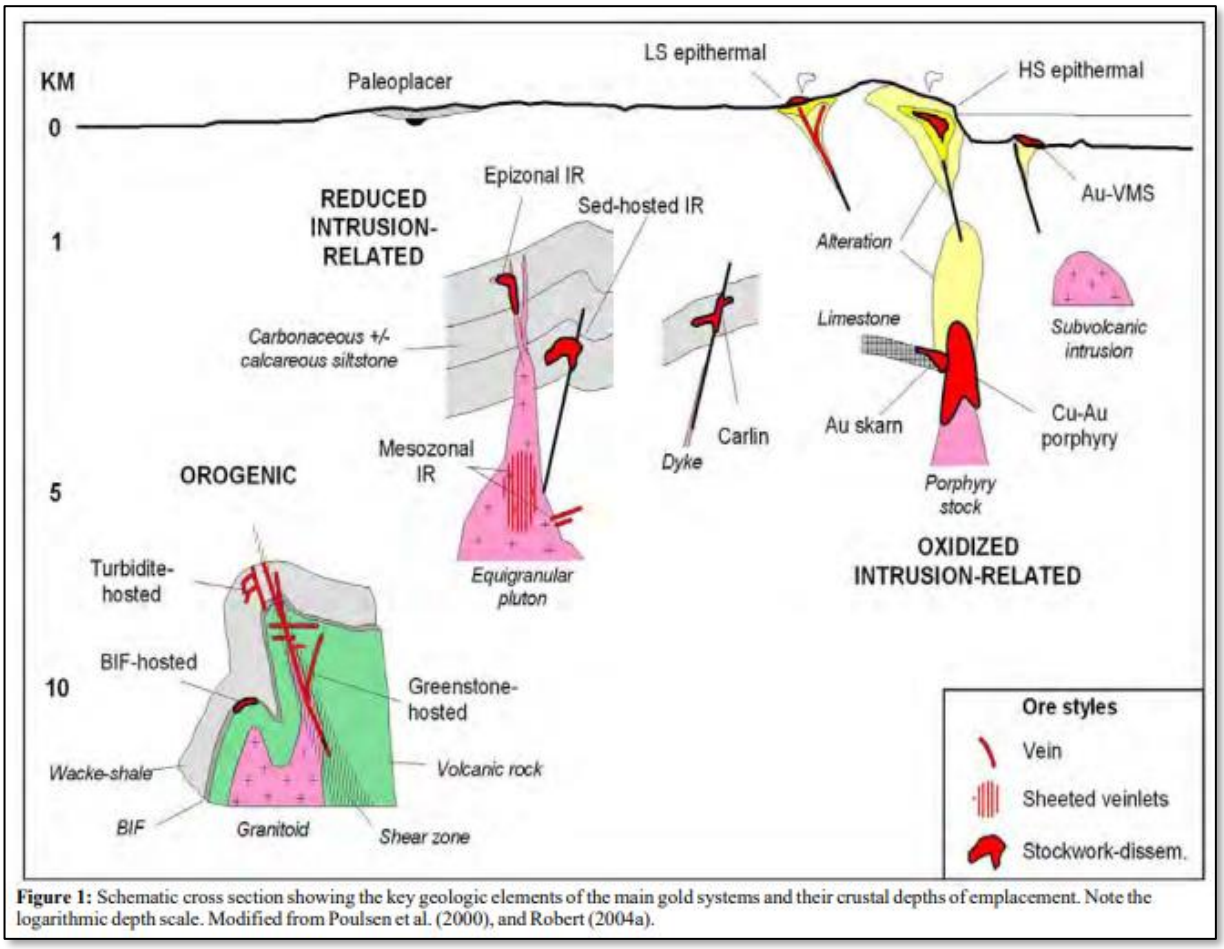


Figure 1: Schematic cross section showing the key geologic elements of the main gold systems and their crustal depths of emplacement. Note the logarithmic depth scale. Modified from Poulsen et al. (2000), and Robert (2004a).

Figure 38 Main gold systems

From Robert et al., 2007)

"The term orogenic is restricted to deposits composed of quartz-carbonate veins and associated wallrock replacement associated with compressional or transpressional geological structures such as reverse faults and folds, as depicted in the corresponding diagram of Figure 1. Three main types of orogenic deposits are distinguished based on their host-rock environment: greenstone-hosted, turbidite-hosted, and BIF-hosted types (Figure 1; Table 1). Atypical deposits encountered in greenstone belts are discussed separately. Orogenic deposits of all three types share a number of additional characteristics. They consist of variably complex arrays of quartz-carbonate vein that display significant vertical continuity, commonly in excess of 1 km, without any significant vertical zoning. The ores are enriched in Ag-As+/-W and have Au:Ag ratios >5. Other commonly enriched elements include B, Te, Bi, Mo. The dominant sulfide mineral is pyrite at greenschist grade and pyrrhotite at amphibolite grade. Arsenopyrite is the dominant sulfide in many clastic-

sediment-hosted ores at greenschist grade, and loellingite is also present at amphibolite grade. Orebodies are surrounded by zoned carbonate-sericite pyrite alteration haloes that are variably developed depending on host rock composition. At the regional scale, a majority of deposits are spatially associated with regional shear zones and occur in greenschist-grade rocks, consistent with the overall brittle-ductile nature of their host structures.

"Greenstone-hosted orogenic deposits are the most important of the clan and the best represented type among the >10 M oz deposits (Table 2), including Hollinger-McIntyre, Dome, Sigma, Lamaque, Victory-Defiance, Norseman, and Mt Charlotte. The quartz-carbonate veins in these deposits typically combine laminated veins in moderately to steeply dipping reverse shear zones with arrays of shallow-dipping extensional veins in adjacent competent and lower strain rocks (Figure 1). The reverse character of the shear-zone-hosted veins and shallow dips of extensional veins attest to their formation during crustal shortening (Sibson et al., 1988; Robert and Poulsen 2001). In greenstone belts, the significant vein deposits are typically distributed along specific regional compressional to transpressional structures. By virtue of their association with regional structures, these camps are also located at the boundaries between contrasted lithologic or age domains within the belts. Along these structures, the deposits commonly cluster in specific camps, localized at bends or major splay intersections, and where deposits typically occur in associated higher-order structures (Goldfarb et al. 2005; Robert et al., 2005). The larger camps and deposits are commonly spatially associated with late conglomeratic sequences as exemplified by the Timiskaming polymict conglomerates in the Abitibi greenstone belt and the Tarkwaian quartz pebble conglomerates in the Birimian Shield. The deposits occur in any type of supracrustal rocks within a greenstone belt and, covering stratigraphic positions from lower mafic-ultramafic volcanic to upper clastic sedimentary stratigraphic levels. However, large deposits tend to occur stratigraphically near the unconformity at the base of conglomeratic sequences, especially if developed above underlying mafic-ultramafic volcanic rocks (Robert et al., 2005)." (From Robert et al., 2007)

7.0 RESULTS

From 28th - 29th March, 2022, Precision GeoSurveys Inc. of Langley, B.C. flew a high-resolution helicopter-borne magnetic survey for Trillium Gold Mines Inc. over the Larder Lake property, which comprises two separate blocks, North and South.

The blocks were flown at 100 m line spacing at a heading of 000°/180°, tie lines were flown at 1000 m spacing at a heading of 090°/270°

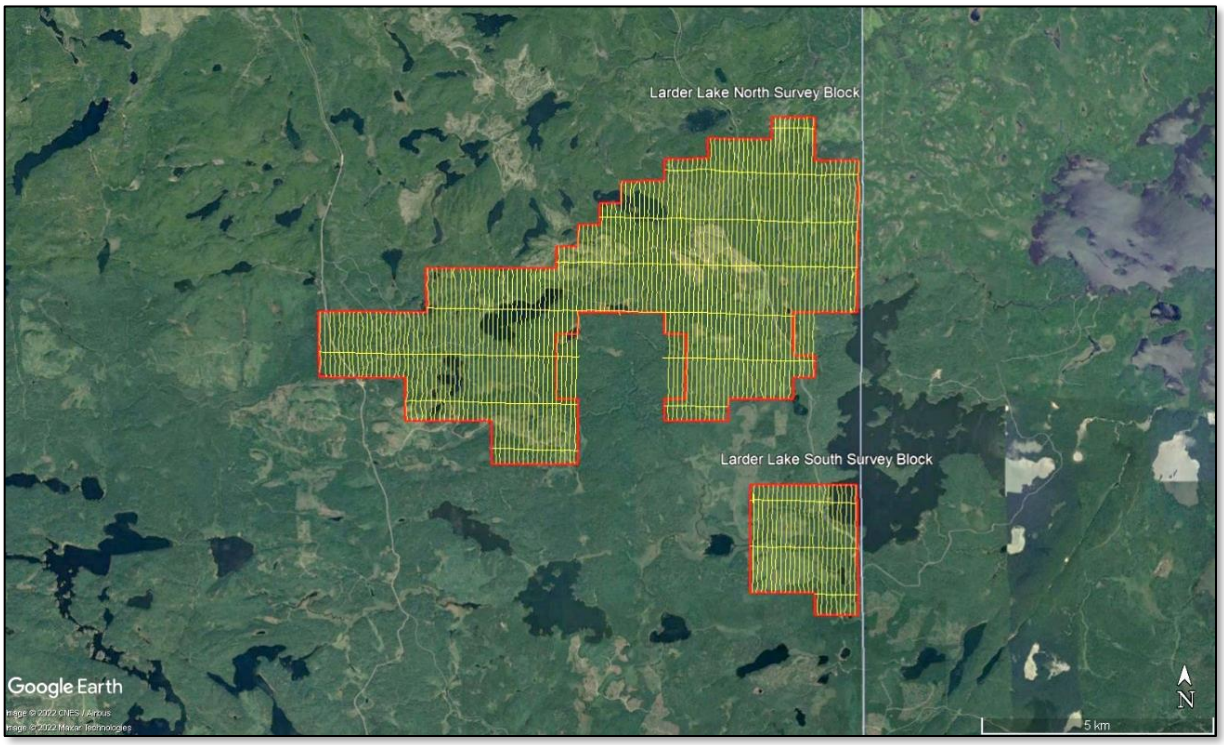


Figure 39 Plan view of survey blocks with flight lines

The property outlines are shown in red.

The geodetic system used for the geophysical survey was WGS 84, UTM Zone 17N. A total of 527-line km was flown over the two survey blocks with a total area of 46.2 km2 (Table 2). This total includes 22 km of data retained from partial flight lines flown outside the survey block margins for survey efficiencies for both survey blocks. Polygon coordinates for the Larder Lake survey blocks are specified in Appendix A. Flight lines are shown in yellow. Summary is provided, below.

Larder Lake Survey Block	Area (km^2)	Line Type	No. of Lines Planned	No. of Lines Completed	Line Spacing (m)	Line Orientation (UTM grid)	Total Planned Line km	Total Actual km Flown
North	40.4	Survey	116	116	100	000°/180°	403	423
		Tie	8	8	1000	090°/270°	40	41
		Total:	**124**	**124**			**443**	**464**
South	5.8	Survey	23	23	100	000°/180°	57	58
		Tie	3	3	1000	090°/270°	5	5
		Total:	**26**	**26**			**62**	**63**
Totals	**46.2**		**150**	**150**			**505**	**527**

Data presented in the Precision report is derived from a slung single sensor survey from which the horizontal and vertical gradients were calculated.

Specifics of the geophysical equipment and processing are provided in the accompanying report by Precision GeoSurveys Inc., author, J. Poon, B.Sc., P. Geo. This includes polygon co-ordinates for the survey block (in Appendix A, separate file). Survey jpegs are in the Appendix.

8.0 INTERPRETATION

The following observations are made:

Note, legends for respective figures are provided in the Appendix.

North Block

- A broad E-W trending stratigraphy with slight curvature into NE trends in the NE of the north block.
- Three broad magnetic signatures with overall E-W to ENE-WSW trend. The slight disparity in trend between this and the preceding note reflects later faulting.
- Comparing the regional geology and the magnetic results, there is little differentiation within and between intermediate and felsic volcanic dominated sequences.
- Arguably, a broad mafic to more felsic-dominated sequence from north to south.
- More extensive gabbroic to dioritic intrusions than shown on the government geology maps, especially in the NE of the property.
- At least one, perhaps two major Matachewan age diabase dykes trending through the NE of the property. The major NNW trending magnetic high in this area is a diabase co-incident with several large scale regional 'eskers'.
- A set of ENE-WSW trending lineaments across the property, cut by E-W to WNW-ESE trending lineaments. The ENE to NE trending Misema Lake-Mist lake fault (shown as one of the white dashed lines), appears to be also cut by the WNW-ESE set, and is partially obscured in the NE by diabase dykes and perhaps also the gabbro-diorite intrusions.
- Some of the weaker magnetic sequence in the south and east may be related to overburden depth.
- The NNW trending diabase/esker likely marks a large-scale fault, with to the east, higher uplifted terrain.

South Block

- Generally E-W striking stratigraphy, with three major lithological sequences, a relatively high, more mafic-intermediate volcanic terrain, a central. More intermediate sequence, and to the south a mafic, possibly intrusive sequence that could be Archæan or Nipissing Proterozoic in age, the latter correlating with Nipissing diabase and Huronian sediments seen to the south and SE.
- As with the North Block, WNW-ESE and ENE-WSW trending lineaments.

Images with geology are 'best-fit' as this data was not georeferenced.

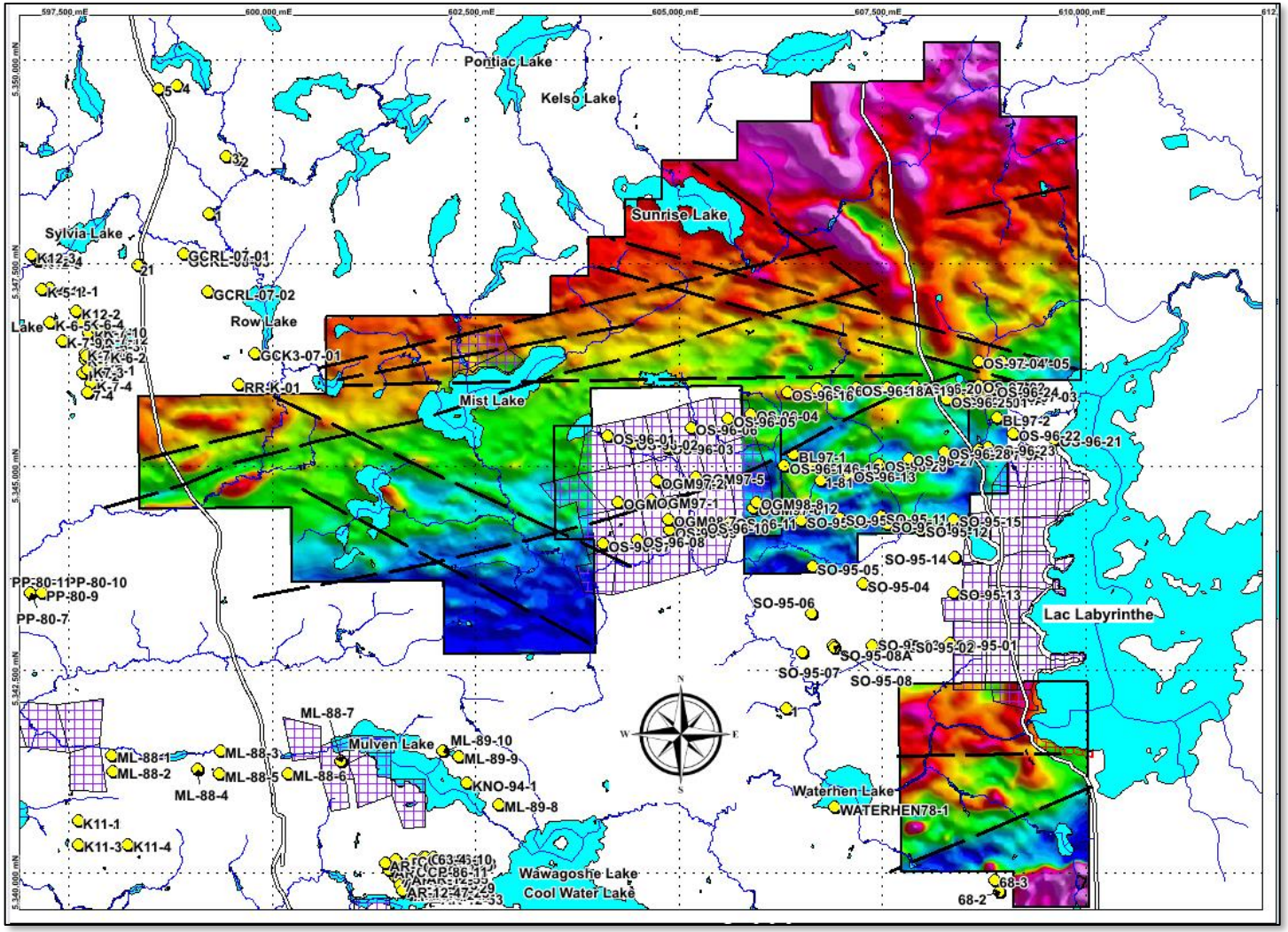


Figure 40 TMI data and historic drilling

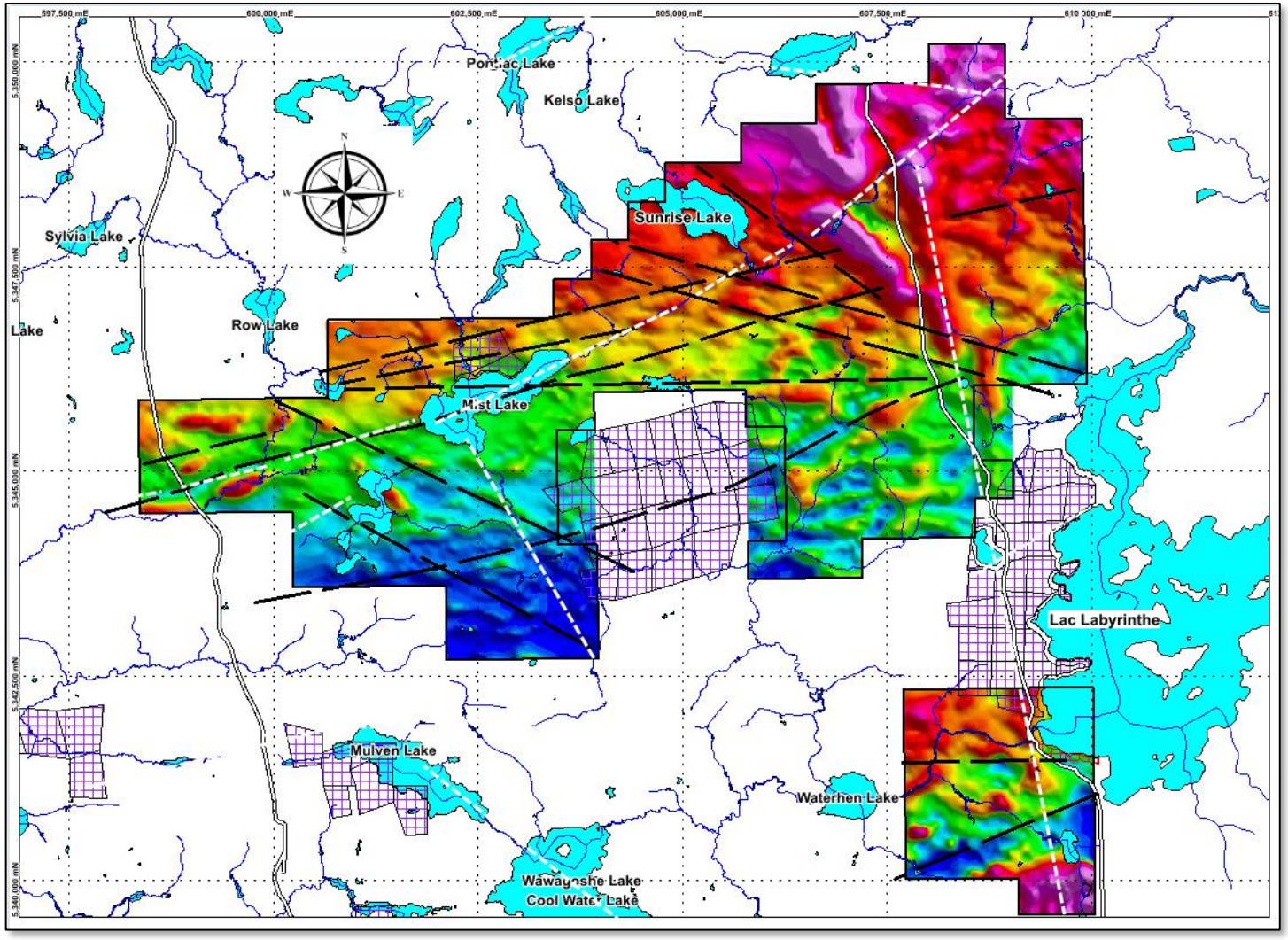


Figure 41 RTP data

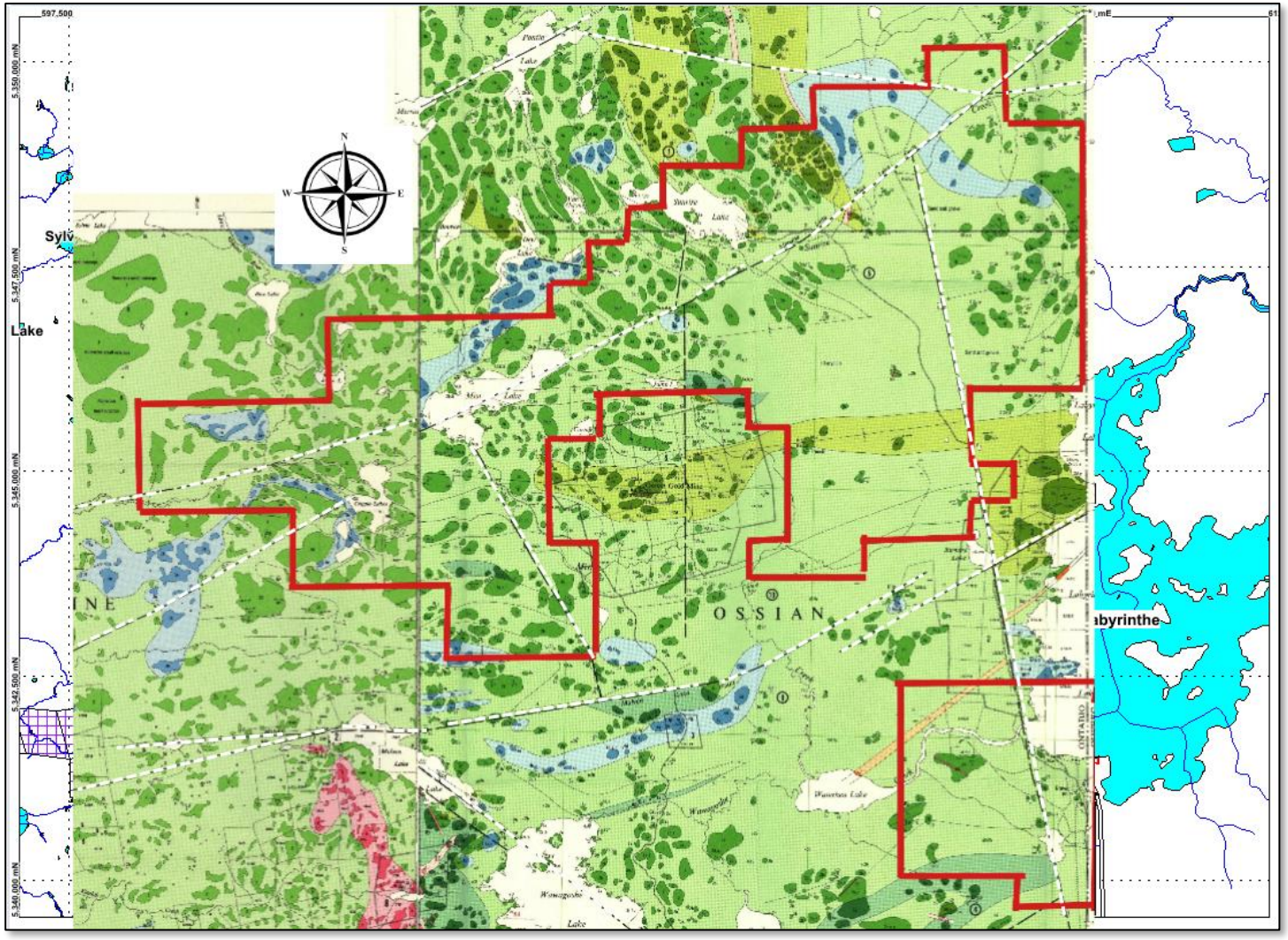


Figure 42 Property area geology

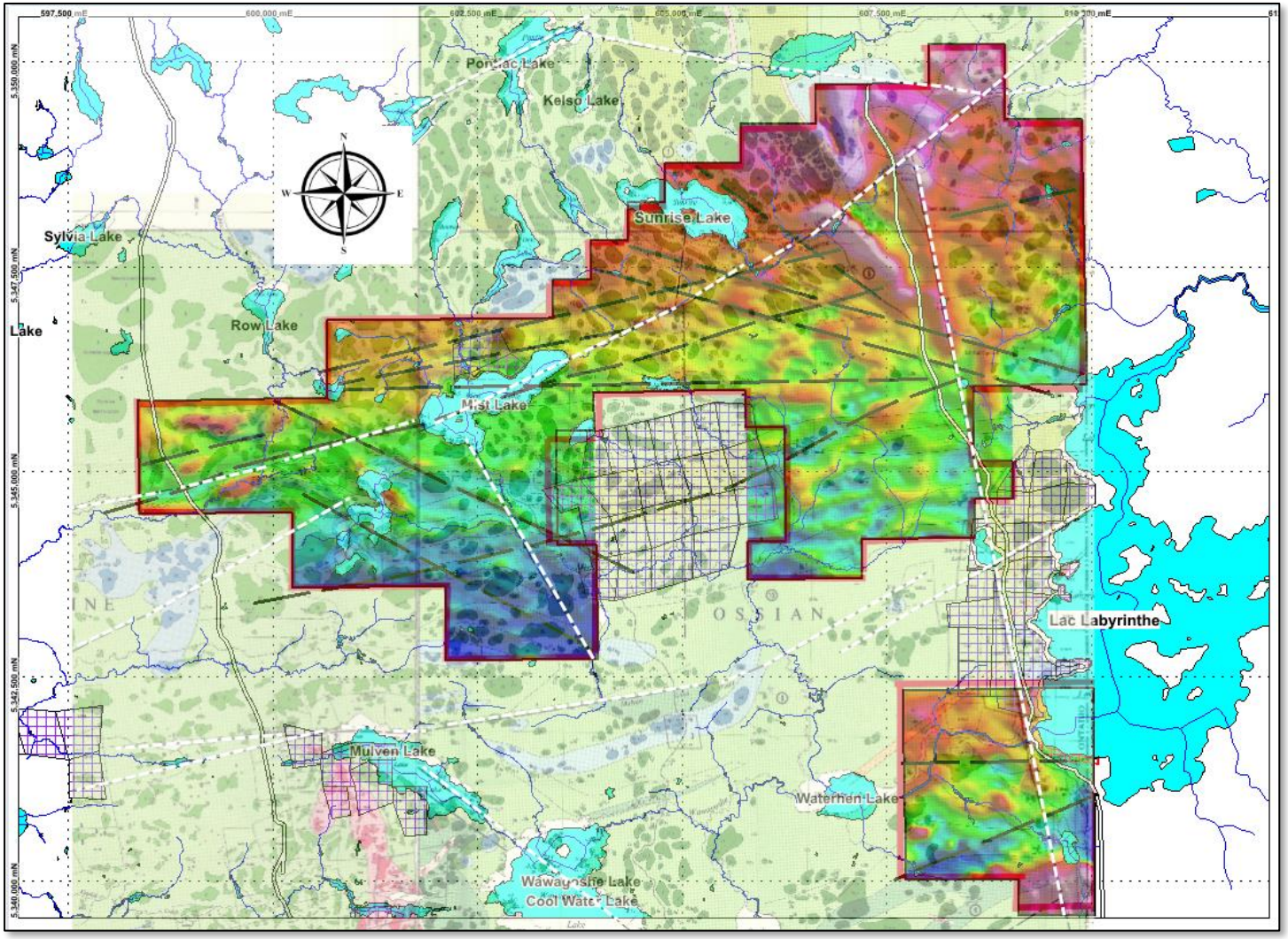


Figure 43 Transparency of TMI data overlaying geology

9.0 CONCLUSIONS

A large property, with no systematic mapping but localised detailed ground magnetic, MaxMin and IP surveys, the latter of some use for advancing work east of the Ossian patented claims.

There is are several geochemical (soil etc) sampling programmes indicating low but anomalous precious metal results, e.g., the east and west extensions of the Ossian GM showing, and along the Misema-Mist lakes fault.

Humus and till sampling and by extension, soil/MMI/SGH are options for the entire property, as historic surveys suggest these are suitable options for the terrain/surficial geology.

Regarding the Agnico-Eagle till sampling, their presumed northern lineament and alteration zone can be traced almost in a straight line into Ontario and through the Culhane- and -2 mineralised areas, and with a 10-15^{o} deflection north, over to the Culhane Showing by Sunrise Lake. In Ontario, this would be the Misema Lake - Mist Lake Fault. Such a fault has parallel features, including the Kirkland Lake Fault to the west. Both could represent P shears.

Sutherland's work and re-interpretation of mineralisation on the Ossian GML property concluded the main trends and likely structural controls were N-S rather than E-W. The latest magnetic survey indicates no such major structures, but a detailed ground magnetic survey could yield subtle features

There is a clear demand for the stratigraphy to be defined and together with a detailed magnetic survey, this would go a long way to providing a much-needed base map.

The extent and potential of the diorite-gabbro intrusions in the north of the property is much larger, though one or two maybe later diabase dykes. Historically, the more ultramafic, be they komatiitic or peridotitic would be targeted for nickel only.

Work on the Boudreault-Labbé property, now largely covered by the centre-east main block has several IP responses that remain untested.

The ?-two major structures controlling or delimiting the Russian Kid gold mineralisation likely extend into Ontario, with only the 'diorite' component tapering off. The majority of modern (<20 years) exploration on and around Russian Kid focussed on targets outside of the diorite, with positive results. The structures are E-W to ENE-WSW trending and represent a continuation of the Mulven Lake fault, a probable P shear which trends between the two TGM blocks. The OGS geology and regional geophysics indicates the Misema Lake-Mist Lake fault trends through the main TGM block, with potentially parallel faults to the north as similar strength targets.

The Montbray fault zone's extension into Ontario as the Misema Lake – Mist Lake fault host what A-E described as gold-bearing N-S trending structures (cf Sutherland's comments on Ossian mineralisation). These could represent R_1 shears, with mineralisation similar to that at Ossian GM if some authors are to be believed.

RC drilling appears to have been quite successful in terms of gold grains discovered though much of the drilling was on or adjacent to the eastern esker complex. Grain investigations concluded some of the grains may have a proximal source based on shape, though many were clearly re-worked with gold found in re-worked and basal till material. Overall, the source for many remains unknown. Large mechanised drilling is somewhat hampered by lack of access roads, swamp and in this area of the property, topography.

From interpretation of the Trillium airborne survey:

Possibly three broad, largely volcanic sequences, distinguished by gross differences in magnetic signature.

Scatted magnetic highs with limited strike length may represent small more mafic volcanic sequences in intermediate-mafic, felsic volcanic dominant sequences, or thin iron formations.

Larger, longer, broader magnetic highs are related to gabbro or diabase. This includes several Matachewan age diabase dykes.

The Misema fault – Mist Lake fault appears as a weak lineament cut by WNW-ESE faulting. It may represent a splay off the regional Cadillac-Larder Lake fault.

10.0 RECOMMENDATIONS

- A high resolution airborne magnetic gradiometer survey.
- Selected traverses for lithogeochemical sampling and age-dating to locate potential stratigraphic breaks that may relate to a volcanic hiatus and (mineralised) volcanic resurgence.
- Review of the IP surveys by Silver Century, 2420-2970 Quebec Inc./Belanger as they cover a potentially significant NE-SW structural trend that could represent the western extension of the Montbray fault or a south-parallel structure. Weak gold grades from Agnico drilling suggest it has some potential within a four km long tuff belt, a portion of which would trend through the northern part of the North block.
- Review the results of the RC drilling by Silver Century/Sudbury Contact Mines and tie into the northern IP survey work and 'anomalies' where applicable. Several were diamond drill tested with negative results but others remain untested.
- Review the association of Au-VMS deposits in Quebec with syn-volcanic faults.
- Contract an experienced volcanologist to assist with volcanic facies identification and potential volcanic hiatuses representing possible changes in regional volcanic activity and by extension, the onset of (mineralised) volcanism and hydrothermal activity. This would in part test and expand on the Blake River Assemblage megacaldera model.
- Give some thought to age dating to determine if there are any significant breaks in stratigraphy. This would be an extension of the volcanological work.
- Lithogeochemical sampling, with a focus on carbonate alteration and its relative age (syn- or post-volcanic), chlorite and identification of any silicification rather than felsic volcanic bodies.

Respectfully Submitted,

T.N.J. Hughes, P. Geo.

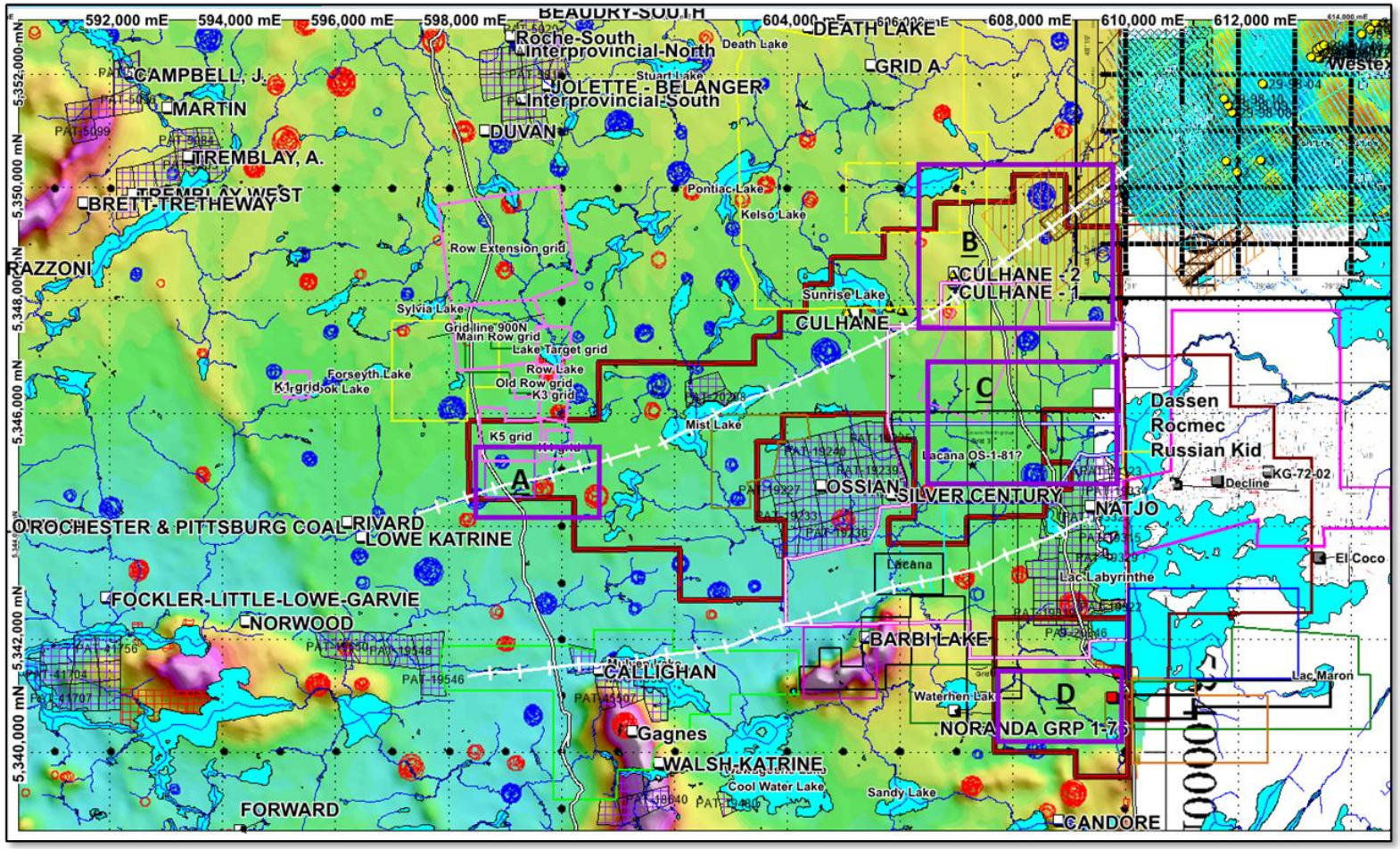


Figure 44 Main target areas

Main target areas for ground work are outlined in purple. A = a portion of the Misema-Mist lakes fault; B = NE portion of the same fault, which covers the work by Agnico-Eagle in PQ and ON: C = a possible parallel structure trending west from the northern flank of the Russian Kid deposit and diorite sill: D = possible extension of a weak discontinuity and associated unconformity discovered by Aur, Corp. Falconbridge

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12.0 STATEMENT OF QUALIFICATIONS

I, Toby Hughes of Vancouver, B.C. declare that:

- I graduated with an Hons. B.Sc. Geology, from Dundee University, Scotland, in 1980

- I have worked as an exploration geologist for 41 years since graduation.

- I am a Practicing Geologist in good standing with Professional Geoscientists Ontario, No. 1318

T. Hughes, P. Geo.



Dated this day, 8.11.22

APPENDIX I - **Precision Geoscience Logistics report, Larder Lake Property**

Precision GeoSurveys

AIRBORNE GEOPHYSICAL SURVEY REPORT



Larder Lake Survey Blocks

Kirkland Lake, Ontario

Trillium Gold Mines Inc.

Precision GeoSurveys Inc.

BC Permit to Practice 1002615

www.precisiongeosurveys.com

Hangar 42, Langley Airport

21330 - 56th Ave., Langley, BC

Canada V2Y 0E5

604-484-9402

Jenny Poon, B.Sc., P.Geo.

March 2022

Job# 22101

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1.0 Introduction

This report outlines the geophysical survey operations and data processing procedures taken during the high resolution helicopter-borne magnetic survey flown over the Larder Lake project for Trillium Gold Mines Inc. The Larder Lake project is located in eastern Ontario (Figure 1), adjacent to the Ontario-Quebec border. The survey was flown on March 28 and March 29, 2022.



Figure 1: Larder Lake survey area located in eastern Ontario.

1.1 Survey Area

The Larder Lake survey is composed of two blocks, North and South. The survey is centered approximately 38 km northeast of Kirkland Lake, Ontario (Figure 2).

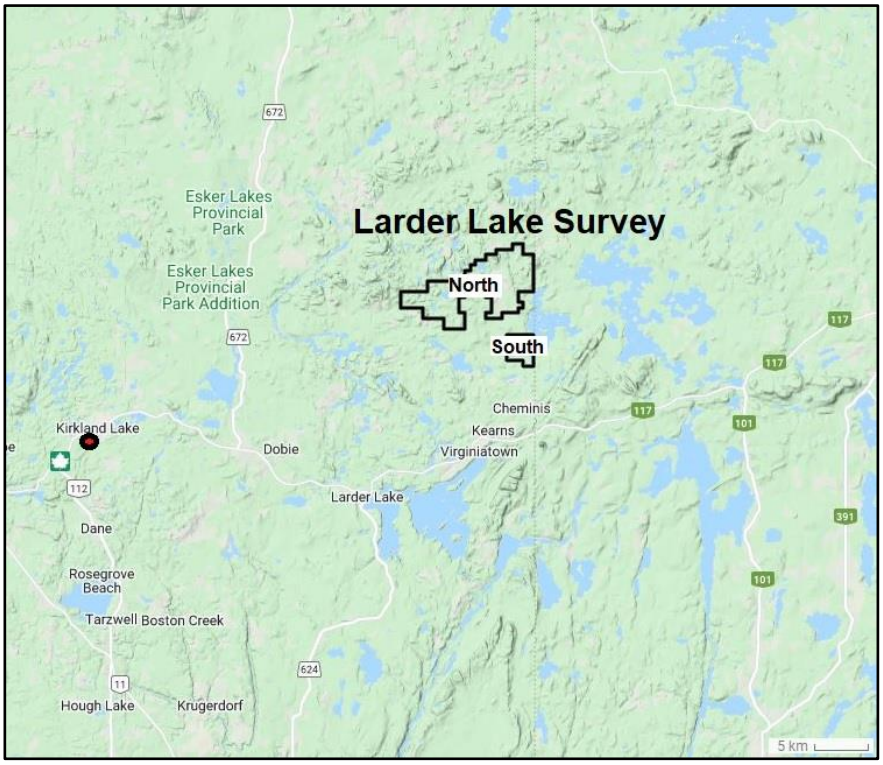


Figure 2: Larder Lake North and South survey blocks northeast of Kirkland Lake, Ontario.

The Larder Lake survey blocks were flown at 100 m line spacing at a heading of 000°/180°; tie lines were flown at 1000 m spacing at a heading of 090°/270° (Figures 3 and 4).

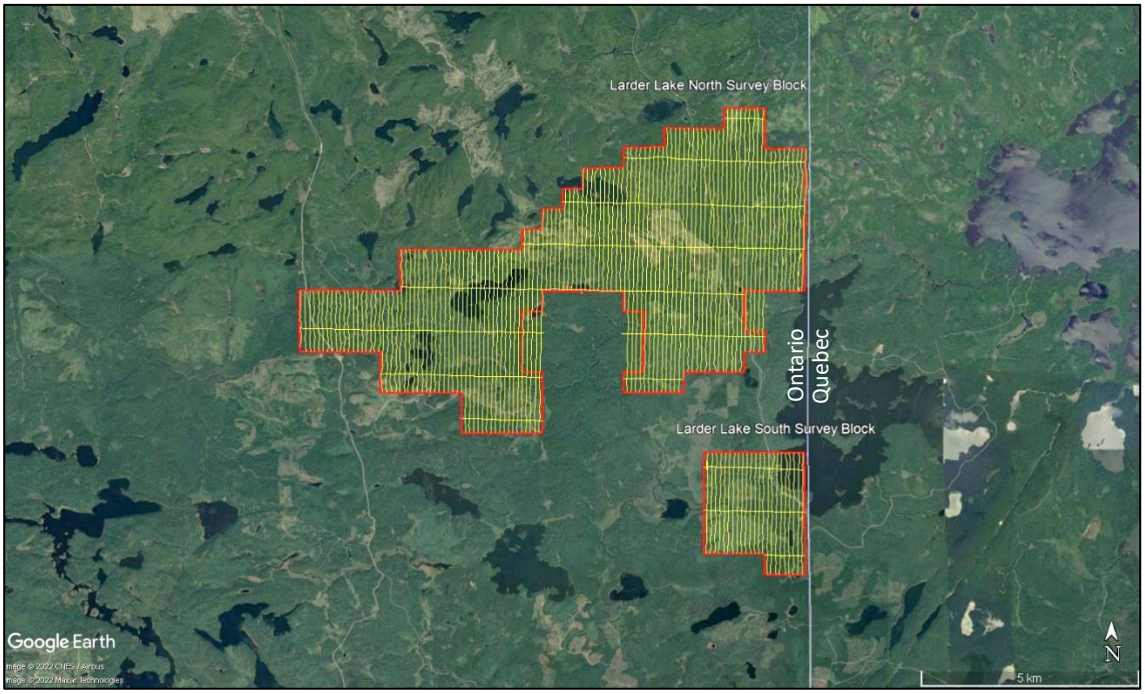


Figure 3: Plan View – Larder Lake North and South survey blocks with actual flight lines in yellow and the survey block boundary in red.

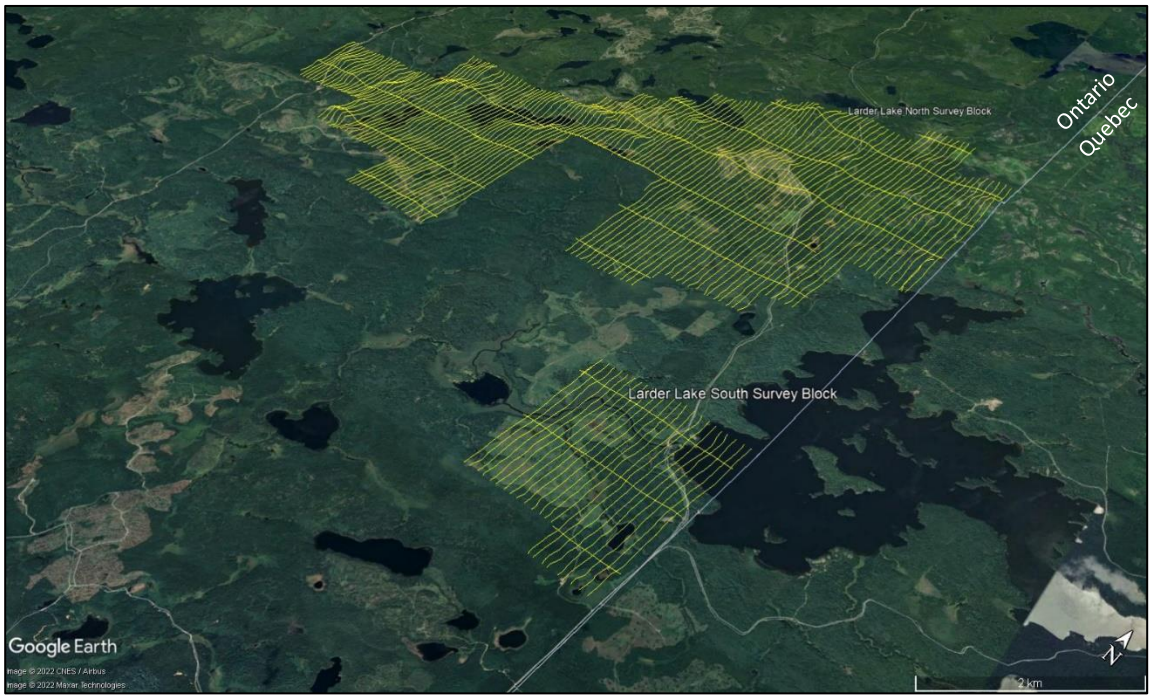


Figure 4: Terrain View – Larder Lake North and South survey blocks with actual flight lines in yellow.

1.2 Survey Specifications

The geodetic system used for the geophysical survey was WGS 84 in UTM Zone 17N. A total of 527 line km was flown over the two survey blocks with a total area of 46.2 km^2 (Table 1). This total includes 22 km of data retained from partial flight lines flown outside the survey block margins for survey efficiencies for both survey blocks. Polygon coordinates for the Larder Lake survey blocks are specified in Appendix A.

Larder Lake Survey Block	Area (km^2)	Line Type	No. of Lines Planned	No. of Lines Completed	Line Spacing (m)	Line Orientation (UTM grid)	Total Planned Line km	Total Actual km Flown
North	40.4	Survey	116	116	100	000°/180°	403	423
		Tie	8	8	1000	090°/270°	40	41
		Total:	**124**	**124**			**443**	**464**
South	5.8	Survey	23	23	100	000°/180°	57	58
		Tie	3	3	1000	090°/270°	5	5
		Total:	**26**	**26**			**62**	**63**
Totals	**46.2**		**150**	**150**			**505**	**527**

Table 1: Survey flight line specifications for Larder Lake North and South survey blocks.

2.0 Geophysical Data

Geophysical data are collected in a variety of ways and are used for many purposes including aiding in geological mapping, mineral exploration, oil and gas exploration, geotechnical investigations, contaminated land site studies, and UXO (unexploded ordnance) detection.

For the purposes of this survey, airborne magnetic data were collected to serve in geological mapping and exploration for mineral deposits.

2.1 Magnetic Data

Magnetic surveying is the most common airborne geophysical technology used for both mineral and hydrocarbon exploration. Aeromagnetic surveys measure and record the total intensity of the magnetic field at the magnetometer sensor, which is a combination of the desired geomagnetic field as well as influences from the constantly varying solar wind and the aircraft's magnetic field. By subtracting temporal and aircraft magnetic effects, the resulting aeromagnetic maps show the spatial distribution and relative abundance of magnetic minerals - most commonly the iron oxide mineral magnetite - in the upper levels of Earth's crust, which in turn are related to lithology, structure, and alteration of bedrock. Survey specifications, instrumentation, and interpretation procedures depend on the objectives of the survey. Magnetic surveys are typically performed for:

- Geological Mapping - to aid in mapping lithology, structure, and alteration.
- Depth to Basement Mapping - for exploration in sedimentary basins or mineralization associated with the basement surface.

3.0 Aircraft and Equipment

All geophysical and subsidiary equipment were carefully installed on an aircraft by Precision GeoSurveys to collect high resolution magnetic data.

3.1 Aircraft

Precision GeoSurveys flew the survey using an Airbus AS350 helicopter, registration C-FQCK.

3.2 Geophysical Equipment

The survey aircraft (Figure 5) was equipped with a data acquisition system, GPS navigation systems, pilot guidance unit (PGU), laser altimeter, fluxgate magnetometer, and a slung bird-type magnetic system. In addition, two magnetic base stations were used to record temporal magnetic variations. Technical specifications for the geophysical equipment are provided in Appendix B.

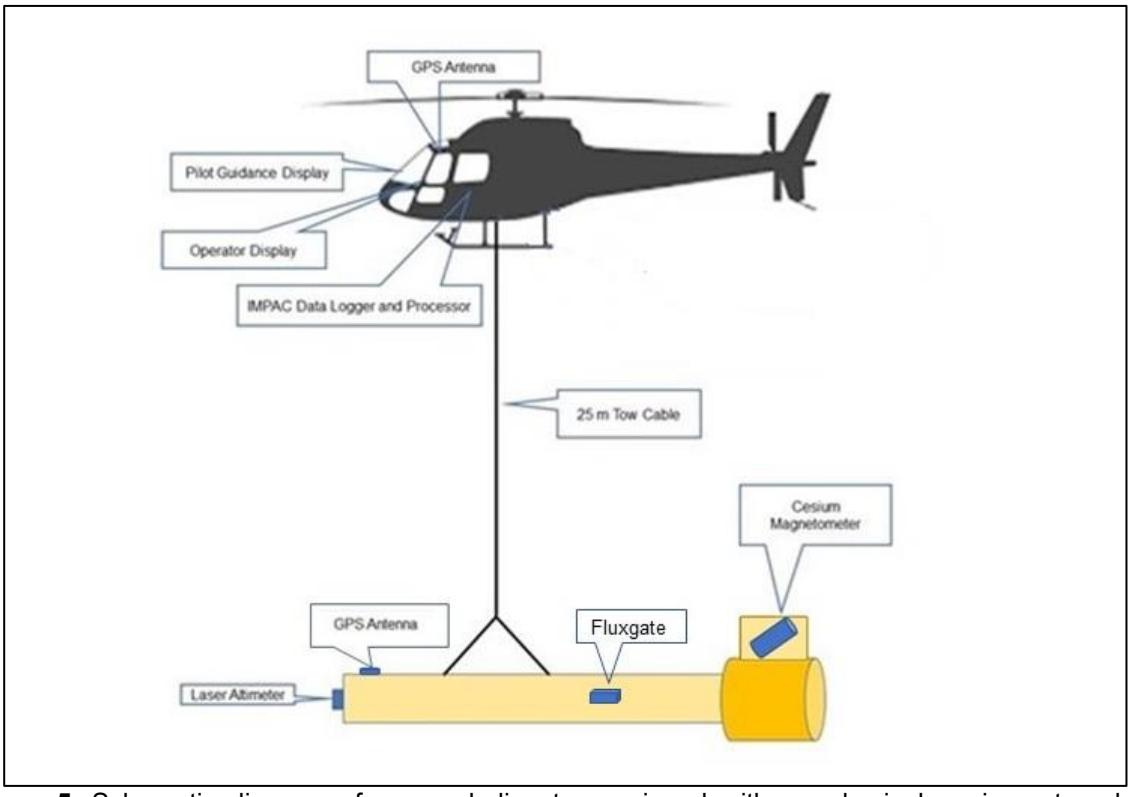


Figure 5: Schematic diagram of survey helicopter equipped with geophysical equipment and the magnetometer flown in a bird-type configuration slung 25 m below the helicopter. Not to scale.

3.2.1 IMPAC

The Integrated Multi-Parameter Acquisition Console (IMPAC) (Figure 6), manufactured by Nuvia Dynamics Inc. (previously Pico Envirotec Inc.), is the main computer used in integrated data recording, data synchronizing, providing real-time quality control data for the geophysical operator display, and the generation of navigation information for the pilot and operator display systems.



Figure 6: IMPAC data acquisition system.

Nuvia's Airborne Geophysical Information System (AGIS) software operates on Microsoft Windows. Depending on survey specifications, information such as magnetic field, electromagnetic response, total gamma count, counts of various radioelements (K, U, Th, etc.), cosmic radiation, barometric pressure, atmospheric humidity, temperature, aircraft attitude, navigation parameters, and GPS status can all be monitored on the AGIS on-board display (Figure 7).

While in flight, raw magnetic response, magnetic fourth difference, compensated and uncompensated data, radiometric spectra, aircraft position, survey altitude, cross track error, and other parameters are recorded (depending on sensor configuration) and can be viewed by the geophysical operator for immediate QC (quality control). Additional software allows for post or real time magnetic compensation.

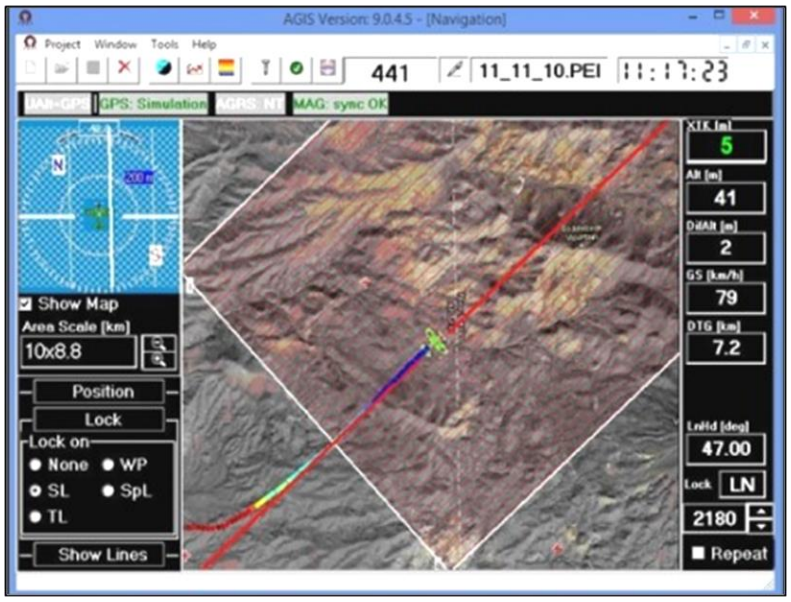


Figure 7: AGIS operator display showing real time flight line recording and navigation parameters. Additional windows display real-time geophysical data to operator.

3.2.2 GPS Navigation System

A Hemisphere R120 GPS receiver (Figure 8) and a Novatel GPS antenna on the tail of the aircraft are integrated with the AGIS navigation system and pilot display (PGU) to provide accurate navigational information and position control. A Hemisphere R330 GPS receiver (Figure 11) located in the helicopter connected to a second Novatel GPS antenna located on the magnetic bird airframe provides accurate position data for the bird independent of pilot navigation. The R120 and R330 GPS receivers support fast updates at a rate of up to 20 Hz (20 times per second); delivering sub-meter positioning accuracy in three dimensions. It receives GNSS (GPS/GLONASS), L1, and L2 signals.

The receiver supports differential correction methods including L-Band, RTK, SBAS, and Beacon. They employ innovative Hemisphere GPS Eclipse SureTrack technology, which allows it to model the phase on satellites that the airborne unit is currently tracking. With SureTrack technology, dropouts are reduced and speed of the signal reacquisitions is increased; enhancing accurate positioning when base corrections are not available.



Figure 8: Hemisphere R330 GPS receiver.

3.2.3 Pilot Guidance Unit

Steering and elevation (ground clearance) information is continuously provided to the pilot by the Pilot Guidance Unit (PGU). The graphical display is mounted on top of the aircraft's instrument panel, remotely from the data acquisition system. The PGU is the primary navigation aid (Figure 9) to assist the pilot in keeping the aircraft on the planned flight path, heading, speed, and the desired ground clearance.

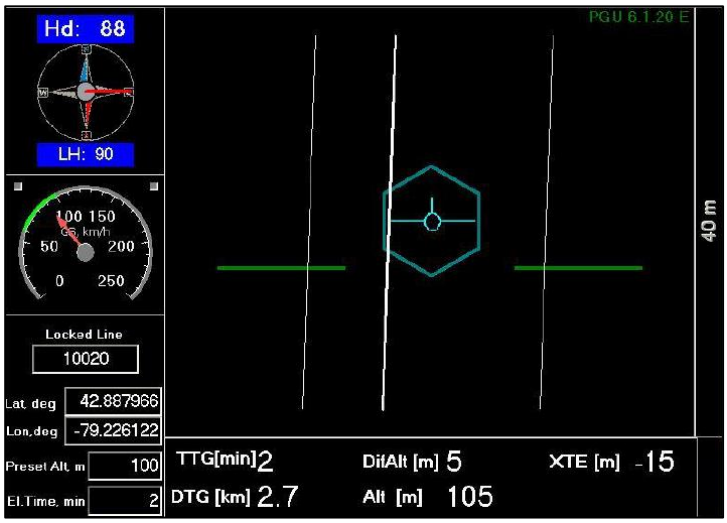


Figure 9: PGU screen displaying navigation information.

PGU information is displayed on a full VGA 600 x 800 pixel 7 inch (17.8 cm) LCD display. The CPU for the PGU is contained in a PC-104 console and uses Microsoft Windows operating system control, with input from the GPS antenna on the aircraft, laser altimeter, and AGIS.

3.2.4 Laser Altimeter

Terrain clearance is measured by an Opti-Logic RS800 Rangefinder laser altimeter (Figure 10) attached to the aft end of the magnetic bird airframe. The RS800 laser 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 700 m off natural surfaces with accuracy of ±1 m on a 1 x 1 m diffuse target with 50% (±20%) reflectivity. Within the sensor unit, reflected signal light is collected by the lens and focused onto a photodiode. Through serial communications and digital outputs, ground clearance data are transmitted to an RS-232 compatible port and recorded and displayed by the AGIS and PGU at 10 Hz in meters.

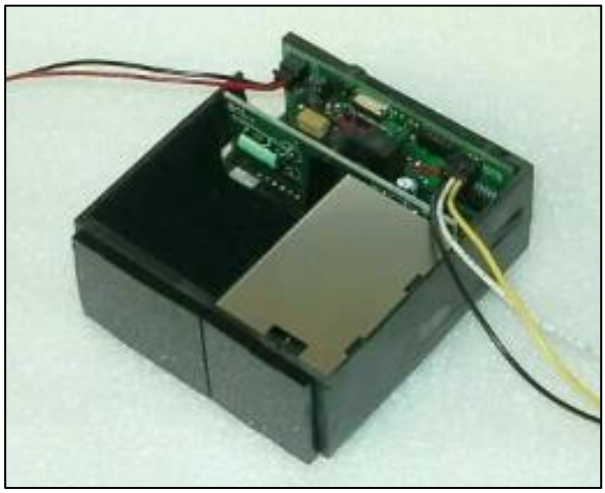


Figure 10: Opti-Logic RS800 Rangefinder laser altimeter.

3.2.5 Fluxgate Magnetometer

As the survey bird travels along a survey line, small attitude changes (pitch, roll, and yaw) are measured by a triaxial fluxgate magnetometer (Figure 11). The fluxgate consists of three magnetic sensors, X, Y, and Z, operating independently and simultaneously. Each sensor has an analog output corresponding to the directional component of the ambient magnetic field along its axis. Response of the sensors is proportional to the cosine of the angle between the applied field and the sensor's sensitive axis.



Figure 11: Billingsley TFM100G2 triaxial fluxgate magnetometer.

3.2.6 Magnetometer

The survey was flown with a Scintrex CS-3 split-beam cesium vapor magnetometer (Figure 12) flown 25 m below the helicopter to remove aircraft magnetic effects. The magnetometer was oriented at 45 degrees with respect to the horizontal to couple with local magnetic field at the Larder Lake survey area.



Figure 12: CS-3 cesium vapor magnetometer.

3.2.7 Magnetic Base Station

Temporal variations of Earth's magnetic field, particularly diurnal, were monitored and recorded by two GEM GSM-19T base station magnetometers. They were operated at all times while airborne data were being collected. The base stations were located in an area with low magnetic gradient, away from electric power transmission lines and moving ferrous objects, such as motor vehicles, that could affect the survey data integrity.

The GEM GSM-19T magnetometer (Figure 13) with integrated GPS time synchronization uses proton precession technology with absolute accuracy of ±0.20 nT and sensitivity of 0.15 nT at 1 Hz. Base station magnetic data were recorded on internal solid-state memory and downloaded onto a field laptop computer using a serial cable and GEMLink 5.4 software. Profile plots of the base station readings were generated, updated, and reviewed at the end of each survey day.



Figure 13: GEM GSM-19T proton precession magnetometer.

4.0 Survey Operations

The survey was flown on March 28 and March 29, 2022, in winter conditions. Some delays were experienced due to equipment maintenance and poor weather; freezing rain, snow, and high winds. The experience of the pilot ensured that data quality objectives were met, and that safety of the flight crew was never compromised given the potential risks involved in airborne geophysical surveying. Field processing and quality control checks were performed daily.

4.1 Operations Base and Crew

The base of operation for the Larder Lake survey was at Kirkland Lake airport (YKX), Ontario, approximately 32 km west of the survey blocks.

Precision's geophysical crew consisted of four members (Table 2):

Crew Member	Position
Greg Heuring	Helicopter survey pilot
Bruce Larsen	Geophysical operator
Shawn Walker, M.Sc., P.Geo.	Geophysicist – data processor and mapping (off-site)
Jenny Poon. B.Sc., P.Geo.	Geophysicist – data processor and reporting (off-site)

Table 2: List of survey crew members.

4.2 Magnetic Base Station Specifications

Changes in the Earth's magnetic field over time, such as diurnal variations, magnetic pulsations, and geomagnetic storms, were measured and recorded by two stationary GEM GSM-19T proton precession magnetometers. The magnetic base stations were installed at Kirkland Lake airport (Table 3; Figures 14 and 15) away from sources of potential magnetic interference such as ferromagnetic objects, vehicles, and power lines that could affect the base stations and ultimately the survey data.

Station Name	Easting/Northing	Latitude/Longitude	Datum/Projection
GEM 2 S/N 2065369	575266 m E 5339825 m N	48° 12' 25.88" N 79° 59' 12.98" W	WGS 84, Zone 17N
GEM 3 S/N 5081669	575252 m E 5339819 m N	48° 12' 25.70" N 79° 59' 13.67" W	WGS 84, Zone 17N

Table 3: Magnetic base station locations.

Magnetic readings were reviewed at regular intervals to ensure that no airborne data were collected during periods of high magnetic activity (in excess of 10 nT from a linear chord of five minutes length).

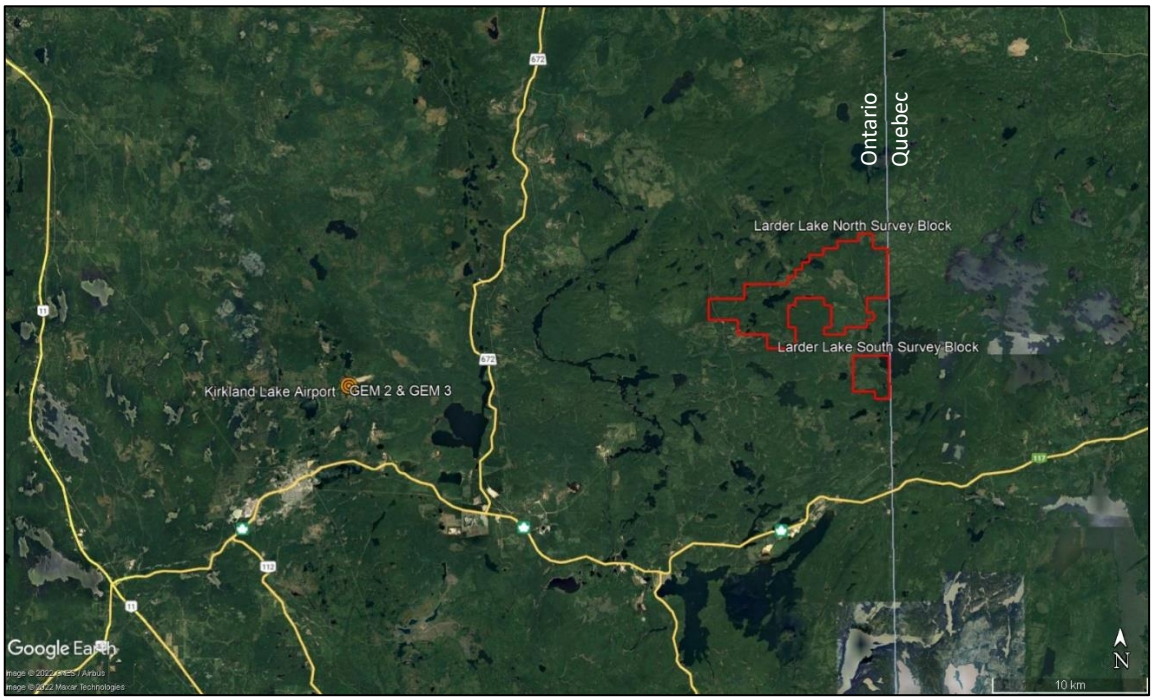


Figure 14: GEM 2 and GEM 3 magnetic base stations located at Kirkland Lake airport.



Figure 15: GEM 2 (left) and GEM 3 (right) magnetic base stations

4.3 Field Processing and Quality Control

Survey data were transferred from the aircraft's data acquisition system to a USB memory stick and copied onto a field data processing laptop on a flight by flight basis. The raw data files in PEI binary data format were converted into Geosoft GDB database format. Using Geosoft Oasis Montaj 2021.2.1.11, the data were inspected to ensure compliance with contract specifications (Table 4; Figures 16 to 18).

Parameter	Specification	Tolerance
Position	Line Spacing	Flight line deviation within 10 m L/R from ideal flight path. No exceedance for more than 1 km.
	Height	Nominal flight height of 40 m above ground level (AGL) with tolerance of ±20 m. No exceedance for more than 1 km, provided deviation is not due to tall trees, topography, mitigation of wildlife/livestock harassment, cultural features, or other obstacles beyond the pilot's control.
	GPS	GPS signals from four or more satellites must be received at all times, except where signal loss is due to topography. No exceedance for more than 1 km.
Magnetics	Temporal/Diurnal Variations	Non-linear temporal magnetic variations within 10 nT of a linear chord of 5 minutes length.
	Normalized 4th Difference	Magnetic data within 0.01 nT peak to peak. No exceedance for distances greater than 1 km or more, provided noise is not due to geological or cultural features.

Table 4: Contract survey specifications.

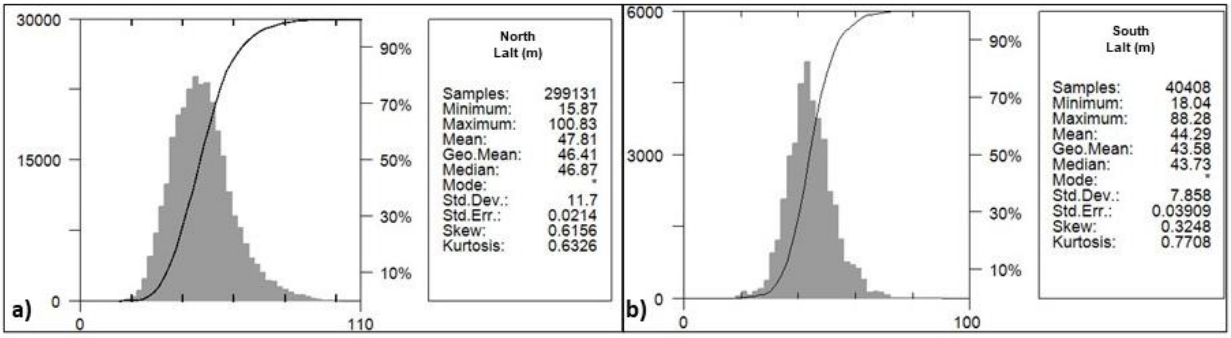


Figure 16: Histogram showing survey bird elevation vertically above ground.as measured by laser altimeter. a) North block b) South block.

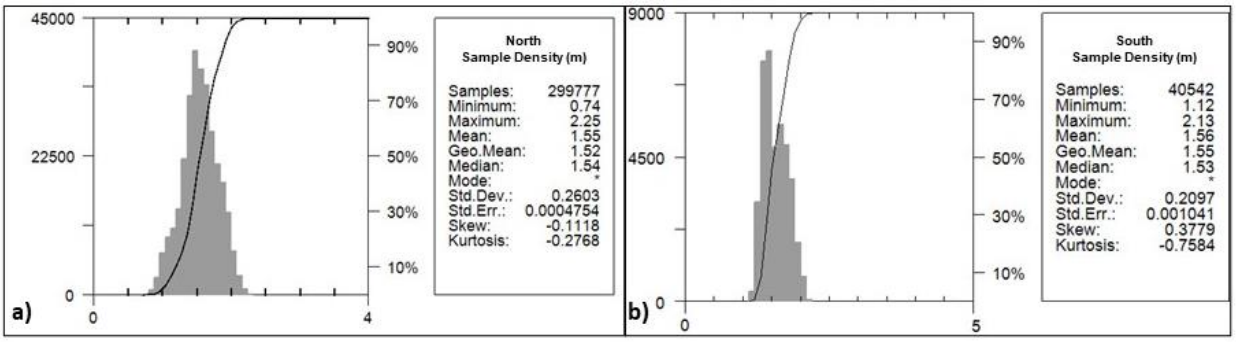


Figure 17: Histogram showing magnetic sample density. Horizontal distance in meters between adjacent in-line measurement locations; magnetic sample frequency 20 Hz. a) North block b) South block.

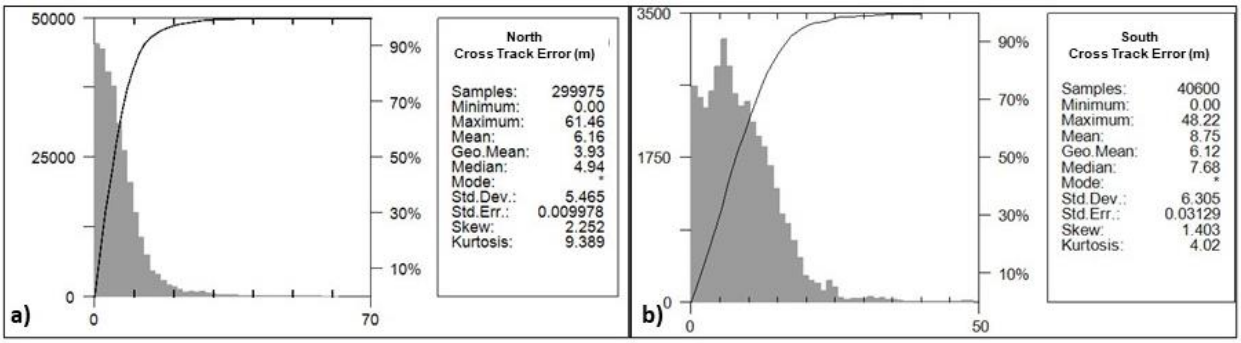


Figure 18: Histogram showing cross track error of survey bird. a) North block b) South block.

5.0 Data Acquisition Equipment Checks

Equipment tests and calibrations were conducted for the laser altimeter and magnetometer at the start of the survey to ensure compliance with contract specifications and to deliver high quality airborne geophysical data. A lag test was conducted for both sensors.

5.1 Laser Altimeter Calibration

The Opti-Logic RS800 laser altimeter used on the survey helicopter was tested and calibrated in accordance with manufacturer's instructions prior to starting the survey. This ensured that heights reported by the laser were accurate within the normal survey operating range.

5.2 Lag Test

A lag test was performed to determine the difference in time the digital reading was recorded for the magnetometer and laser altimeter with the position fix time that the fiducial reading was obtained by the GPS system resulting from a combination of system lag and different locations of the various sensors and the GPS antenna. The test was flown in reciprocal headings over identifiable features at survey speed and height to isolate position changes. The resulting data (Table 5) were used to correct for time and position.

Instrument	Source	Lag Fiducial	Correction (sec)
Magnetometer	Logging machinery	4	0.20
Laser	Sharp gully	12	0.60

Table 5: Survey lag correction values. Laser altimeter resampled to 20 Hz.

6.0 Data Processing

After all data were collected, several procedures were undertaken to ensure that the data met a high standard of quality. All magnetic data recorded by the AGIS were converted into Geosoft or ASCII file formats using Nuvia Dynamics software. Further processing (Figure 19) was carried out using Geosoft Oasis Montaj 2021.2.1.11 geophysical processing software along with proprietary processing algorithms.

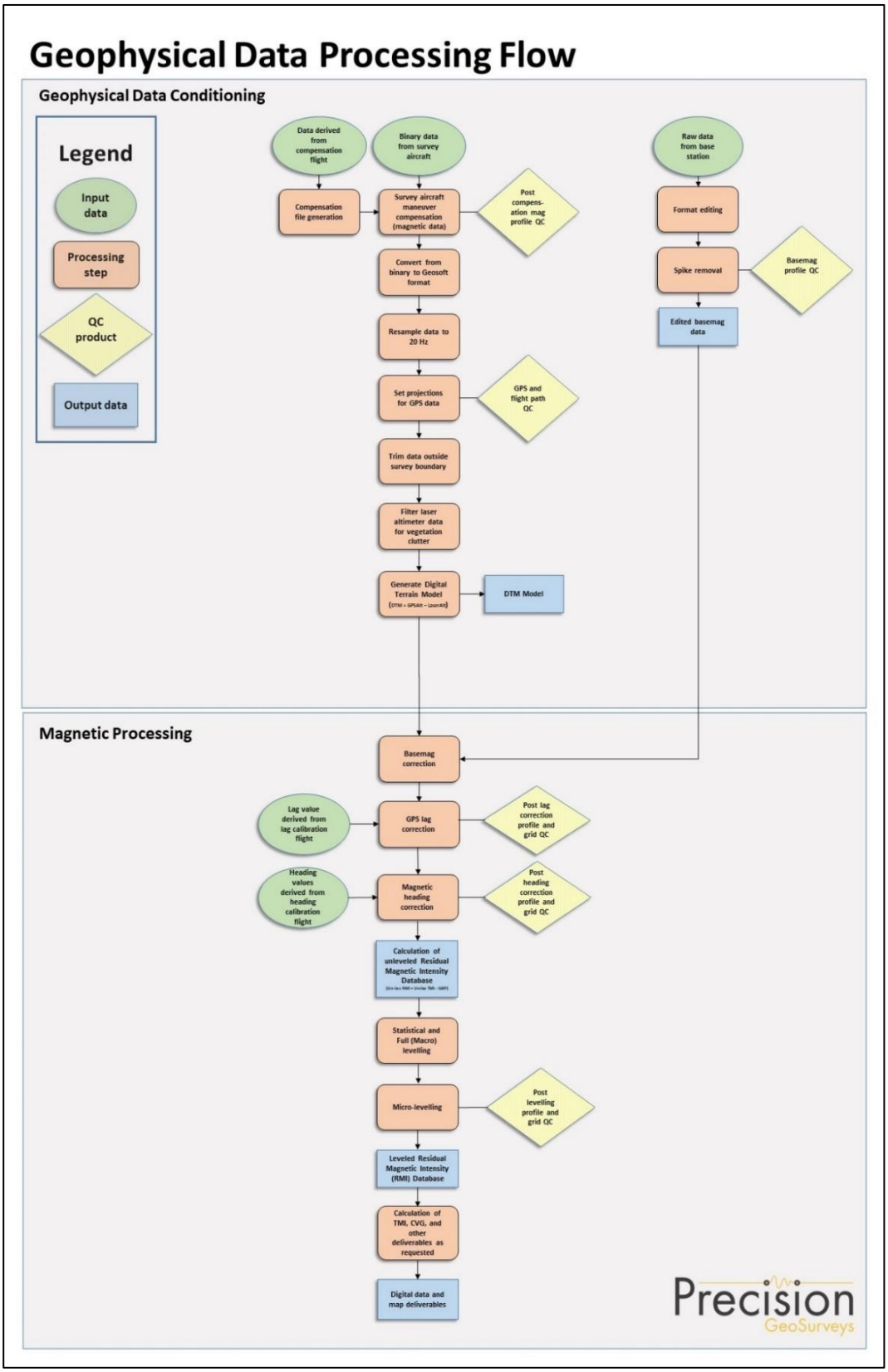


Figure 19: Magnetic data processing flow.

6.1 Position Corrections

In order to collect high resolution geophysical data, the location at which the data were collected and recorded must be accurate.

6.1.1 Lag Correction

A correction for lag error was applied to the geophysical data recorded at each individual sensor to compensate for the combination of lag in the recording system and the sensing instrument flying in a different location from the GPS antenna, as determined during the lag test. Validity of the lag corrections was confirmed by the absence of grid corrugations in adjoining reciprocal lines.

6.2 Flight Height and Digital Terrain Model

Laser altimeters are unable to provide valid data over glassy water or fog which dissipate the laser so that a "zero" reading is recorded. In these cases, estimates of correct height are inserted manually. Dense vegetation generates high frequency variations from leaf and branch reflections. A Rolling Statistics filter is applied to the lag corrected (0.60 seconds lag) laser altimeter data to remove vegetation clutter followed by a Low Pass filter to smooth out the laser altimeter profile to eliminate isolated high frequency noise and generate a surface closely corresponding to the actual ground profile.

A Digital Terrain Model (DTM) was determined by subtracting the laser altimeter data from the filtered GPS altimeter data defined by the WGS 84 ellipsoidal height. DTM accuracy is affected by the attitude of the aircraft, slope of the ground, sample density, and satellite geometry. Small inconsistencies in recorded flight height at the intersection points of survey lines and tie lines resulted in small spatial variabilities in the DTM. Conventional leveling and micro-leveling were applied to correct for these variations and a fully leveled DTM was generated.

6.3 Magnetic Processing

Magnetic data were corrected for temporal variations (including diurnal) and lag. The data were examined for magnetic noise and spikes, which were removed as required. The background magnetic field, International Geomagnetic Reference Field (IGRF) of the Earth, was removed and survey and tie line data of the resulting residual magnetic field were then leveled.

6.3.1 Temporal Variation Correction

The intensity of Earth's magnetic field varies with location and time. The time variable, known as diurnal or more correctly temporal variation, is removed from the recorded airborne data to provide the desired magnetic field at a specified location. Magnetic data from base station GEM

2 were used for correcting the airborne magnetic survey data, and GEM 3 data were retained for backup. The data were edited, plotted, and merged into a Geosoft database (.GDB) on a daily basis.

Base station measurements were averaged to establish a magnetic reference datum of 55279.94 nT. Magnetic deviations relative to the reference datum were used to calculate the observed variations of the Earth's magnetic field over time. The airborne magnetic data were then corrected for temporal variations by subtracting the base station deviations from the data collected on the aircraft, effectively removing the effects of diurnal and other temporal variations.

6.3.2 Heading Correction

For each survey heading, changes in instrument magnetic fields along a survey flight line are detected and these systematic shifts are recorded. These values are used to construct a heading table (.TBL) file. An intersection table was created, containing all magnetic field values where tie lines intersected the survey lines, and the overall average magnetic field value was calculated. For each of the four headings, the averages were calculated and then compared to the overall average to determine four values which were used to correct heading and offset errors in each flight direction.

For this survey, it was determined that a heading correction was not required for the magnetometer in the slung bird.

6.3.3 IGRF Removal

The International Geomagnetic Reference Field (IGRF) model is the empirical representation of Earth's dynamic magnetic field (main core field without external sources) collected and disseminated from satellite data and from magnetic observatories around the world. The IGRF has historically been revised and updated every five years by a group of modellers associated with the International Association of Geomagnetism and Aeronomy (IAGA).

The initial unleveled Residual Magnetic Intensity (RMI) was calculated by taking the difference between the 13th generation IGRF (IGRF-13, released in December 2019) and the non-leveled Total Magnetic Intensity (TMI) to create a more accurate model of individual near-surface magnetic anomalies. This model is independent of time to allow for other magnetic data (previous or future) to be more easily incorporated into each survey database.

6.3.4 Leveling and Micro-leveling

Small inconsistencies in flight height and line location result in variabilities in magnetic intensity measured at the intersection points of survey lines and tie lines. Using the initial Residual Magnetic Intensity (RMI) data (TMI with the IGRF removed), RMI data from survey and tie lines were

leveled to each other. Two types of leveling were applied to the corrected data: conventional leveling and micro-leveling. There are two components to conventional leveling: statistical leveling to level tie lines and full leveling to level survey lines. The statistical leveling method corrected the SL/TL intersection errors that follow a specific pattern or trend. Through the error channel, an algorithm calculated a least-squares trend line and derived a trend error curve, which was then added to the channel to be leveled. The second component was full leveling. This adjusted the magnetic value of the survey lines so that all lines matched the trended tie lines at each intersection point.

Following statistical leveling, micro-leveling was applied to corrected conventional leveled data. This iterative grid-based process removed low amplitude components of flight line noise that remained after tie line and survey line leveling, resulting in fully leveled RMI data. The IGRF was then added back onto the RMI to allow for the production of a leveled TMI grid and map.

6.3.5 Reduction to Magnetic Pole

Reduced to Magnetic Pole (RTP) data were determined from the leveled Residual Magnetic Intensity (RMI) data. The RTP filter was applied in the Fourier domain and rotates the observed magnetic inclination and declination field to what the field would look like at the north magnetic pole, to allow observation of magnetic trends and patterns independent of magnetic inclination and declination. Reducing the dipolar nature of magnetic anomalies is useful for interpretation because peak RTP magnetic values can be related to the centre of magnetic rock bodies and asymmetries in the RTP imagery that closely reflect true dips and plunges.

Inclination and declination values were determined by using March 29, 2022, the last day of the survey. The derived values were used in the following formula:

$$RTP\ (\theta) = \frac{[\sin(I) - I\ \cdot \cos(I) \cdot \cos(D-\theta)]^2}{[\sin^2(I_a) + \cos^2(I_a) \cdot \cos^2(D-\theta)] \cdot [\sin^2(I) + \cos^2(I) \cdot \cos^2(D-\theta)]}$$

where: I is geomagnetic inclination in ° from horizontal
D is geomagnetic declination in ° azimuth from magnetic north
I_a is the inclination for amplitude correction (never less than I). Default is ± 20°. If $|I_a|$ is specified to be less than$|I|$, it is set to I

6.3.6 Horizontal Gradient

Calculated Horizontal Gradient (CHG) is the magnitude of the total horizontal gradient. It is used to estimate contact locations of magnetic bodies at shallow depths, reveal anomaly texture, and highlight anomaly-pattern discontinuities.

If M is the magnetic field, then the CHG is calculated as:

$$\mathrm{CHG}(x,y) = \sqrt{\left(\frac{\partial M}{\partial x}\right)^2 + \left(\frac{\partial M}{\partial y}\right)^2}$$

where: $\frac{\partial M}{\partial x}$ is the E-W gradient
$\frac{\partial M}{\partial y}$ is the N-S gradient

6.3.7 Calculation of Vertical Gradient

Calculated Vertical Gradient (CVG) is the first order vertical derivative of the leveled Residual Magnetic Intensity (RMI) data. It is the vertical rate of change in the magnetic field per unit distance. The vertical gradient is used to enhance shorter wavelength signals; therefore, edges of magnetic anomalies are highlighted, and deep geologic sources in the data are suppressed.

The filter, L, used to produce the nth vertical derivative is described by:

$$L(r) = r^n$$

where: r is the radial component in the wavenumber domain

6.3.8 Analytic Signal

Analytic Signal (AS) is the magnitude of the total magnetic gradient in three axes, determined as the square root of the sum of the squares of the horizontal gradients and vertical gradient. Analytic signal is useful in locating the edges of magnetic source bodies.

If M is the magnetic field, then Analytic Signal (AS) is calculated as:

$$\mathrm{AS}(x,y,z) = \sqrt{\left(\frac{\partial M}{\partial x}\right)^2 + \left(\frac{\partial M}{\partial y}\right)^2 + \left(\frac{\partial M}{\partial z}\right)^2}$$

where: $\frac{\partial M}{\partial x}$ is the E-W gradient
$\frac{\partial M}{\partial y}$ is the N-S gradient
$\frac{\partial M}{\partial z}$ is the vertical gradient

7.0 Deliverables

Larder Lake survey data are presented as digital databases, maps, and a logistics report.

7.1 Digital Data

Digital files have been provided in three formats:

- GDB file for use in Geosoft Oasis Montaj,
- XYZ file,
- CSV Excel comma separated file.

Full descriptions of the digital data and contents are included in Appendix C.

7.1.1 Grids

The digital data were represented as grids as listed below:

- Digital Terrain Model (DTM)
- Total Magnetic Intensity (TMI)
- Residual Magnetic Intensity (RMI) – removal of IGRF from TMI
- Reduced to Magnetic Pole (RTP) – reduced to magnetic pole of RMI
- Calculated Horizontal Gradient (CHG) – total magnitude of the horizontal gradients of RMI
- Calculated Vertical Gradient (CVG) – first order vertical derivative of RMI
- Analytic Signal (AS) – analytic signal of RMI

Magnetic data for the Larder Lake survey blocks were gridded and displayed using the following Geosoft parameters:

- Gridding method: minimum curvature
- Grid cell size: 25 m
- Low-pass desampling factor: 2
- Tolerance: 0.001
- % pass tolerance: 99.99
- Maximum iterations: 100
- Shading effect: inclination at 45° and declination at 045°

All magnetic grids were drawn with a conventional RGB colour shade. Descriptions of colour scales are presented in Appendix C.

7.2 KMZ

Gridded digital data were exported into .KMZ files which can be displayed using Google Earth. The grids can be draped onto topography and rendered to give a 3D view.

7.3 Maps

The following digital map products were prepared for Larder Lake survey blocks:

Overview Maps (colour images with elevation contour lines):

- Actual flight lines, with topographic features
- DTM

Magnetic Maps (colour images with elevation contour lines):

- TMI, with actual flight lines and topographic features
- TMI
- RMI
- RTP
- CHG
- CVG
- AS

All survey maps were prepared in WGS 84 and UTM Zone 17N.

7.4 Report

A pdf copy of the logistics report is included along with digital data and maps. The report provides information on the data acquisition procedures, data processing, and presentation of the survey block data.

8.0 Conclusions and Recommendations

The Larder Lake survey collected 527 line km of high resolution magnetic data over two survey blocks. The data have been processed and plotted on maps as a representation of the magnetic features of the survey area.

Geophysical data processing, particularly leveling and data interpolation routines, tend to smooth the original data so that resolution is reduced. In addition, gridding algorithms are not always able to properly calculate grids where flight height between adjacent flight lines varied due to cultural obstacles or steep terrain, where geological structures are acute to flight lines, where line spacing exceeds the size of the causative anomaly, or near grid margins as in "edge effects." Therefore, subtle geophysical features observed near survey margins or in gridded and derivative-enhanced products must be evaluated with discretion.

The airborne geophysical data were acquired to map the geomagnetic characteristics of the survey area, which are in turn related to the distribution of magnetic minerals in the Earth. Magnetic patterns correspond to the concentration and distribution of magnetite and other magnetic minerals in the subsurface. Therefore, the geophysical data will be useful in mapping lithology, structure, and alteration, which will benefit mineral exploration initiatives and geological studies.

Geophysical data are rarely a direct indication of mineral deposits and therefore interpretation and careful integration with existing and new geological, geochemical, and other geophysical data are recommended to maximize value from the survey investment.

Respectfully submitted,
Precision GeoSurveys Inc.

Jenny Poon, P.Geo.
March 2022

Appendix A

Polygon Coordinates

Larder Lake North Survey Block – WGS 84 Zone 17N

Latitude (deg N)	Longitude (deg W)	Easting (m)	Northing (m)
48.24166	79.60000	603944	5344108
48.22917	79.60000	603969	5342719
48.22917	79.62500	602113	5342686
48.23750	79.62500	602096	5343612
48.23750	79.65000	600240	5343579
48.24583	79.64999	600224	5344505
48.24584	79.67499	598368	5344473
48.25833	79.67499	598344	5345862
48.25834	79.64375	600663	5345903
48.26667	79.64374	600647	5346829
48.26667	79.60626	603429	5346879
48.27084	79.60625	603421	5347342
48.27083	79.60000	603885	5347350
48.27500	79.60000	603876	5347813
48.27500	79.59375	604340	5347822
48.27917	79.59374	604332	5348285
48.27916	79.58750	604795	5348293
48.28334	79.58750	604787	5348757
48.28334	79.57500	605714	5348774
48.28750	79.57501	605705	5349237
48.28750	79.56249	606633	5349254
48.29166	79.56250	606624	5349717
48.29166	79.54375	608015	5349743
48.29584	79.54375	608006	5350207
48.29583	79.53125	608933	5350224
48.28750	79.53125	608951	5349298
48.28750	79.51875	609878	5349316
48.25833	79.51876	609940	5346074
48.25833	79.53750	608549	5346047
48.25000	79.53751	608566	5345121
48.25000	79.53126	609030	5345130
48.24583	79.53125	609039	5344667
48.24583	79.53750	608575	5344658
48.24167	79.53750	608584	5344195
48.24167	79.55625	607192	5344169
48.23750	79.55625	607201	5343705
48.23750	79.57499	605809	5343679
48.24167	79.57500	605800	5344143
48.24166	79.56875	606264	5344151
48.25417	79.56875	606238	5345541
48.25417	79.57500	605774	5345532
48.25833	79.57499	605766	5345995
48.25833	79.60000	603910	5345961
48.25417	79.59999	603919	5345498
48.25416	79.60625	603455	5345489
48.24167	79.60625	603480	5344100

Larder Lake South Survey Block – WGS 84 Zone 17N

Latitude (deg N)	Longitude (deg W)	Easting (m)	Northing (m)
48.20000	79.51876	610065	5339591
48.20000	79.53125	609137	5339573
48.20417	79.53125	609128	5340036
48.20416	79.55000	607735	5340009
48.22500	79.55000	607691	5342325
48.22500	79.51875	610012	5342369

Appendix B

Equipment Specifications

- GEM GSM-19T Proton Precession Magnetometer (Magnetic Base Station)
- Hemisphere R120 GPS Receiver (for pilot navigation)
- Hemisphere R330 GPS Receiver (for data recovery)
- Opti-Logic RS800 Rangefinder Laser Altimeter
- Setra Model 276 Barometric Pressure Sensor
- Scintrex CS-3 Survey Magnetometer
- Billingsley TFM100G2 Ultra Miniature Triaxial Fluxgate Magnetometer
- Nuvia Dynamics IMPAC data recorder system (for navigation and geophysical data acquisition)

GEM GSM-19T Proton Precession Magnetometer (Magnetic Base Station)

Sensitivity	0.15 nT @ 1 Hz
Resolution	0.01 nT (gamma), magnetic field and gradient
Absolute Accuracy	±0.2 nT @ 1 Hz
Operating Range	20,000 nT to 120,000 nT
Gradient Tolerance	Over 7,000 nT/m
Operating Ranges	Temperature: -40°C to +50°C Battery Voltage: 10.0 V minimum to 15 V maximum Humidity: up to 90% relative, non-condensing
Storage Temperature	-50°C to +50°C
Dimensions	Console: 223 x 69 x 40 mm Sensor Staff: 4 x 450 mm sections Sensor: 170 x 71 mm dia. Weight: console 2.1 kg, sensor and staff assembly 2.2 kg
Integrated GPS	Yes

Hemisphere R120 GPS Receiver

GPS Sensor	Receiver Type	L1, C/A code, with carrier phase smoothing (Patented COAST technology during differential signal outage
	Channels	12-channel, parallel tracking (10-channel when tracking SBAS)
	Update Rate	Up to 20 Hz position
	Cold Start Time	<60 s
	SBAS Tracking	2-channel, parallel tracking
	Horizontal Accuracy	<0.02 m 95% confidence (RTK 1, 2) <0.28 m 95% confidence (L-Dif 1, 2) <0.6 m 95% confidence (DGPS 1,3) <2.5 m 95% confidence (autonomous, no SA1)
	Differential Options	SBAS, Autonomous, External RTCM, RTK, OmniSTAR (HP/XP)
Beacon Sensor Specifications	Channels	2-channel, parallel tracking
	Frequency Range	283.5 to 325 kHz
	MSK Bit Rates	50, 100, and 200 bps
L-Band Sensor	Channels	Single channel
	Frequency Range	1530 MHz to 1560 MHz
	Satellite Selection	Manual or Automatic (based on location)
	Startup and Satellite Reacquisition Time	15 seconds typical
Communications	Serial Ports	2 full duplex RS232C
	Baud Rates	4800 – 115200
	USB Ports	1 Communications
	Correction I/O Protocol	RTCM SC-104
	Data I/O Protocol	NMEA 0183
	Timing Output	1 PPS (HCMOS, active high, rising edge sync, 10 kΩ, 10 pF load)
	Raw Data	Proprietary binary (RINEX utility available)
Environmental	Operating Temperature	-30°C to +70°C
	Storage Temperature	-40°C to +85°C
	Humidity	95% non-condensing
Power GPS Sensor	Input Voltage Range	8 to 36 VDC
	Power Consumption	3 Watts
	Current Consumption	< 250 mA @ 12 VDC
	Antenna Voltage Output	5.0 VDC

[1]Depends on multipath environment, number of satellites in view, satellite geometry and ionospheric activity.
[2] Up to 5 km baseline length.
[3] Depends also on baseline length.

Hemisphere R330 GPS Receiver

GPS Sensor	Receiver Type	L1 and L2 RTK with carrier phase	
	Channels	12 L1CA GPS 12 L1P GPS 12 L2P GPS 12 L2C GPS 12 L1 GLONASS (with subscription code) 12 L2 GLONASS (with subscription code) 3 SBAS or 3 additional L1CA GPS	
	Update Rate	10 Hz standard, 20 Hz available	
	Cold Start Time	<60 s	
	Warm Start Time 1	30 s (valid ephemeris)	
	Warm Start Time 2	30 s (almanac and RTC)	
	Hot Start Time	10 s typical (valid ephemeris and RTC)	
	Reacquisition	<1 s	
	Differential Options	SBAS, Autonomous, External RTCM, RTK, OmniSTAR (HP/XP)	
Horizontal Accuracy		RMS (67%)	2DRMS (95%)
	RTK [1, 2]	10 mm + 1 ppm	20 mm + 2 ppm
	OmniSTAR HP [1, 3]	0.1 m	0.2 m
	SBAS (WAAS) [1]	0.3 m	0.6 m
	Autonomous, no SA [1]	1.2 m	2.5 m
L-Band Sensor	Channel	Single channel	
	Frequency Range	1530 MHz to 1560 MHz	
	Satellite Selection	Manual or Automatic (based on location)	
	Startup and Satellite Reacquisition Time	15 seconds typical	
Communications	Serial Ports	2 full duplex RS232	
	Baud Rates	4800 – 115200	
	USB Ports	1 Communications, 1 Flash Drive data storage	
	Correction I/O Protocol	Hemisphere GPS proprietary, RTCM v2.3 (DGPS), RTCM v3 (RTK), CMR, CMR+NMEA 0183, Hemisphere GPS binary	
	Timing Output	1 PPS (HCMOS, active high, rising edge sync, 10 kΩ, 10 pF load)	
	Event Marker Input	HCMOS, active low, falling edge sync, 10 kΩ	
Environmental	Operating Temperature	-40°C to +70°C	
	Storage Temperature	-40°C to +85°C	
	Humidity	95% non-condensing	
Power GPS Sensor	Input Voltage Range	8 to 36 VDC	
	Consumption, RTK	<3.5 W (0.30 A @ 12 VDC typical)	
	Consumption, OmniSTAR	<4.3 W (0.36 A @ 12 VDC typical)	

[1]Depends on multipath environment, number of satellites in view, satellite geometry and ionospheric activity.
[2] Depends also on baseline length.
[3] Requires a subscription from OmniSTAR.

Opti-Logic RS800 Rangefinder Laser Altimeter

Accuracy	±1 m on 1x1 m^2 diffuse target with 50% reflectivity, up to 700 m
Resolution	0.2 m
Communication Protocol	RS232-8, N, 1 ASCII characters
Baud Rate	19200
Data Raw Counts	~200 Hz
Data Calibrated Range	~10 Hz
Data Rate	~200 Hz raw counts for un-calibrated operation; ~10 Hz for calibrated operation (averaging algorithm seeks 8 good readings)
Calibrated Range Units	Feet, Meters, Yards
Laser	Class I (eye-safe), 905 nm ± 10 nm
Power	7 - 9 VDC conditioned required, current draw at full power (~ 1.8 W)
Laser Wavelength	RS100 905 nm ± 10 nm
Laser Divergence	Vertical axis – 3.5 mrad half-angle divergence; Horizontal axis – 1 mrad half-angle divergence; (approximate beam “footprint” at 100 m is 35 cm x 5 cm)
Dimensions	32 x 78 x 84 mm (lens face cross section is 32 x 78 mm)
Weight	<227 g (8 oz)
Casing	RS100/RS400/RS800 units are supplied as OEM modules consisting of an open chassis containing optics and circuit boards. Custom housings can be designed and built on request.

Setra Model 276 Barometric Pressure Sensor

Performance	Accuracy RSS[1] (at constant temp)	±0.25% FS[2]
	Non-Linearity (BSFL)	±0.22% FS
	Hysteresis	0.05% FS
	Non-Repeatability	0.05% FS
	Thermal Effects[3]	Compensated range: 0°C to +55°C (+30°F to +130°F) Zero shift (over compensated range): 1% FS Span shift (over compensated range): 1% FS
	Resolution	Infinite, limited only by output noise level (0.0005% FS)
	Time Constant	10 msecs to reach 90% final output with step function pressure input
	Long Term Stability	0.25% FS / 6 months
Environmental	Temperature	Operating[4]: -18°C to +79°C (0°F to +175°F) Storage: -55°C to +121°C (-65°F to +250°F)
	Vibration	2 g from 5 Hz to 500 Hz
	Shock	50 g (Operating, 1/2 sine 10 ms)
	Acceleration	10 g
Electrical	Circuit	3-Wire[5] (Exc, Out, Com)
	Power Consumption	0.20 W (24 VDC)
	Output Impedance	5 Ω
	Output Noise	<200 µV RMS (0 to 100 Hz)

[1] RSS of non-linearity, hysteresis, and non-repeatability.
[2] FS = 300 mb for 800 – 1100 mb range; 500 for 600 – 1100 mb range; and 20 PSI for 0 to 20 PSIA.
[3] Units calibrated at nominal 70°F. Maximum thermal error computed from this datum.
[4] Operating temperature limits of the electronics only. Pressure media temperatures may be considerable higher or lower.
[5] The separate leads for +EXC, -EXC, +Out, -Out are commoned internally. The shield is connected to the case. For best performance, either the -Exc or -Out should be connected to the case. Unit is calibrated at the factory with -Exc connected to the case. The insulation resistance between all signal leads are tied together and case ground is 10

Scintrex CS-3 Magnetometer

Operating Principal	Self-oscillating split-beam Cesium Vapor (non-radioactive ^{133}Cs)
Operating Range	15,000 nT to 105,000 nT
Gradient Tolerance	40,000 nT/m
Operating Zones	15° to 75° and 105° to 165°
Hemisphere Switching	a) Automatic b) Electronic control actuated by the control voltage levels (TTL/CMOS) c) Manual
Sensitivity	0.0006 nT √Hz rms
Noise Envelope	Typically 0.002 nT peak to peak, 0.1 to 1 Hz bandwidth
Heading Error	±0.20 nT (inside the optical axis to the field direction angle range 15° to 75° and 105° to 165°)
Absolute Accuracy	<2.5 nT throughout range
Output	a) Continuous signal at the Larmor frequency which is proportional to the magnetic field (proportionality constant 3.49857 Hz/nT) sine wave signal amplitude modulated on the power supply voltage b) Square wave signal at the I/O connector, TTL/CMOS compatible
Information Bandwidth	Only limited by the magnetometer processor used
Sensor Head	Diameter: 63 mm (2.5”) Length: 160 mm (6.3”) Weight: 1.15 kg (2.6 lb)
Sensor Electronics	Diameter: 63 mm (2.5”) Length: 350 mm (13.8”) Weight: 1.5 kg (3.3 lb)
Cable, Sensor to Sensor Electronics	3 m (9’ 8”), lengths up to 5 m (16’ 4”) available
Operating Temperature	-40°C to +50°C
Humidity	Up to 100%, splash proof
Supply Power	24 to 35 VDC
Supply Current	Approx. 1.5 A at start up, decreasing to 0.5 A at 20°C
Power Up Time	Less than 15 minutes at -30°C

Billingsley TFM100G2 Ultra Miniature Triaxial Fluxgate Magnetometer

Axial Alignment	Orthogonality better than ±1°
Input Voltage Options	15 to 34 VDC @ 30 mA
Field Measurement Range Options	±100 µT = ±10 V
Accuracy	±0.75% of full scale (0.5% typical)
Linearity	±0.015% of full scale
Sensitivity	100 µV/nT
Scale Factor Temperature Shift	0.007% full scale/°C
Noise	≤12 pT rms/√Hz @ 1 Hz
Output Ripple	3 mV peak to peak @ 2^{nd} harmonic
Analog Output at Zero Field	±0.025 V
Zero Shift with Temperature	±0.6 nT/°C
Susceptibility to Perming	±8 nT shift with ± 5 Gs applied
Output Impedance	332 Ω ± 5%
Frequency Response	3 dB @ >500 Hz (to >4 kHz wide band)
Over Load Recovery	±5 Gs slew <2 ms
Random Vibration	>20 G rms 20 Hz to 2 kHz
Temperature Range	-55°C to +85°C
Acceleration	>60 G
Weight	100 g
Size	3.51 cm x 3.23 cm x 8.26 cm
Connector	Chassis mounted 9 pin male "D" type

Nuvia Dynamics IMPAC data recorder system

(for navigation and geophysical data acquisition)

Functions	Integrated Multi-Parameter Airborne Console (IMPAC) with integrated dual Global Positioning System Receiver (GPS) and all necessary navigation guidance software. Inputs for geophysical sensors - portable gamma ray spectrometer GRS-10/AGRS, MMS4/MMS8 Magnetometer, Herz Totem-2A, A/D converter, temperature/humidity probe, barometric pressure probe, and laser/radar altimeter. Output for the multi-parameter PGU (Pilot Guidance Unit)
Display	Monitor display 600 x 800 pixels; customized keypad and operator keyboard. Multi-screen options for real-time viewing of all data inputs, fiducial points, flight line tracking, and GPS channels by operator
Navigation	Pilot/operator navigation guidance. Software supports preplanned survey flight plan, along survey lines, way-points, preplanned drape profile surfaces
Data Sampling	Sensor dependent
Data Synchronization	Synchronized to GPS position. Supports dual GPS
Data File	PEI Binary data format
Storage	80 GB
Software	DataView: Allows fast data verification and conversion of PEI binary data to Geosoft GBN or ASCII formats MAPConv: For survey preparation, calibration and conversion of maps, and survey plot after data acquisition MAGComp: For calculation of magnetic compensation coefficients AGRS/GRS10 Calibration: High voltage adjustment, linearity correction coefficients calculation, and communication test support AGIS: Real time data acquisition and navigation system. Displays chart/spectrum view in real-time for fast data Quality Control (QC)
Electrical	Multiple ethernet connections, RS232 serial ports, USB ports, and 16-bit differential analog input channels. It can support up to 4 magnetometer sensors
Power Requirement	24 VDC

Appendix C

Digital File Descriptions

- Magnetic Database
- Geosoft Grids
- Maps

Magnetic Database:

Abbreviations used in the GDB/XYZ/CSV files listed below:

CHANNEL	UNITS	DESCRIPTION
X_WGS84	m	UTM Easting – WGS84 Zone 17N
Y_WGS84	m	UTM Northing – WGS84 Zone 17N
Lat_deg	Decimal degree	Latitude – WGS84
Lon_deg	Decimal degree	Longitude – WGS84
Date	yyyy/mm/dd	Dates of the survey flight(s) – Local
FLT		Flight number(s)
LineNo		Line numbers
STL		Number of satellite(s)
GPSfix		1 = non-differential 2 = WAAS/SBAS differential
Heading	degree	Heading of the aircraft
GPStime	HH:MM:SS	GPS time (UTC)
Geos_m	m	Geoidal separation
XTE_m	m	Cross track error
Galt	m	GPS height – WGS84 Zone 17N (ASL)
Lalt	m	Laser altimeter readings (AGL)
DTM	m	Digital Terrain Model
Sample_Density	m	Horizontal distance in meters between adjacent measurement locations; sample frequency is 20 Hz
Speed_km_hr	km/hr	Ground speed of aircraft in km/hr
basemag	nT	Base station temporal variation data
IGRF	nT	International Geomagnetic Reference Field, IGRF-13
Declin	Decimal degree	Calculated declination of magnetic field
Inclin	Decimal degree	Calculated inclination of magnetic field
Mag_Head	nT	Diurnal and lag corrected
TMI	nT	Total Magnetic Intensity
RMI	nT	Residual Magnetic Intensity

Grids:

Larder Lake North Survey Block, WGS 84 Zone 17N, sun inclination at 45° and declination at 045°

File Name	Description	Cell Size (m)
22101_LarderLake_North_DTM_25m.grd	Digital Terrain Model	25
22101_LarderLake_North_TMI_25m.grd	Total Magnetic Intensity	25
22101_LarderLake_North_RMI_25m.grd	Residual Magnetic Intensity	25
22101_LarderLake_North_RTP_25m.grd	Reduced to Magnetic Pole of RMI	25
22101_LarderLake_North_CHG_25m.grd	Calculated Horizontal Gradient of RMI	25
22101_LarderLake_North_CVG_25m.grd	Calculated Vertical Gradient of RMI	25
22101_LarderLake_North_AS_25m.grd	Analytic Signal of RMI	25

Grids:

Larder Lake South Survey Block, WGS 84 Zone 17N, sun inclination at 45° and declination at 045°

File Name	Description	Cell Size (m)
22101_LarderLake_South_DTM_25m.grd	Digital Terrain Model	25
22101_LarderLake_South_TMI_25m.grd	Total Magnetic Intensity	25
22101_LarderLake_South_RMI_25m.grd	Residual Magnetic Intensity	25
22101_LarderLake_South_RTP_25m.grd	Reduced to Magnetic Pole of RMI	25
22101_LarderLake_South_CHG_25m.grd	Calculated Horizontal Gradient of RMI	25
22101_LarderLake_South_CVG_25m.grd	Calculated Vertical Gradient of RMI	25
22101_LarderLake_South_AS_25m.grd	Analytic Signal of RMI	25

Maps:

Larder Lake Survey Block, WGS 84 Zone 17N, sun inclination at 45° and declination at 045°(jpegs, pdfs, and georeferenced pdf)

Plate Num	Plate Name	File Name	Description	Cell Size (m)	Colour Scale	Colour Shade
1	FL	22101_LarderLake_ActualFlightLines	Plotted actual flown flight lines	NA	NA	NA
2	DTM	22101_LarderLake_DTM_25m	Digital Terrain Model	25	Linear	RGB
3	TMI_wFL	22101_LarderLake_TMI_wFL_25m	Total Magnetic Intensity with actual flown flight lines	25	Histogram-equalized	RGB
4	TMI	22101_LarderLake_TMI_25m	Total Magnetic Intensity	25	Histogram-equalized	RGB
5	RMI	22101_LarderLake_RMI_25m	Residual Magnetic Intensity	25	Histogram-equalized	RGB
6	RTP	22101_LarderLake_RTP_25m	Reduced to Magnetic Pole of RMI	25	Histogram-equalized	RGB
7	CHG	22101_LarderLake_CHG_25m.grd	Calculated Horizontal Gradient of RMI	25	Histogram-equalized	RGB
8	CVG	22101_LarderLake_CVG_25m.grd	Calculated Vertical Gradient of RMI	25	Histogram-equalized	RGB
9	AS	22101_LarderLake_AS_25m.grd	Analytic Signal of RMI	25	Histogram-equalized	RGB

*Grids displayed on the maps are exported as GeoTIFFs (.tif) and KMZs.

Plates

Larder Lake Survey Block

- Plate 1: Larder Lake – Actual Flight Lines (FL)
- Plate 2: Larder Lake – Digital Terrain Model (DTM)
- Plate 3: Larder Lake – Total Magnetic Intensity with Actual Flight Lines (TMI_wFL)
- Plate 4: Larder Lake – Total Magnetic Intensity (TMI)
- Plate 5: Larder Lake – Residual Magnetic Intensity (RMI)
- Plate 6: Larder Lake – Reduced to Magnetic Pole (RTP) of RMI
- Plate 7: Larder Lake – Calculated Horizontal Gradient (CHG) of RMI
- Plate 8: Larder Lake – Calculated Vertical Gradient (CVG) of RMI
- Plate 9: Larder Lake – Analytic Signal (AS) of RMI

APPENDIX II - **Airborne Survey maps**

598000 599000 600000 601000 602000 603000 604000 605000 606000 607000 608000 609000 610000

5350000 5349000 5348000 5347000 5346000 5345000 5344000 5343000 5342000 5341000 5340000 5339000

609878 E, 5349316 N

600647 E, 5346829 N

609940 E, 5346074 N

598368 E, 5344473 N

603969 E, 5342719 N

607691 E, 5342325 N

610012 E, 5342369 N

607735 E, 5340009 N

610065 E, 5339591 N

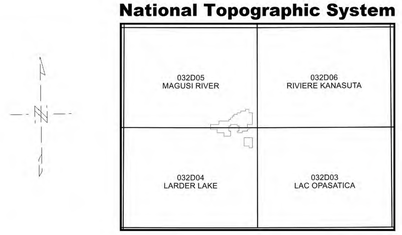
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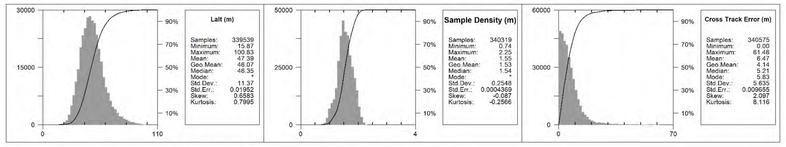
(meters)

WGS 84 / UTM zone 17N

National Topographic System







MAP PROJECTION

Projection: Universal Transverse Mercator Zone 17N
Datum: WGS 84
Local Datum Transform: World

LARDER LAKE SURVEY SPECIFICATIONS

Survey Dates:	March 28 and March 29, 2022
Survey Base:	Kirkland Lake, ON
Aircraft Type:	Airbus AS350 helicopter
Registration:	C-FQCK
Survey Technology:	Magnetic survey
Total Line km:	527 km
Mean Survey Height:	47.4 meters
Survey Line Spacing:	100 meters
Survey Line Direction:	000°/180°
Tie Line Spacing:	1000 meters
Tie Line Direction:	090°/270°

AIRBORNE SURVEY SYSTEM

Magnetometer Sensor:	Scintrex CS-3 Cesium
Configuration:	Slung bird
Sample Rate:	20 Hz
Sensitivity:	0.0006 nT √Hz rms

Legend

Water Bodies.....

Roads.....

Elevation Contours, 50 ft Intervals.....

Larder Lake Survey Block Boundaries.....

Actual Flight Lines.....

TOPOGRAPHIC REFERENCE

National Topographic Data Base (NTDB), Canada. Ottawa, ON: Government of Canada, Natural Resources Canada, Center for Topographic Information.
URL <http://ftp.geogratis.gc.ca/pub/nrcan_rncan/vector/ntdb_bndt/>[2007]

TRILLIUM GOLD™

Larder Lake Survey Blocks

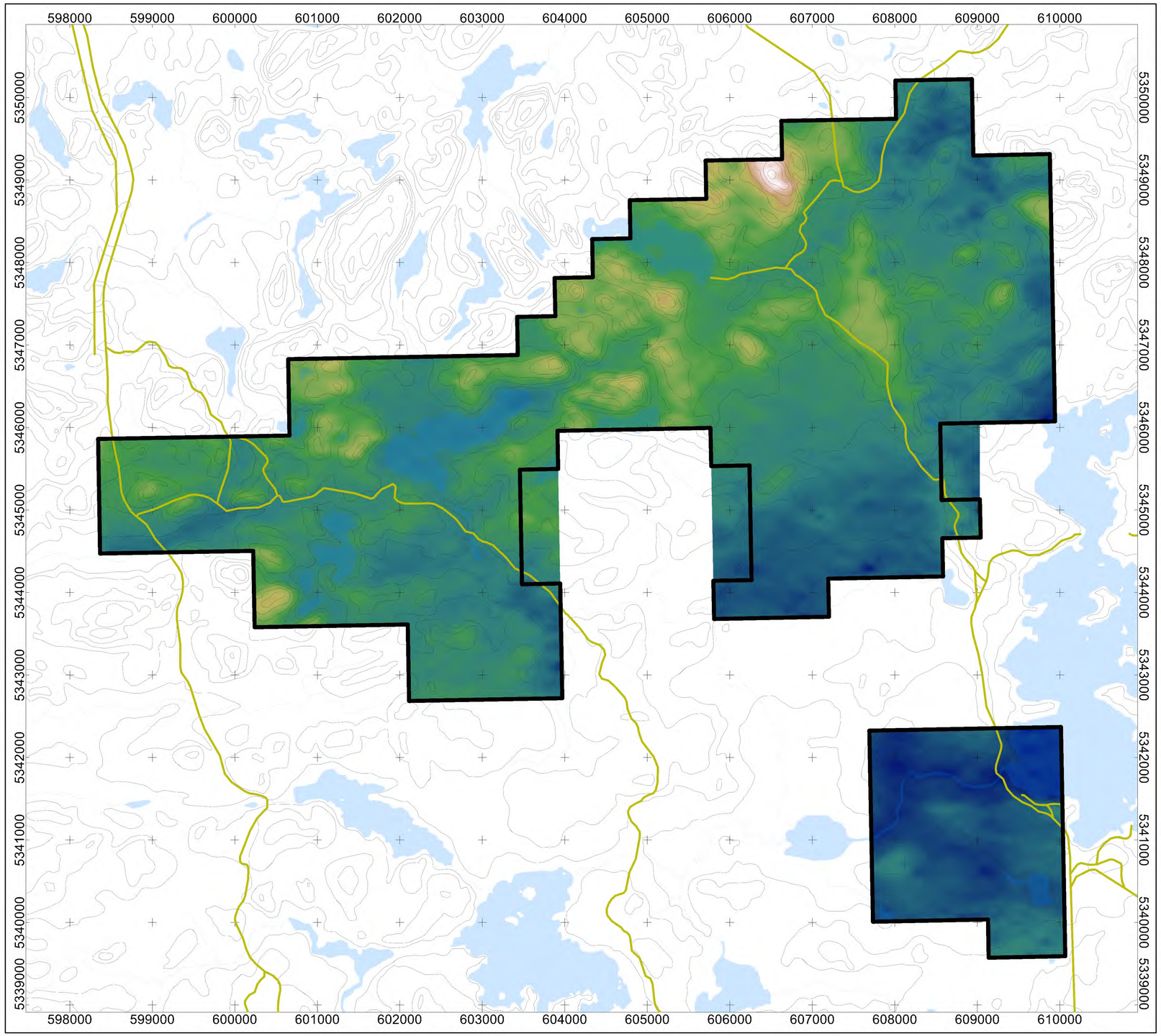
Overview Map

Actual Flight Lines

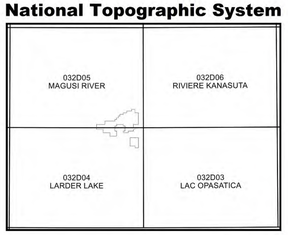
Precision GeoSurveys

Job #22101
March 30, 2022

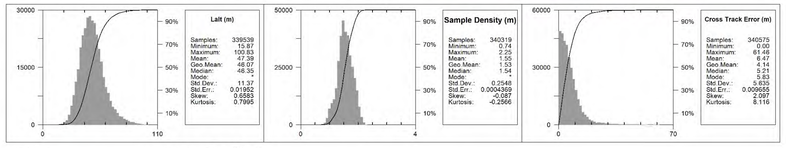
Plate 1
FL



National Topographic System







430.5
427.2
423.8
420.4
417.0
413.7
410.3
406.9
403.5
400.2
396.8
393.4
390.1
386.7
383.3
379.9
376.6
373.2
369.8
366.5
363.1
359.7
356.3
353.0
349.6
346.2
342.9
339.5
336.1
332.7
329.4
326.0
322.6
319.3
315.9
312.5
309.1
305.8
302.4
299.0
295.6
292.3
288.9
285.5
282.2
278.8
275.4
272.0
268.7

DTM
(m)

MAP PROJECTION
Projection: Universal Transverse Mercator Zone 17N
Datum: WGS 84
Local Datum Transform: World

LARDER LAKE SURVEY SPECIFICATIONS

Survey Dates:	March 28 and March 29, 2022
Survey Base:	Kirkland Lake, ON
Aircraft Type:	Airbus AS350 helicopter
Registration:	C-FQCK
Survey Technology:	Magnetic survey
Total Line km:	527 km
Mean Survey Height:	47.4 meters
Survey Line Spacing:	100 meters
Survey Line Direction:	000°/180°
Tie Line Spacing:	1000 meters
Tie Line Direction:	090°/270°

AIRBORNE SURVEY SYSTEM

Magnetometer Sensor:	Scintrex CS-3 Cesium
Configuration:	Slung bird
Sample Rate:	20 Hz
Sensitivity:	0.0006 nT √Hz rms

Legend

Water Bodies.....
Roads.....
Elevation Contours, 50 ft Intervals.....
Larder Lake Survey Block Boundaries.....

TOPOGRAPHIC REFERENCE
National Topographic Data Base (NTDB), Canada. Ottawa, ON: Government of Canada, Natural Resources Canada, Center for Topographic Information.
URL <http://ftp.geogratis.gc.ca/pub/nrcan_rncan/vector/ntdb_bndt/>[2007]

Scale 1:25000
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(meters)
WGS 84 / UTM zone 17N

TRILLIUM GOLD™

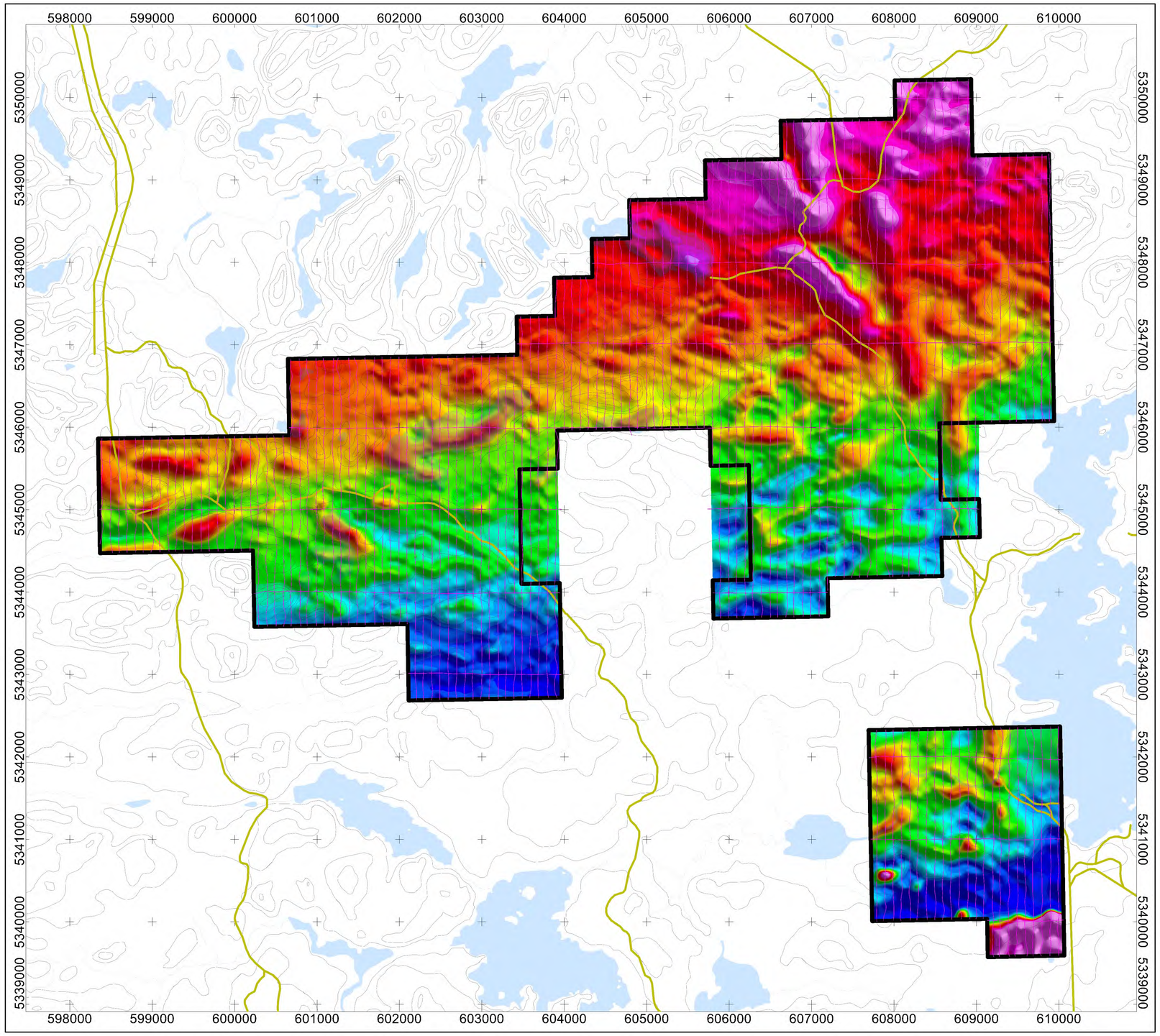
Larder Lake Survey Blocks

Overview Map
Digital Terrain Model

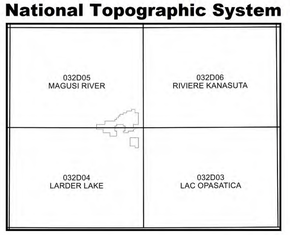
Precision GeoSurveys

Job #22101
March 30, 2022

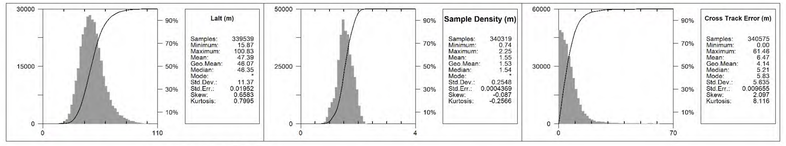
Plate 2
DTM

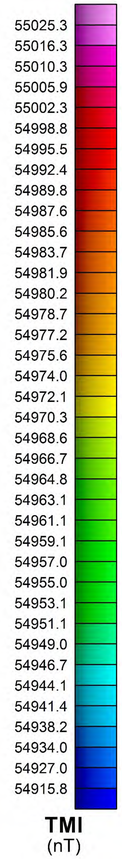


National Topographic System









MAP PROJECTION
Projection: Universal Transverse Mercator Zone 17N
Datum: WGS 84
Local Datum Transform: World

LARDER LAKE SURVEY SPECIFICATIONS

Survey Dates:	March 28 and March 29, 2022
Survey Base:	Kirkland Lake, ON
Aircraft Type:	Airbus AS350 helicopter
Registration:	C-FQCK
Survey Technology:	Magnetic survey
Total Line km:	527 km
Mean Survey Height:	47.4 meters
Survey Line Spacing:	100 meters
Survey Line Direction:	000°/180°
Tie Line Spacing:	1000 meters
Tie Line Direction:	090°/270°

AIRBORNE SURVEY SYSTEM

Magnetometer Sensor:	Scintrex CS-3 Cesium
Configuration:	Slung bird
Sample Rate:	20 Hz
Sensitivity:	0.0006 nT √Hz rms

Legend

Water Bodies.....
Roads.....
Elevation Contours, 50 ft Intervals.....
Larder Lake Survey Block Boundaries.....
Actual Flight Lines.....

DATA REFERENCE
Magnetic data have been compensated and corrected for temporal variations and lag; then leveled to generate the Total Magnetic Intensity (TMI). Refer to report for details. TMI is represented as a grid and drawn with a histogram-equalized colour shade; sun illumination inclination at 45° and declination at 045°.

TOPOGRAPHIC REFERENCE
National Topographic Data Base (NTDB), Canada. Ottawa, ON: Government of Canada, Natural Resources Canada, Center for Topographic Information.
URL <http://ftp.geogratis.gc.ca/pub/nrcan_rncan/vector/ntdb_bndt/>[2007]

Scale 1:25000
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(meters)
WGS 84 / UTM zone 17N

TRILLIUM GOLD™

Larder Lake Survey Blocks

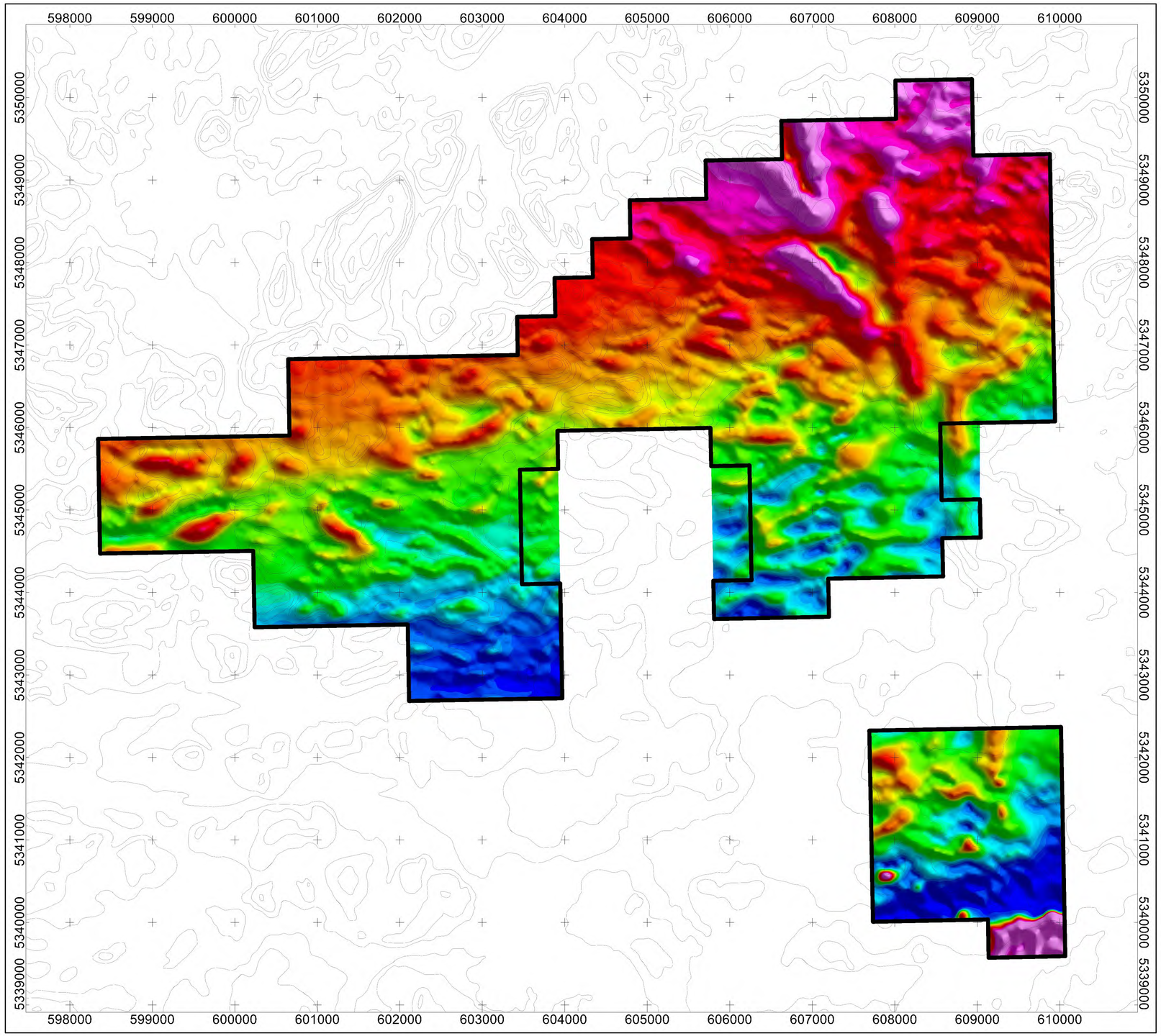
Magnetic Map

Total Magnetic Intensity with Actual Flight Lines

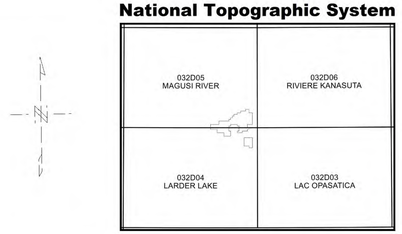
Precision GeoSurveys

Job #22101
March 30, 2022

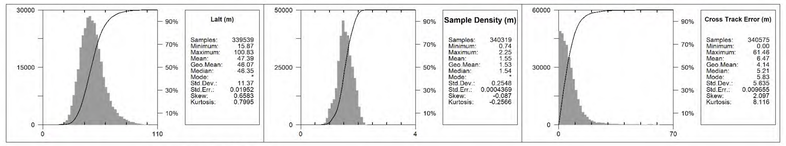
Plate 3
TMI_wFL



National Topographic System







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55016.3
55010.3
55005.9
55002.3
54998.8
54995.5
54992.4
54989.8
54987.6
54985.6
54983.7
54981.9
54980.2
54978.7
54977.2
54975.6
54974.0
54972.1
54970.3
54968.6
54966.7
54964.8
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54961.1
54959.1
54957.0
54955.0
54953.1
54951.1
54949.0
54946.7
54944.1
54941.4
54938.2
54934.0
54927.0
54915.8

TMI
(nT)

MAP PROJECTION
Projection: Universal Transverse Mercator Zone 17N
Datum: WGS 84
Local Datum Transform: World

LARDER LAKE SURVEY SPECIFICATIONS

Survey Dates:	March 28 and March 29, 2022
Survey Base:	Kirkland Lake, ON
Aircraft Type:	Airbus AS350 helicopter
Registration:	C-FQCK
Survey Technology:	Magnetic survey
Total Line km:	527 km
Mean Survey Height:	47.4 meters
Survey Line Spacing:	100 meters
Survey Line Direction:	000°/180°
Tie Line Spacing:	1000 meters
Tie Line Direction:	090°/270°

AIRBORNE SURVEY SYSTEM

Magnetometer Sensor:	Scintrex CS-3 Cesium
Configuration:	Slung bird
Sample Rate:	20 Hz
Sensitivity:	0.0006 nT √Hz rms

Legend

Elevation Contours, 50 ft Intervals.....

Larder Lake Survey Block Boundaries.....

DATA REFERENCE
Magnetic data have been compensated and corrected for temporal variations and lag; then leveled to generate the Total Magnetic Intensity (TMI). Refer to report for details. TMI is represented as a grid and drawn with a histogram-equalized colour shade; sun illumination inclination at 45° and declination at 045°.

TOPOGRAPHIC REFERENCE
National Topographic Data Base (NTDB), Canada. Ottawa, ON: Government of Canada, Natural Resources Canada, Center for Topographic Information.
URL <http://ftp.geogratis.gc.ca/pub/nrcan_rncan/vector/ntdb_bndt/>[2007]

Scale 1:25000
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(meters)
WGS 84 / UTM zone 17N

TRILLIUM GOLD™

Larder Lake Survey Blocks

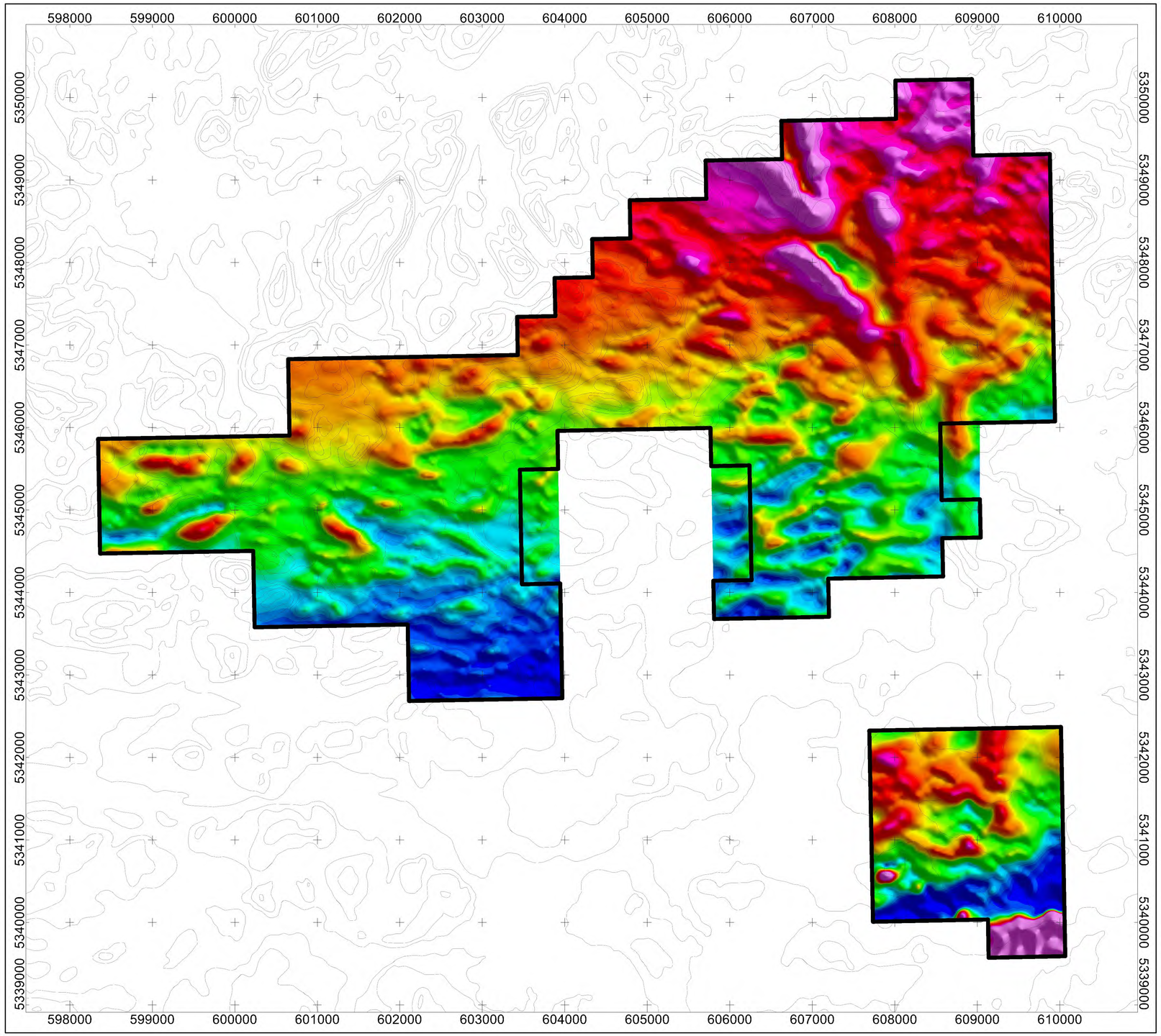
Magnetic Map

Total Magnetic Intensity

Precision GeoSurveys

Job #22101
March 30, 2022

Plate 4
TMI



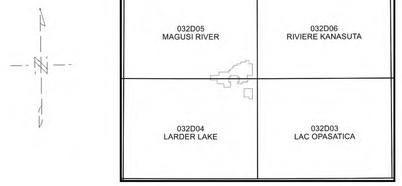
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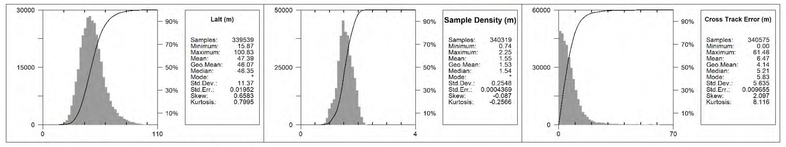
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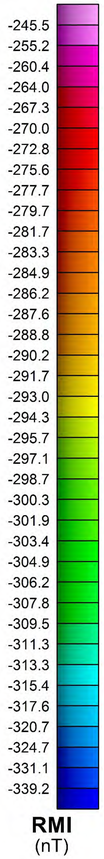
WGS 84 / UTM zone 17N

National Topographic System









MAP PROJECTION

Projection: Universal Transverse Mercator Zone 17N
Datum: WGS 84
Local Datum Transform: World

LARDER LAKE SURVEY SPECIFICATIONS

Survey Dates:	March 28 and March 29, 2022
Survey Base:	Kirkland Lake, ON
Aircraft Type:	Airbus AS350 helicopter
Registration:	C-FQCK
Survey Technology:	Magnetic survey
Total Line km:	527 km
Mean Survey Height:	47.4 meters
Survey Line Spacing:	100 meters
Survey Line Direction:	000°/180°
Tie Line Spacing:	1000 meters
Tie Line Direction:	090°/270°

AIRBORNE SURVEY SYSTEM

Magnetometer Sensor:	Scintrex CS-3 Cesium
Configuration:	Slung bird
Sample Rate:	20 Hz
Sensitivity:	0.0006 nT √Hz rms

Legend

Elevation Contours, 50 ft Intervals.....

Larder Lake Survey Block Boundaries.....

DATA REFERENCE

Residual Magnetic Intensity (RMI) is computed by taking the difference between Total Magnetic Intensity (TMI) and IGRF. Refer to report for details. RMI is represented as a grid and drawn with a histogram-equalized colour shade; sun illumination inclination at 45° and declination at 045°.

TOPOGRAPHIC REFERENCE

National Topographic Data Base (NTDB), Canada. Ottawa, ON: Government of Canada, Natural Resources Canada, Center for Topographic Information.
URL <http://ftp.geogratis.gc.ca/pub/nrcan_rncan/vector/ntdb_bndt/>[2007]

TRILLIUM GOLD™

Larder Lake Survey Blocks

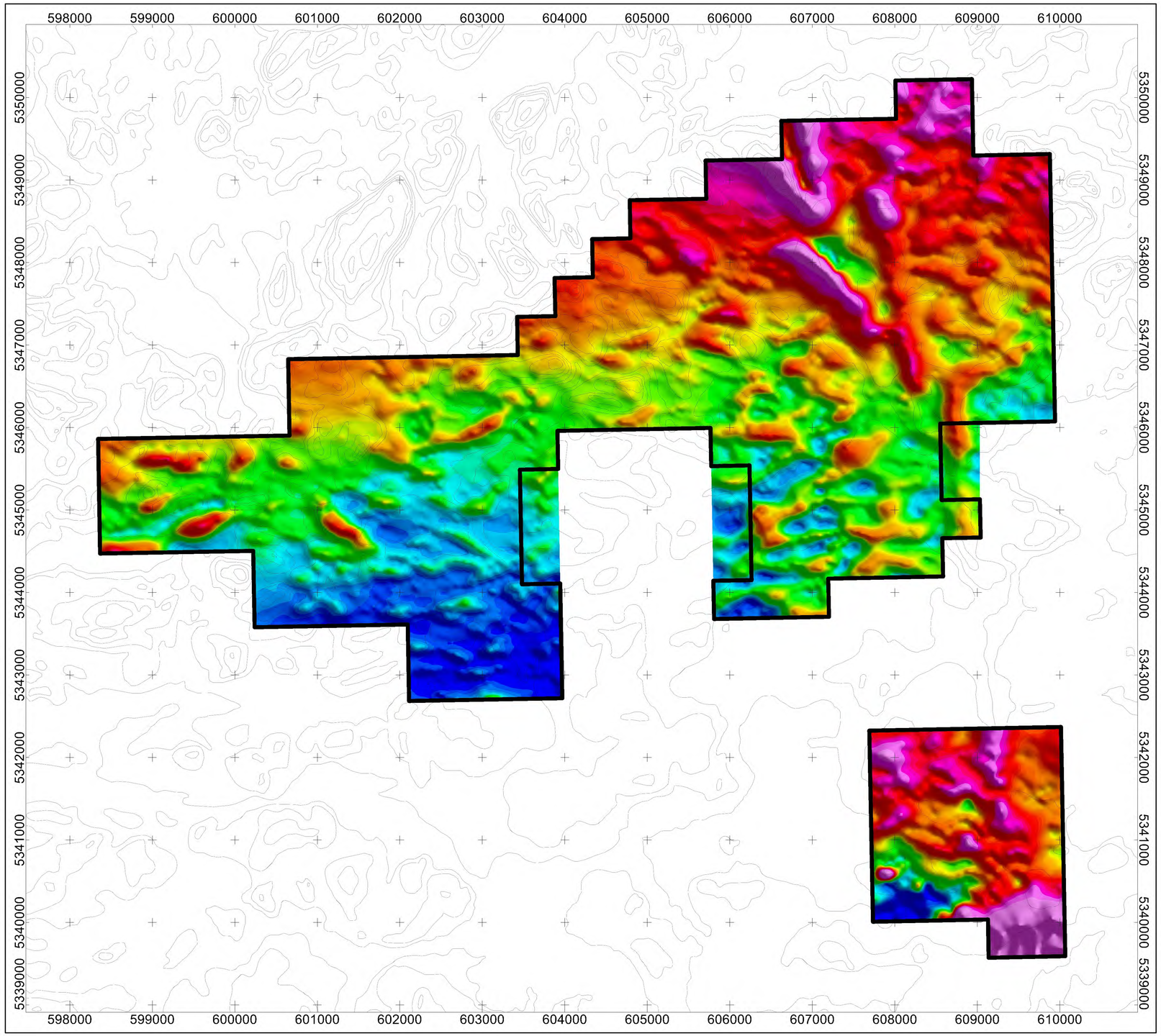
Magnetic Map

Residual Magnetic Intensity

Precision GeoSurveys

Job #22101
March 30, 2022

Plate 5
RMI



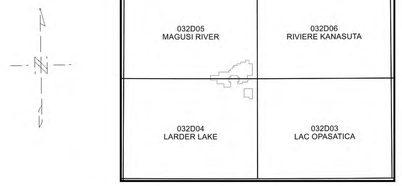
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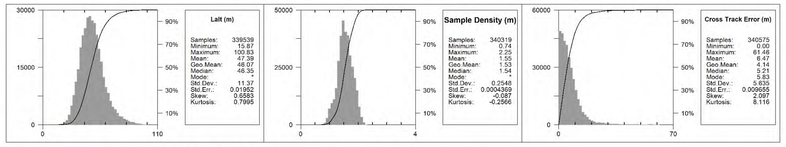
(meters)

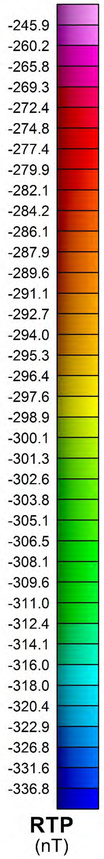
WGS 84 / UTM zone 17N

National Topographic System









MAP PROJECTION

Projection: Universal Transverse Mercator Zone 17N
Datum: WGS 84
Local Datum Transform: World

LARDER LAKE SURVEY SPECIFICATIONS

Survey Dates:	March 28 and March 29, 2022
Survey Base:	Kirkland Lake, ON
Aircraft Type:	Airbus AS350 helicopter
Registration:	C-FQCK
Survey Technology:	Magnetic survey
Total Line km:	527 km
Mean Survey Height:	47.4 meters
Survey Line Spacing:	100 meters
Survey Line Direction:	000°/180°
Tie Line Spacing:	1000 meters
Tie Line Direction:	090°/270°

AIRBORNE SURVEY SYSTEM

Magnetometer Sensor:	Scintrex CS-3 Cesium
Configuration:	Slung bird
Sample Rate:	20 Hz
Sensitivity:	0.0006 nT √Hz rms

Legend

Elevation Contours, 50 ft Intervals.....

Larder Lake Survey Block Boundaries.....

DATA REFERENCE

Reduced to Magnetic Pole (RTP) is computed from Residual Magnetic Intensity (RMI). Refer to report for details. RTP is represented as a grid and drawn with a histogram-equalized colour shade; sun illumination inclination at 45° and declination at 045°.

TOPOGRAPHIC REFERENCE

National Topographic Data Base (NTDB), Canada. Ottawa, ON: Government of Canada, Natural Resources Canada, Center for Topographic Information.
URL <http://ftp.geogratis.gc.ca/pub/nrcan_rncan/vector/ntdb_bndt/>[2007]

TRILLIUM GOLD™

Larder Lake Survey Blocks

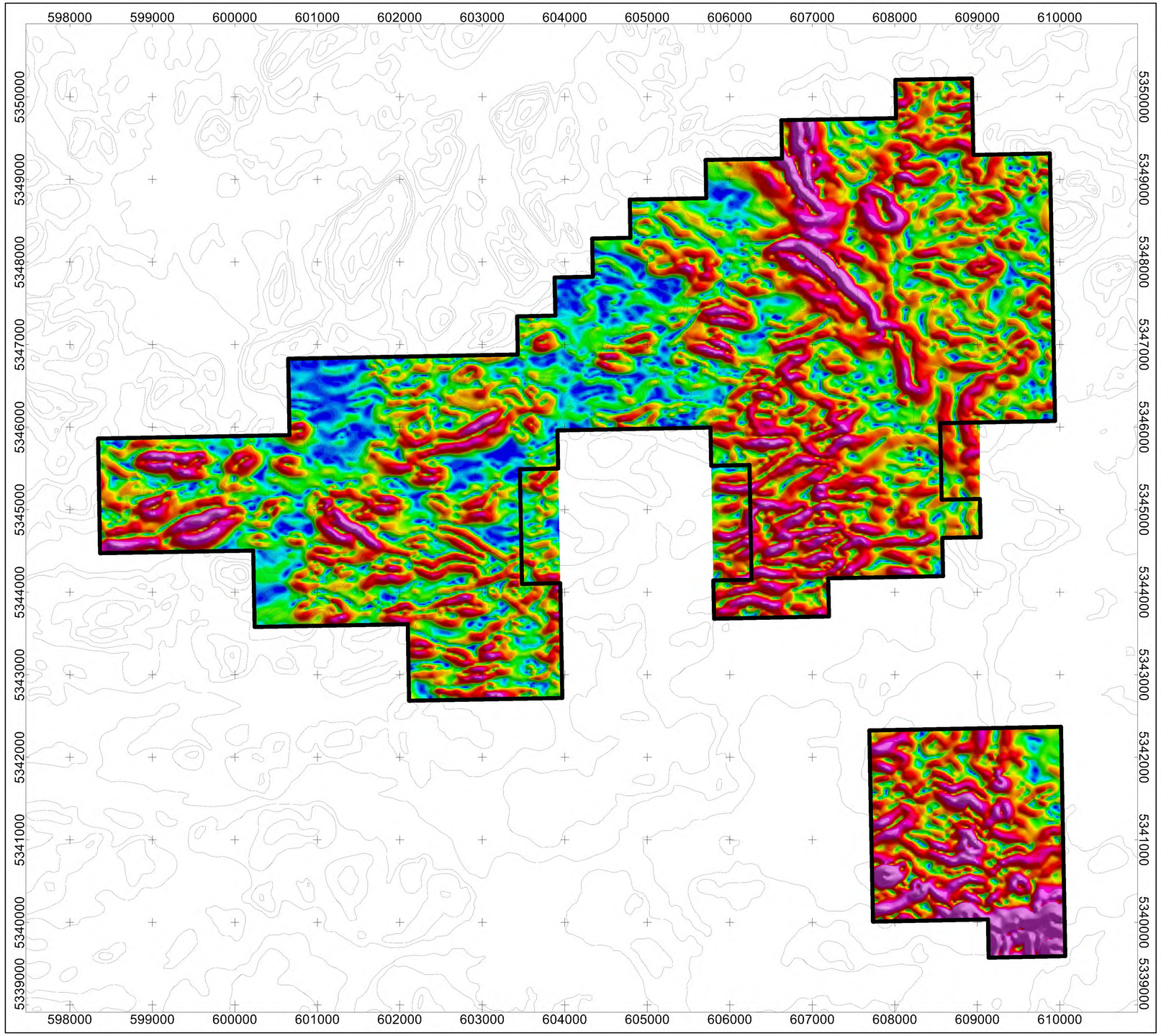
Magnetic Map

Reduced to Magnetic Pole

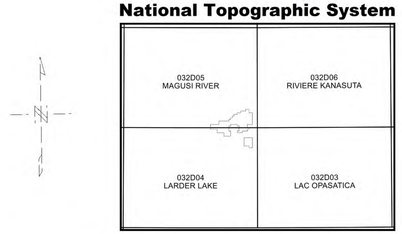
Precision GeoSurveys

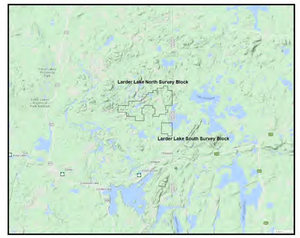
Job #22101
March 30, 2022

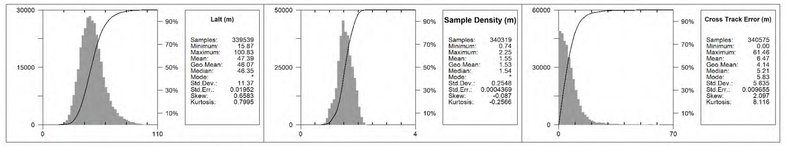
Plate 6
RTP

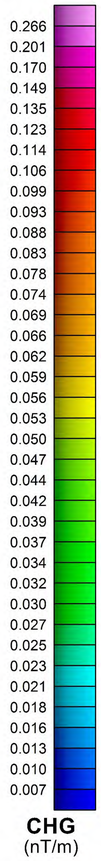


National Topographic System









MAP PROJECTION
Projection: Universal Transverse Mercator Zone 17N
Datum: WGS 84
Local Datum Transform: World

LARDER LAKE SURVEY SPECIFICATIONS

Survey Dates:	March 28 and March 29, 2022
Survey Base:	Kirkland Lake, ON
Aircraft Type:	Airbus AS350 helicopter
Registration:	C-FQCK
Survey Technology:	Magnetic survey
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Survey Line Spacing:	100 meters
Survey Line Direction:	000°/180°
Tie Line Spacing:	1000 meters
Tie Line Direction:	090°/270°

AIRBORNE SURVEY SYSTEM

Magnetometer Sensor:	Scintrex CS-3 Cesium
Configuration:	Slung bird
Sample Rate:	20 Hz
Sensitivity:	0.0006 nT √Hz rms

Legend

Elevation Contours, 50 ft Intervals.....

Larder Lake Survey Block Boundaries.....

DATA REFERENCE
Calculated Horizontal Gradient (CHG) is the magnitude of the horizontal components of Residual Magnetic Intensity (RMI). Refer to report for details. CHG is represented as a grid and drawn with a histogram-equalized colour shade; sun illumination inclination at 45° and declination at 045°.

TOPOGRAPHIC REFERENCE
National Topographic Data Base (NTDB), Canada. Ottawa, ON: Government of Canada, Natural Resources Canada, Center for Topographic Information.
URL <http://ftp.geogratis.gc.ca/pub/nrcan_rncan/vector/ntdb_bndt/>[2007]

Scale 1:25000
500 0 500 1000 1500
(meters)
WGS 84 / UTM zone 17N

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Larder Lake Survey Blocks

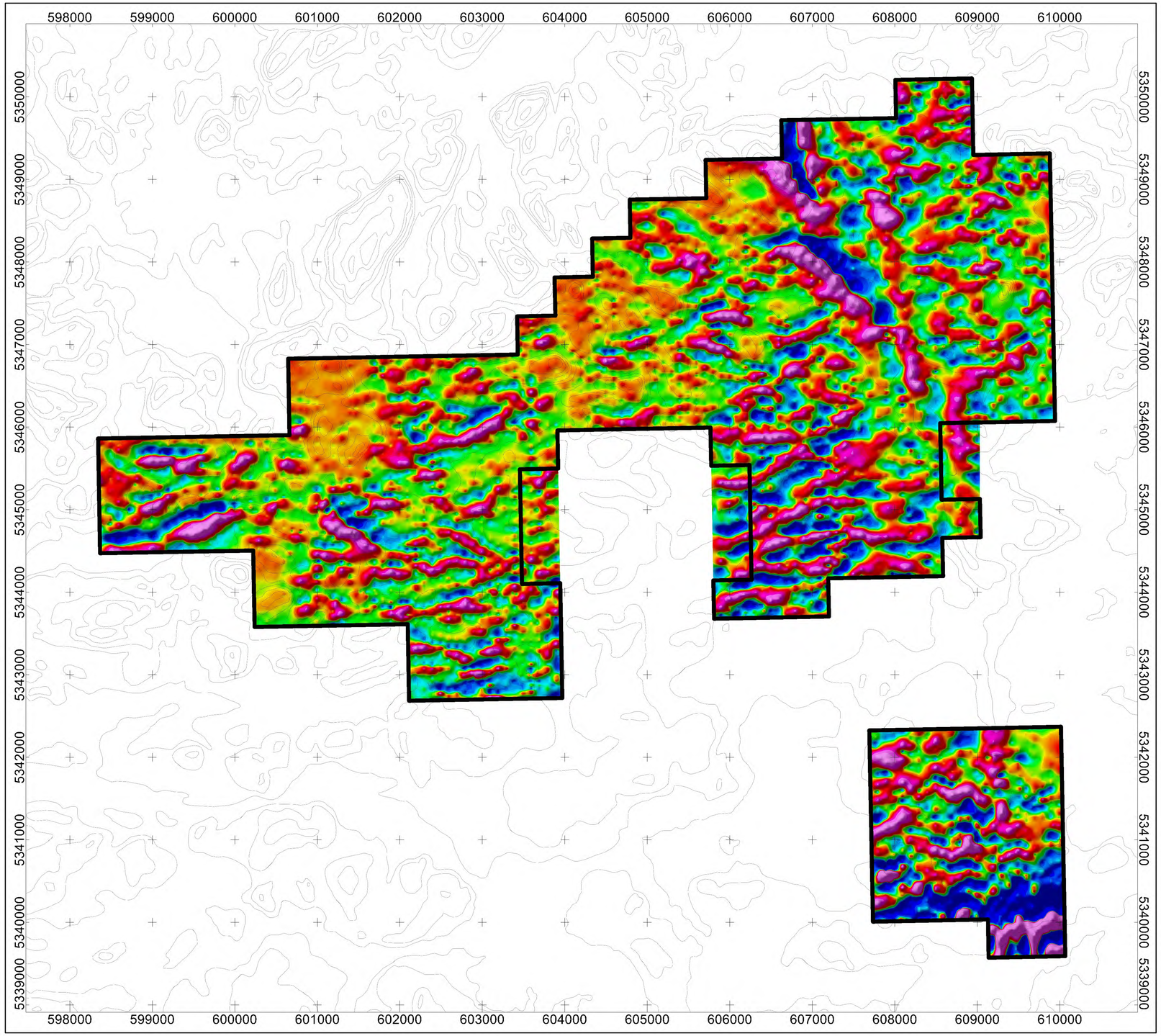
Magnetic Map

Calculated Horizontal Gradient

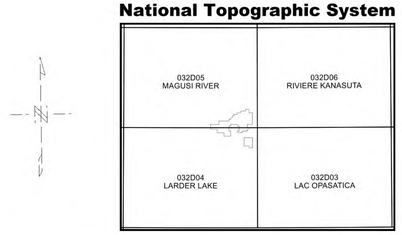
Precision GeoSurveys

Job #22101
March 30, 2022

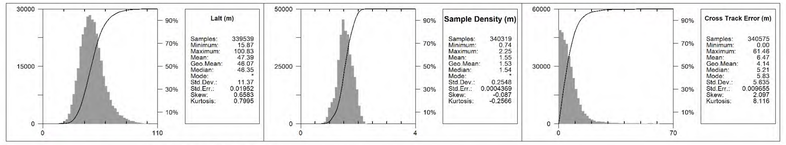
Plate 7
CHG

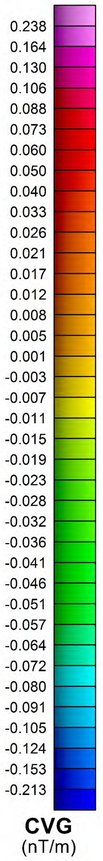


National Topographic System









MAP PROJECTION
Projection: Universal Transverse Mercator Zone 17N
Datum: WGS 84
Local Datum Transform: World

LARDER LAKE SURVEY SPECIFICATIONS

Survey Dates:	March 28 and March 29, 2022
Survey Base:	Kirkland Lake, ON
Aircraft Type:	Airbus AS350 helicopter
Registration:	C-FQCK
Survey Technology:	Magnetic survey
Total Line km:	527 km
Mean Survey Height:	47.4 meters
Survey Line Spacing:	100 meters
Survey Line Direction:	000°/180°
Tie Line Spacing:	1000 meters
Tie Line Direction:	090°/270°

AIRBORNE SURVEY SYSTEM

Magnetometer Sensor:	Scintrex CS-3 Cesium
Configuration:	Slung bird
Sample Rate:	20 Hz
Sensitivity:	0.0006 nT √Hz rms

Legend

Elevation Contours, 50 ft Intervals.....

Larder Lake Survey Block Boundaries.....

DATA REFERENCE
Calculated Vertical Gradient (CVG) is the first order vertical component of Residual Magnetic Intensity (RMI). Refer to report for details. CVG is represented as a grid and drawn with a histogram-equalized colour shade; sun illumination inclination at 45° and declination at 045°.

TOPOGRAPHIC REFERENCE
National Topographic Data Base (NTDB), Canada. Ottawa, ON: Government of Canada, Natural Resources Canada, Center for Topographic Information.
URL <http://ftp.geogratis.gc.ca/pub/nrcan_rncan/vector/ntdb_bndt/>[2007]

Scale 1:25000
500 0 500 1000 1500
(meters)
WGS 84 / UTM zone 17N

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Larder Lake Survey Blocks

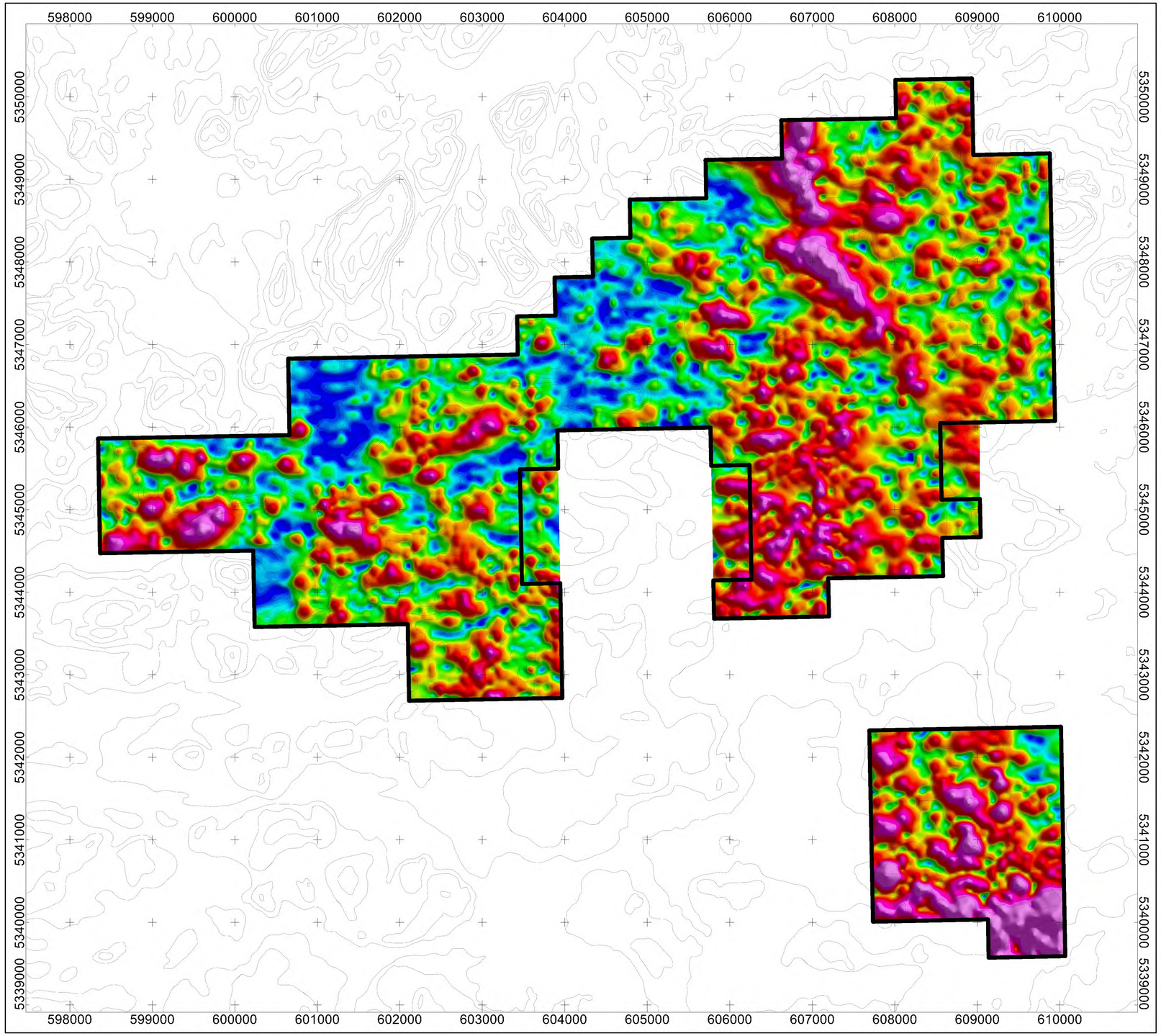
Magnetic Map

Calculated Vertical Gradient

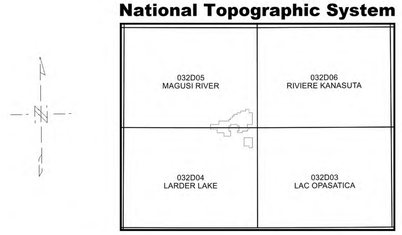
Precision GeoSurveys

Job #22101
March 30, 2022

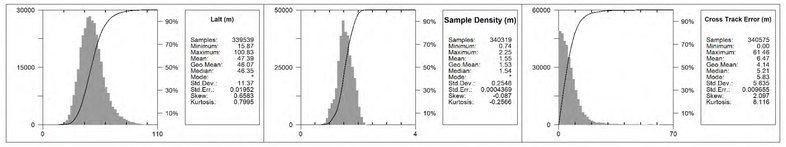
Plate 8
CVG

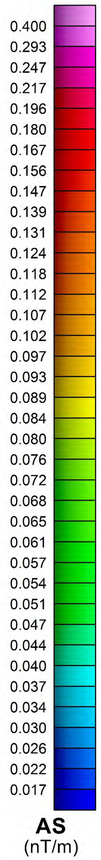


National Topographic System









MAP PROJECTION
Projection: Universal Transverse Mercator Zone 17N
Datum: WGS 84
Local Datum Transform: World

LARDER LAKE SURVEY SPECIFICATIONS

Survey Dates:	March 28 and March 29, 2022
Survey Base:	Kirkland Lake, ON
Aircraft Type:	Airbus AS350 helicopter
Registration:	C-FQCK
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Total Line km:	527 km
Mean Survey Height:	47.4 meters
Survey Line Spacing:	100 meters
Survey Line Direction:	000°/180°
Tie Line Spacing:	1000 meters
Tie Line Direction:	090°/270°

AIRBORNE SURVEY SYSTEM

Magnetometer Sensor:	Scintrex CS-3 Cesium
Configuration:	Slung bird
Sample Rate:	20 Hz
Sensitivity:	0.0006 nT √Hz rms

Legend

Elevation Contours, 50 ft Intervals.....

Larder Lake Survey Block Boundaries.....

DATA REFERENCE
Analytic Signal (AS) is the square root of the sum of the squares of the horizontal and vertical gradients. Refer to report for details. The AS is represented as a grid and drawn with a histogram-equalized colour shade; sun illumination inclination at 45° and declination at 045°.

TOPOGRAPHIC REFERENCE
National Topographic Data Base (NTDB), Canada. Ottawa, ON: Government of Canada, Natural Resources Canada, Center for Topographic Information.
URL <http://ftp.geogratis.gc.ca/pub/nrcan_mcan/vector/ntdb_bndt/>[2007]

Scale 1:25000
500 0 500 1000 1500
(meters)
WGS 84 / UTM zone 17N

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Larder Lake Survey Blocks

Magnetic Map
Analytic Signal

Precision GeoSurveys

Job #22101
March 30, 2022

Plate 9
AS