

RICHMOND MINERALS INC.

REPORT ON THE INTERPRETATION OF  
AIRBORNE MAGNETIC-ELECTROMAGNETIC (INPUT) SURVEY

RIDLEY LAKE (SWAYZE) PROPERTY.

RANEY and ROLLO TOWNSHIPS,  
PORCUPINE MINING DIVISION.  
DISTRICT OF SUDBURY, ONTARIO.

Savaria Geophysics Inc.  
Francis L. Jagodits, P. Eng.,  
Consulting Geophysicist.  
October, 2014.

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TITLE	SCALE
Ontario Geological Survey	
Pole Reduced Magnetic Field	1:10 000
Vertical Gradient of the Pole Reduced Magnetic Field	1:10 000
Magnetic Analytic Signal	1:10 000
Tilt of the Magnetic Field	1:10 000
Terraquest Ltd.	
Contours of Total Magnetic Intensity	1:10 000
Contours of Vertical Gradient of Total Magnetic Intensity	1:10 000
Contours of VLF-EM Total Field Strength	1:10 000
Interpretation Map	1:10 000
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## 1. INTRODUCTION

The Ridley Lake Property of Richmond Minerals Inc. is covered by an airborne magnetic-INPUT survey, conducted by the Ontario Geologic Survey (Ontario Geological Survey, 2003, Swayze Area, Ontario airborne magnetic and electromagnetic surveys, processed data and derived products, Archean and Proterozoic “greenstone” belts; Geophysical Data Set 1015 - Revised, Ontario Geological Survey, Sudbury).

In 1985/1986, Terraquest Surveys Inc. completed an airborne magnetic – VLF-EM in the general area; the Ridley Lake Property is partially covered by the survey.

In order to better understand the general and local geological settings of the known mineralized occurrences the appropriate parts of the surveys were extracted and maps were prepared to facilitate the interpretation of the data sets.

CGI Controlled Geophysics Inc. of Thornhill, Ontario prepared the following maps of the Ontario Geological data set (as solid colour and black contours), showing the claims, geology, the Cyril Knight and Aguara showings, the interpretation of 1983 ground geophysical surveys and topography as background

Pole Reduced Magnetic Field,  
Vertical Gradient of the Pole Reduced Magnetic Field,  
Magnetic Analytic Signal and  
Tilt of the Magnetic Field.

The maps extracted from the Terraquest survey are: contours of the total magnetic field, vertical gradient of the total magnetic field and VLF-EM contours.

The following report describes the interpretation of the airborne data; the interpretation is presented on a base map that also shows the claims, the 1:250 000 geology, the two showings, the ground geophysical grid with the interpretation ( a page-size copy of the interpretation is included in this report).

## 2. LOCATION AND ACCESS

The Ridley Lake property is located in Rollo and Raney Townships, Porcupine Mining Division, and lies within NTS 41 O/15; The claim block is approximately centred on UTM co-ordinates (NAD 83, Zone 17) 371500E and 5392599N (Figure 1). The property is located 40 km south-southwest of the Town of Foyelet, and approximately 120 km west-southwest of Timmins, Ontario.

Originally, the access to the property has been by float equipped aircraft landing on Ridley Lake. Presently, logging roads leading from Hwy. 101 to the property provide access.

## 3. PROPERTY DESCRIPTION

The Ridley Lake Property consists of 154 contiguous, unpatented mining claims, totaling 194 claim units. They are located in Rollo and Raney Townships, Porcupine Mining Division, District of Cochrane, in northwestern Ontario. The listed claims are in the following Table I and illustrated on Figure 2.

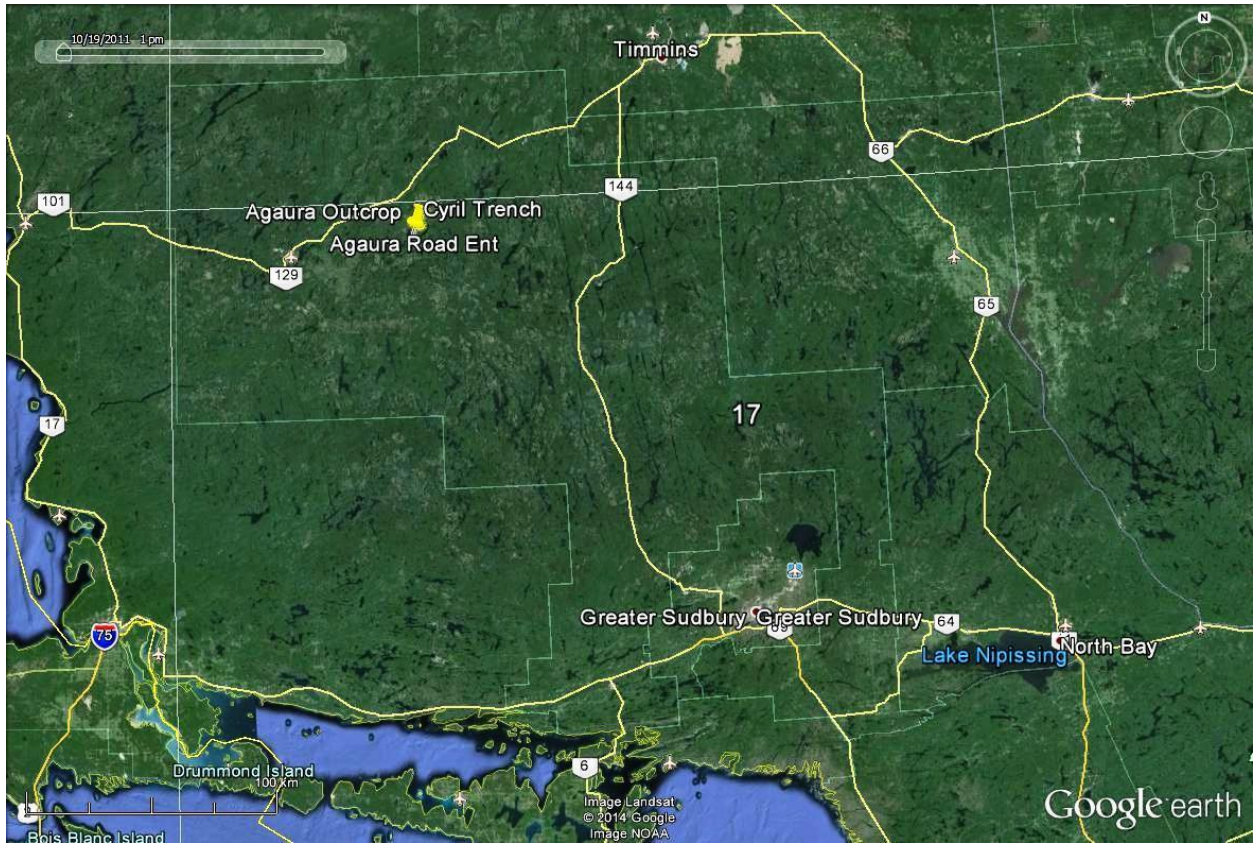


Figure 1. Property Location

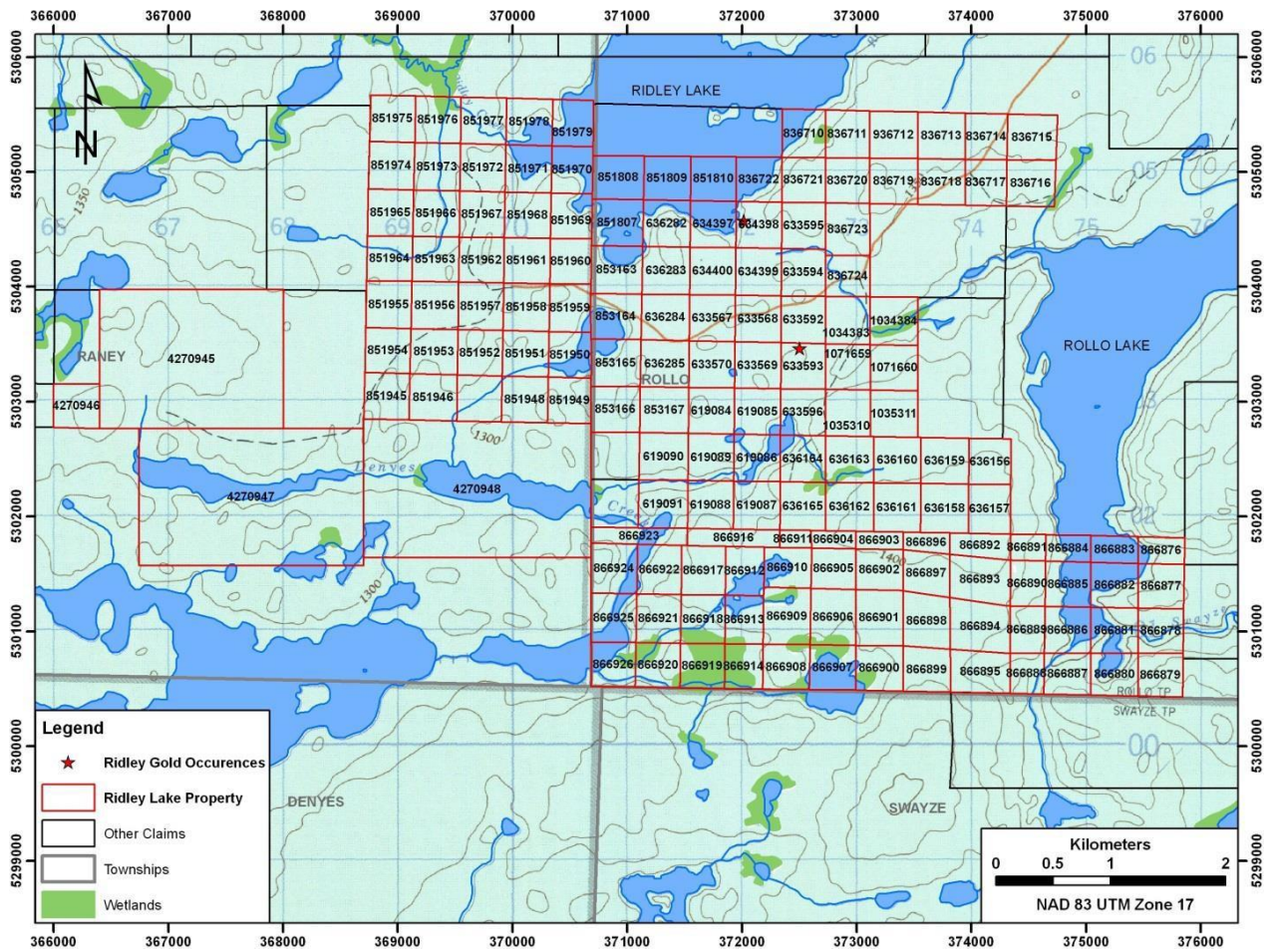


Figure2. Claim Map

#### 4. PREVIOUS WORK (from Hillier, D., 1989)

“Two gold showings exist on the Carson/Black Gregor (now the Ridley) property. The showings are known as the Cyril Knight and Agaura prospects. During 1932, the two showings were controlled by two separate mining companies; the Cyril Knight Prospecting Company Limited and the Agaura Exploration Company Ltd.

The Cyril Knight prospect was trenched and in 1932 described as a gold bearing quartz vein hosted by schisted andesite lavas with an indicated length of approximately 800 feet striking N65°E and dipping 80°SE. The vein was exposed in a trench for 430 feet, with a maximum width of 10 feet and pinched out sharply to the west and narrowed to a series of stringers to the east. The quartz was described to be of the white glassy variety and was highly fractured in a direction parallel to the strike of the vein. The vein reportedly carried a small amount of pyrite and minor native gold (Rickaby 1935).

Previous Carlson geologists interpreted this zone to be a cherty exhalative horizon within a series of schisted, carbonatized, mafic volcanics (Rio, 1983). No drilling was carried out on this zone during the recent drill program.

The Agaura prospect was also trenched during the 1930's and was described as consisting of two similar-striking zones of gold mineralization hosted in quartz-pyrite veins. The "south" zone contained three quartz-pyrite-ankerite +/- Au veins cutting arkosic rock. The centre vein, which was the largest, had a maximum width of 13 inches and a length of approximately 80 feet. One isolated assay reported 0.7 oz/ton Au over 8 inches. Approximately 500 feet north, a highly schistose zone up to 12 feet in width with coarse-grained pyrite and lenses of quartz was located within a greenstone band. Only low gold values were obtained from this zone, which was traced for 500 feet on a strike of N80°E. Approximately 50 feet south and parallel to the sheared zone was a rusty, carbonatized quartz feldspar porphyry dike up to 15 feet wide (Rickaby 1935).

No further work was done on the properties until 1982 when Carlson Mines Ltd. staked a group of 20 claims covering both showings. The property was inspected, for Carlson by Phendler (1982) who reported several anomalous Au values obtained from the 1932/33 trench which exposed the northern volcanic-hosted carbonatized chlorite-pyrite-quartz vein shear zone. At the same time, Newmont Exploration of Canada Ltd. visited the property and collected several samples which generally confirmed Phendler's values. Both showings were IP tested and results indicated that a dipole-dipole array could be used to trace the known mineralized zones.

During the summer of 1983, systematic geological and geophysical surveys were carried out over a 20 claim area of the property. The results of the geological mapping are presented in a report by Rio (1983) which includes a 1"-200' scale map. Geophysical work included a magnetometer survey at 25 ft. 50 ft. and 100 ft. stations; a VLF-EM survey at 100 ft. stations and a time-domain IP survey using a dipole-dipole array with a=50'. Results indicated that both showings displayed coincident magnetometer and IP anomalies of approximately 3x and 4x background respectively.

TABLE I  
 LIST OF CLAIMS  
 RIDLEY LAKE PROPERTY, ONTARIO  
 RICHMOND MINERALS INC.

Township / Area	Claim Number	Recording Date	Claim Due Date	Township / Area	Claim Number	Recording Date	Claim Due Date
RANEY	4270945	2012-Oct-29	2014-Oct-29	ROLLO	636283	1982-Mar-30	1994-Mar-30
RANEY	4270946	2012-Oct-29	2014-Oct-29	ROLLO	636284	1982-Mar-30	1994-Mar-30
RANEY	4270947	2012-Oct-29	2014-Oct-29	ROLLO	636285	1982-Mar-30	1994-Mar-30
RANEY	4270948	2012-Oct-29	2014-Oct-29	ROLLO	836710	1985-Jan-28	1997-Jan-28
RANEY	851945	1985-Jun-21	1993-Jun-21	ROLLO	836711	1985-Jan-28	1997-Jan-28
RANEY	851946	1985-Jun-21	1993-Jun-21	ROLLO	836712	1985-Jan-28	1997-Jan-28
RANEY	851947	1985-Jun-21	1997-Jun-21	ROLLO	836713	1985-Jan-28	1997-Jan-28
RANEY	851948	1985-Jun-21	1997-Jun-21	ROLLO	836714	1985-Jan-28	1997-Jan-28
RANEY	851949	1985-Jun-21	1997-Jun-21	ROLLO	836715	1985-Jan-28	1997-Jan-28
RANEY	851950	1985-Jun-21	1997-Jun-21	ROLLO	836716	1985-Jan-28	1997-Jan-28
RANEY	851951	1985-Jun-21	1997-Jun-21	ROLLO	836717	1985-Jan-28	1997-Jan-28
RANEY	851952	1985-Jun-21	1997-Jun-21	ROLLO	836718	1985-Jan-28	1997-Jan-28
RANEY	851953	1985-Jun-21	1993-Jun-21	ROLLO	836719	1985-Jan-28	1997-Jan-28
RANEY	851954	1985-Jun-21	1993-Jun-21	ROLLO	836720	1985-Jan-28	1997-Jan-28
RANEY	851955	1985-Jun-21	1993-Jun-21	ROLLO	836721	1985-Jan-28	1997-Jan-28
RANEY	851956	1985-Jun-21	1993-Jun-21	ROLLO	836722	1985-Jan-28	1997-Jan-28
RANEY	851957	1985-Jun-21	1997-Jun-21	ROLLO	836723	1985-Jan-28	1997-Jan-28
RANEY	851958	1985-Jun-21	1997-Jun-21	ROLLO	836724	1985-Jan-28	1997-Jan-28
RANEY	851959	1985-Jun-21	1997-Jun-21	ROLLO	851807	1985-Jun-21	1993-Jun-21
RANEY	851960	1985-Jun-21	1997-Jun-21	ROLLO	851808	1985-Jun-21	1993-Jun-21
RANEY	851961	1985-Jun-21	1997-Jun-21	ROLLO	851809	1985-Jun-21	1993-Jun-21
RANEY	851962	1985-Jun-21	1997-Jun-21	ROLLO	851810	1985-Jun-21	1993-Jun-21
RANEY	851963	1985-Jun-21	1993-Jun-21	ROLLO	853163	1985-Oct-25	1993-Oct-25
RANEY	851964	1985-Jun-21	1993-Jun-21	ROLLO	853164	1985-Oct-25	1993-Oct-25
RANEY	851965	1985-Jun-21	1993-Jun-21	ROLLO	853165	1985-Oct-25	1993-Oct-25
RANEY	851966	1985-Jun-21	1993-Jun-21	ROLLO	853166	1985-Oct-25	1993-Oct-25
RANEY	851967	1985-Jun-21	1997-Jun-21	ROLLO	853167	1985-Oct-25	1993-Oct-25
RANEY	851968	1985-Jun-21	1997-Jun-21	ROLLO	866876	1985-Aug-01	1993-Aug-01
RANEY	851969	1985-Jun-21	1997-Jun-21	ROLLO	866877	1985-Aug-01	1993-Aug-01
RANEY	851970	1985-Jun-21	1993-Jun-21	ROLLO	866878	1985-Aug-01	1993-Aug-01
RANEY	851971	1985-Jun-21	1993-Jun-21	ROLLO	866879	1985-Aug-01	1993-Aug-01
RANEY	851972	1985-Jun-21	1993-Jun-21	ROLLO	866880	1985-Aug-01	1993-Aug-01
RANEY	851973	1985-Jun-21	1993-Jun-21	ROLLO	866881	1985-Aug-01	1993-Aug-01
RANEY	851974	1985-Jun-21	1993-Jun-21	ROLLO	866882	1985-Aug-01	1993-Aug-01
RANEY	851975	1985-Jun-21	1993-Jun-21	ROLLO	866883	1985-Aug-01	1993-Aug-01
RANEY	851976	1985-Jun-21	1993-Jun-21	ROLLO	866884	1985-Aug-01	1993-Aug-01
RANEY	851977	1985-Jun-21	1993-Jun-21	ROLLO	866885	1985-Aug-01	1993-Aug-01
RANEY	851978	1985-Jun-21	1993-Jun-21	ROLLO	866886	1985-Aug-01	1993-Aug-01
RANEY	851979	1985-Jun-21	1993-Jun-21	ROLLO	866887	1985-Aug-01	1993-Aug-01
ROLLO	1034383	1988-Aug-04	1993-Aug-04	ROLLO	866888	1985-Aug-01	1993-Aug-01



Township /Area	Claim Number	Recrdin g Date	Claim Due Date
ROIID	1034384	Ø88-Aug-04	Ø93 Aug-04
ROLLO	1035310	Ø88-Aug-04	Ø93-Aug-04
ROLLO	1035311	Ø88-Aug-04	Ø93-Aug-04
ROLLO	1071659	Ø88-Aug-04	Ø93-Aug-04
ROLLO	1071660	Ø88-Aug-04	Ø93-Aug-04
ROLLO	619084	Ø82-Mar-30	Ø94--Mar-30
ROLLO	619085	1982-Mar-30	1994-Mar-30
ROLLO	619086	Ø82-Mar-30	Ø94-Mar-30
ROLLO	619087	Ø82-Mar-30	Ø94--Mar-30
ROLLO	619088	Ø82-Mar-30	Ø94-Mar-30
ROLLO	619089	Ø82-Mar-30	1994-Mar-30
ROLLO	619090	Ø82-Mar-30	Ø94-Mar-30
ROLLO	619091	Ø82-Mar-30	1994-Mar-30
ROLLO	633567	1982-Mar-11	Ø94-Mar-11
ROLLO	633568	Ø82-Mar-11	Ø94-Mar-11
ROLLO	633569	Ø82-Mar-11	Ø94--Mar-11
ROLLO	633570	1982-Mar-11	1994-Mar-11
ROLLO	633592	Ø82-Mar-25	1994-Mar-25
ROLLO	633593	1982-Mar-25	1994-Mar-25
ROLLO	633594	1982-Mar-25	1994-Mar-25
ROLLO	633595	Ø82-Mar-25	1994-Mar-25
ROLLO	633596	Ø82-Mar-25	1994-Mar-25
ROLLO	634397	Ø82-Mar-11	Ø94-Mar-11
ROLLO	634398	1982-Mar-11	1994-Mar-11
ROLLO	634399	Ø82-Mar-11	1994-Mar-11
ROLLO	634400	1982-Mar-11	Ø94-Mar-11
ROLLO	636156	1982-Mar-30	Ø94-Mar-30
ROLLO	636157	Ø82-Mar-30	Ø94--Mar-30
ROLLO	636158	Ø82-Mar-30	Ø94-Mar-30
ROLLO	636159	1982-Mar-30	Ø94--Mar-30
ROLLO	636160	Ø82-Mar-30	Ø94-Mar-30
ROLLO	636161	Ø82-Mar-30	Ø94--Mar-30
ROLLO	636162	1982-Mar-30	Ø94--Mar-30
ROLLO	636163	Ø82-Mar-30	Ø94-Mar-30
ROLLO	636164	Ø82-Mar-30	Ø94-Mar-30
ROLLO	636165	Ø82-Mar-30	Ø94--Mar-30
ROLLO	636282	1982-Mar-30	Ø94-Mar-30

Townsh p /Area	Number	Recrdin g Date	Due Date
ROLLO	866889	Ø85-Aug-01	Ø93-Aug-01
ROLLO	866890	Ø85-Aug-01	Ø93-Aug-01
ROLLO	866891	Ø85-Aug-01	Ø93-Aug-01
ROLLO	866892	Ø85-Aug-01	Ø93-Aug-01
ROLLO	866893	Ø85-Aug-01	Ø93-Aug-01
ROLLO	866894	Ø85-Aug-01	Ø93-Aug-01
ROLLO	866895	Ø85-Aug-01	Ø93-Aug-01
ROLLO	866896	Ø85-Aug-01	Ø93-Aug-01
ROLLO	866897	Ø85-Aug-01	Ø93-Aug-01
ROLLO	866898	Ø85-Aug-01	Ø93-Aug-01
ROLLO	866899	Ø85-Aug-01	Ø93-Aug-01
ROLLO	866900	Ø85-Aug-01	Ø93-Aug-01
ROLLO	866901	Ø85-Aug-01	Ø93-Aug-01
ROIID	866902	Ø85-Aug-01	Ø93-Aug-01
ROLLO	866903	Ø85-Aug-01	Ø93-Aug-01
ROLLO	866904	Ø85-Aug-01	Ø93-Aug-01
ROLLO	866905	Ø85-Aug-01	Ø93-Aug-01
ROLLO	866906	Ø85-Aug-01	Ø93-Aug-01
ROLLO	866907	Ø85-Aug-01	Ø93-Aug-01
ROLLO	866908	Ø85-Aug-01	Ø93-Aug-01
ROLLO	866909	Ø85-Aug-01	Ø93-Aug-01
ROLLO	866910	Ø85-Aug-01	Ø93-Aug-01
ROLLO	866911	Ø85-Aug-01	Ø93-Aug-01
ROLLO	866912	Ø85-Aug-01	Ø93-Aug-01
ROLLO	866913	Ø85-Aug-01	Ø93-Aug-01
ROLLO	866914	Ø85-Aug-01	Ø93-Aug-01
ROLLO	866916	Ø85-Aug-01	Ø93-Aug-01
ROLLO	866917	Ø85-Aug-01	Ø93-Aug-01
ROLLO	866918	Ø85-Aug-01	Ø93-Aug-01
ROLLO	866919	Ø85-Aug-01	Ø93-Aug-01
ROLLO	866920	Ø85-Aug-01	Ø93-Aug-01
ROLLO	866921	Ø85-Aug-01	Ø93-Aug-01
ROLLO	866922	Ø85-Aug-01	Ø93-Aug-01
ROLLO	866923	Ø85-Aug-01	Ø93-Aug-01
ROLLO	866924	Ø85-Aug-01	Ø93-Aug-01
ROIID	866925	Ø85-Aug-01	Ø93-Aug-01
ROLLO	866926	Ø85-Aug-01	Ø93-Aug-01

A major IP anomaly was outlined immediately south of the Agaura showing corresponding to a strong VLF-EM conductor; in addition to other significant, isolated IP and VLF-EM anomalies. Magnetics generally appeared to reflect the distribution of massive mafic volcanic flows containing up to 5% magnetite and outlined a probable diabase dike (Hill, 1986).

During the summer of 1985, a stripping, blasting and systematic sampling program was carried out in the area of the Agaura showing. Results from this program are presented in a report by Hill (1986). Hill distinguished several significant units within the stripped area and his results are included with the present data in this report”.

The results of the ground geophysical surveys were once again examined and their interpretation, conclusions and recommendations are included in a memorandum entitled “Compilation of Geophysical and Geological Data, Ridley Lake (Swayze) Property, Raney and Rollo Townships, District of Sudbury, Porcupine Mining Division Ontario (Jagodits, F. L., March, 2014). The memorandum and a page-size copy of the interpretation map are included in the Appendix and on the Archive DVD.

The primary conclusion of the investigation is that the Agaura type gold mineralization provided distinguishable IP/resistivity signatures. The correlation between IP/resistivity and Cyril Knight Showing is not as exemplary because of lack of data; however, a signature would probably be obtained by properly conducted survey (Jagodits, F.L., March, 2014).

The IP/resistivity survey also detected two targets (Targets 4 and 7) where the apparent IP responses are anomalous but correlated with low apparent resistivities. In both cases the IP trends are associated with or in direct correlation with VLF-EM conductors that may show conductive structures. Possible sources of the IP/resistivity responses include non-magnetic sulphides and graphite (Jagodits, F. L., March, 2014).

## 5. REGIONAL GEOLOGY (from Hillier, D., 1989)

For the sake of completeness, the regional and local geology from Hillier are included.

“The Carlson/Black Gregor property is underlain by part of a major sequence of early Precambrian volcanics and sediments referred to as the Swayze volcanic complex (Goodwin and Ridler, 1970) or the Swayze-Deloro metavolcanic-metasedimentary belt (Thurston et al., 1977).

The Swayze volcanic complex is an E-trending belt composed, from the margins inward, of mafic metavolcanics succeeded by metasediments with several centres of felsic volcanism along its length. To the north, the Deloro volcanic complex underlying Horwood Lake and Reeves-Penhorwood Townships consists predominantly of mafic metavolcanics with only minor metasediments. Together the two complexes form the Swayze Deloro belt (Thurston et al., 1977 from Hill, 1986).

Mapping of the Swayze complex by Rickaby (1934) defined a "basement" greenstone assemblage of mafic to felsic flows and pyroclastics overlain by younger, essentially sedimentary but also felsic volcanic rocks known as the Ridout and Swayze series. Donovan (1965, 1968) defined a more continuous sequence of cyclical mafic-felsic volcanism with intermixed volcanic sedimentation south of Rollo Township. Age relationships among mafic metavolcanics, felsic metavolcanics and metasediments were found to be variable (Hill, 1986).

Thurston et al. (1977) summarized the lithologic descriptions of the Swayze-Detoro belt rocks. Mafic to intermediate metavolcanics are predominant throughout the area and include massive, pillowed, foliated, fragmental (breccia plus tuffs) and porphyritic types. Intermediate to felsic metavolcanic rocks are less common. A major linear zone of massive to porphyritic dacite with associated fragmental and epiclastic sediments extend through the central portion of the Swayze complex just south of Ridley Lake. Elsewhere, felsic metavolcanic flows and tuffs form relatively thin bands within intermediate to mafic metavolcanics. All volcanics have been metamorphosed largely under greenschist conditions and locally under almandine-amphibolite conditions (Hill, 1986).

The metasediments, in order of importance, include greywacke, arkose, conglomerates, quartzite and argillite. Also, intercalated with mafic metavolcanic are thin bands of iron formation or ferruginous metasediments of silicate carbonate or sulphide association. Much of the rock originally mapped as sediments by Rickaby (1935) has been re-interpreted as felsic pyroclastic material. It is apparent that metasediments make up no more than 10% of exposed Swayze-Deloro belt rocks. The most extensive band of metasediments (originally named Ridout series) extends through the southern portion of the Swayze belt and, together with a smaller band in Halcrow and Denyes Townships (previously called the Swayze series) are referred to collectively as the Ridout metasediments (Hill, 1986).

The Swayze-Deloro metavolcanic-metasedimentary belt has been tightly folded into a series of synforms and antiforms which, due to the lack of geological and structural control, are not well defined. Bell (1964) implied that a major east-west synclinal structure south of Rollo Township was overturned with a north-dipping axial plane. Stratigraphic top indicators on the north limb of the syncline faced south, but beds dipped steeply north. Mapping carried out in 1985 on the Carson/Black Gregor property appears to confirm his interpretation (Hill, 1986).

The most common felsic intrusives have been emplaced as dikes and sills of quartz-feldspar porphyry with occasional granitoid stocks. Mafic to ultramafic rocks have intruded the metasedimentary-metavolcanic sequence as diorite to gabbroic sills and stocks of early Precambrian age and, more recently, as three distinct diabase dike sets (Hill, 1986).

## 6. GEOLOGY OF THE AGUARA SHOWING

The following section has been taken from a report by Hill for Carlson Mines Ltd. and Ridley Lake Minerals Corp., Detailed Geological Mapping and Sampling of the Agaura Showing, Ridley Lake Property (1986).

“The general stratigraphic sequence in the area consists of a lower mafic pyroclastic unit (in the north) conformably overlain by approximately 300 feet of massive, rarely pillowed mafic flows, which host the chlorite + pyrite + quartz + *J*- gold shear zones; overlain by an 800 foot thick series of highly altered and deformed felsic pyroclastics which are host to apparently auriferous quartz veins (the 'south zone' of Rickaby, 1935). A quartz feldspar porphyritic intrusion cuts the middle mafic flow unit at its upper contact and appears to have been intruded as a slightly discordant sill-like body. Uppermost in the section, south of the area of defined mineralization, is a thick sequence of intermediate to felsic flows cut by a narrow diabase dyke.”

## 7. THE AIRBORNE GEOPHYSICAL SURVEYS

### 7.1 Ontario Geological Survey

As noted earlier, magnetic and electromagnetic maps were prepared from data of the airborne magnetic/INPUT survey conducted by the OGS. The nominal flight line spacing was 200 m. The EM anomalies are also shown on the derived magnetic maps

### 7.2 Survey by Terraquest Ltd.

In 1985/1986, a fixed-wing, airborne magnetic-VLF-EM survey was conducted in the general area on behalf of Carlson Mines Ltd. The eastern two-thirds of the Ridley Lake property are covered by the airborne survey. CGI Control Geophysics Inc. was retained to window-out the relevant area and to prepare maps of the total magnetic intensity (TMI), vertical gradient of the total magnetic intensity (VG of TMI), and VLF-EM total field strength contours and the interpretation. The maps are included in the DVD Archive and in the Appendix.

The magnetic contour maps provided minimal additional information. The conductor axes, determined from the total field strength, are shown on the Interpretation Map. In a number of instances the airborne conductor axes are verified by the conductors detected by early ground survey (Bowman, 1983) that are also shown on the Interpretation Map.

## 8. DISCUSSION OF THE RESULTS

### 8.1 General Comments

The interpretation of the airborne data is shown on a base map at a scale of 1:10 000, which includes: the topography, the claims and claim numbers, known

geology, the ground geophysical grid with the interpretation of the ground survey data, the showings and the airborne em (INPUT) anomalies.

## 8.2 Magnetic Surveys

The approximate outline of the magnetic bodies are primarily based on the contour map of the vertical gradient and augmented by the contour map of the analytic signal and the contour maps of the magnetic tilt derivative. Depending on the magnetic intensity the bodies are marked as “magnetic”, “moderately magnetic” and “slightly magnetic. Based on coherence of the magnetic anomalies, magnetic domains were outlined; these are Domains A, B C and D.

The approximate locations of the interpreted faults and/or shear zones are based on the interruption of the magnetic trends, VLF-EM indications and narrow magnetic lows.

Magnetic Domain A covers the northern half of the map. It is characterized by large amplitude anomalies, forming three horizons that describe mafic to ultramafic metavolcanic rocks, (Unit 4 of the Precambrian Geologic Units). The northernmost of the horizons is defined by the member anomalies of Magnetic Unit MA1 that extends across the entire map area. It strikes east-west in the west, but turns NE, east of the central part of the unit. Several NS, WNW, ENE and NE interpreted faults suggest intense structural deformation in the central part of the Unit MA1. Anomalies MA2 and MA7 are north of MA1 and also interpreted to show ultramafic rocks.

The central horizon consists of members of Unit MA3. The shorter, NE-SW horizon is about 400 m SE of the Unit MA1. It is noted that Aguara Showing is associated with the south-westernmost anomaly of MA3; the showing appears to be along the southern flank of the anomaly. The underlying rocks are mafic metavolcanics, but the north-easternmost anomaly may be caused by intermediate composition rocks.

The anomalous, sub-parallel IP trend is about 150 m north of the Aguara Showing, and the trend is at the centre or just north of the centre of Unit MA3.

The Cyril Knight is north of the Unit MA1 in an area of magnetic low, describing metasediments or felsic volcanic rocks.

The southern horizon is formed by MA4 and MA6. These also extend across along the entire map area. The east-west striking Unit MA4 is apparently terminated by the northwest-southeast striking MA5. The strike of MA5 is unusual and it may indicate a dyke. The northeast striking, intermittent MA6 is poorly defined and the diminished amplitudes of the anomalies may describe intermediate composition metavolcanics.

Magnetic Domain B is characterized by a lower magnetic background, gently varying magnetic field that could reflect felsic volcanics and metasediments; the outcrops of “foliated tonalite suite” are taken from Ontario 1:250 000 Precambrian Geology map. The east-west striking Magnetic Units MB1, MB2 and MB5 are representatives of continuous horizons of intermediate composition (volcanic?) rocks.

Domain C, still within the claims, includes several anomalies that may reflect intrusives of intermediate composition. Domain D is entirely outside of the claims and it is similar to Domain C; the enclosed anomalies are believed to demarcate intrusives intermediate to basic composition.

The disruption of the magnetic trends allowed the delineation of interpreted faults and shear zones, showing intense deformation of the ultramafic rocks. The dominant strikes are NNE, N and NNW.

### 8.3 INPUT Survey

The occurrences of em responses (INPUT em anomalies) are restricted to Magnetic Domains B, C and D. Conductors IC1A and IC1B describe a 3 000 m long, formational, south dipping, east-west striking conductor. The main part of IC1A is associated with a magnetic low, suggesting that source may be a graphitic/pyritic horizon or a conductive contact. The shorter Conductor IC1B correlates with a low amplitude magnetic anomaly; magnetic sulphides may contribute to the em responses.

Conductor IC2 is associated with the easternmost anomaly of Magnetic Trend MB1. The magnetic correlation and short strike length enhances the significance of the conductor

Conductors IC3A and IC3B form an approximately 2 300 m long, east-west striking, more than likely formational conductor, correlating with a narrow, low amplitude magnetic anomaly trend (MB2). Magnetic trend MB2 can be considered as the continuation of trend MB1, to the west. Weakly magnetic sulphides, non-magnetic sulphides and graphite are believed to be sources of the conduction.

The short strike length Conductor IC4 is along the northern flank of a magnetic anomaly, which is assumed to represent mafic volcanic rocks. Another, short strike length, NE-SW striking Conductor IC5 is within a magnetic low.

Conductors IC1B, IC2, IC3A and IC3B with magnetic correlation could be considered for low priority further exploration, after reviewing the geologic setting.

### 8.4 Airborne and Ground VLF-EM Surveys

The axes of the VLF-EM conductors were outlined on the basis of the VLF- EM contour maps of the Terraquest survey. Not surprisingly, the dominant strike of the axes is northwest-southeast, although east-west axes are also detected.

It is believed that the main source of the VLF-EM conductors is current gathering along conductive shears, contacts and edges of conductive sheets (conductive overburden). The long strike length conductor V1 is coincident with an intermittent INPUT conductor.

## 9. CONCLUSIONS AND RECOMMENDATIONS

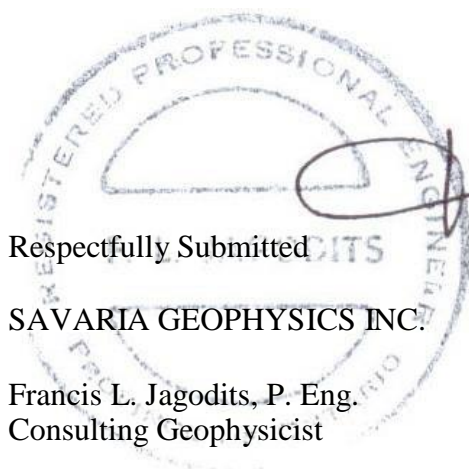
The magnetic contour maps depict three distinct geologic domains of Precambrian rocks. The northerly Domain A covers several horizons of ultramafic volcanic rocks, which are hosted by intermediate volcanics and metasediments. The ultramafic horizons are demarcated by larger amplitude anomalies. The horizons are nearly east-west, in the west, but markedly turn northeast-southwest at the centre of the map area. This change of strike is accompanied by intense structural deformation, indicated by the interpreted faults from the disruption of the anomalies. The Cyril Knight and Aguará Showings are within the NE-SW trending part of the domain. More specifically, the Aguará showing is on the northern flank of an anomaly which is believed to show mafic volcanics.

The magnetic field gently varies over Domain B, except for the east-west striking anomaly trends that may reflect intermediate to mafic composition volcanic strata within the essentially non-magnetic metasediments. Domain C, in the southeast quadrant of the map, encloses anomalies that may indicate intermediate to basic composition intrusive rocks.

It appears that the two showings and the IP anomalous trends are within a north-northwest zone that may be sited within a local zone of structural deformation providing pathways for the mineralizing fluids. Intense structural deformation is suggested by the interpreted Faults F1, F2, F3 and F4. This general area of structural deformation deserves further examination as a prime area where mineralized showings may occur.

As noted above, the majority of the INPUT anomalies (conductors) are formational features and are not readily considered as exploration targets. Conductors with magnetic correlation may deserve further attention.

Based on the results of the IP/Resistivity survey it was established that the gold/pyrite mineralization of the Aguará showing respond well to IP/Resistivity surveying. Recommendations for follow-up surveying are in the Memorandum by the author, located in the Appendix (Jagodits, 2014).



*Francis L. Jagodits*

Respectfully Submitted

SAVARIA GEOPHYSICS INC.

Francis L. Jagodits, P. Eng.  
Consulting Geophysicist



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## 11. APPENDIX

### Writer's Qualification

Compilation of Geophysical and Geological Data, Ridley Lake (Swayze) Property, Raney and Rollo Townships, District of Sudbury, Porcupine Mining Division, Ontario.  
(Jagodits, F.L., 2014).

Induced Polarization/Resistivity Targets, Ridley Lake (Swayze) Property

Maps

## WRITER'S QUALIFICATIONS

Francis L. Jagodits, Dipl. Eng., P.Eng.

This is to certify that I, Francis L. Jagodits,

1. am a Canadian citizen, residing at 353 Berkeley Street in the City of Toronto, Province of Ontario,
2. maintain a consulting office at 353 Berkeley Street, in Toronto, Ontario,
3. graduated with a degree of Diploma Engineer in geophysical engineering from the Technical University of Sopron, Hungary in 1956,
4. am working as professional geoscientist for the past fifty- seven years and as an independent consulting geophysicist for the past thirty years,
5. am registered as a Professional Engineer in the Province of Ontario,
6. am registered as a Retired Professional Engineer and Professional Geoscientist in good standing, in the Province of Newfoundland.
7. am a member of the Society of Exploration Geophysicists, the Canadian Exploration Geophysical Society and the Prospectors and Developers Association of Canada.

Dated at Toronto

This 30th day of October, 2014.

*F.L. JAGODITS*

Francis L. Jagodits, Dipl. Eng., P.Eng.

Memo to: [W. Hawkins](#), Vice-President Exploration, Richmond Minerals Inc.  
Memo from: F. L. Jagodits, Savaria Geophysics Inc.  
Subject: Compilation of Geophysical and Geological Data,  
Ridley Lake (Swayze) Property, Raney and Rollo Townships, District of Sudbury,  
Porcupine Mining Division Ontario  
Date: March 18, 2014

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## 1. **Preamble**

In 1983, ground geophysical surveys were conducted covering the claims of Carlson Mining Ltd. in the Ridley Lake area. The purpose of the present investigation was to define the geophysical signatures of the Cyril Knight and Aguara Showings and to locate similar signatures from the available data.

The investigated Ridley Lake Property lies within NTS 41 O/15 and centred about UTM co-ordinates (NAD 83, Zone 17) 371500E and 5303500N or 17° 52' 29"N latitude and 82° 43' 06" W longitude. It comprises 20 unpatented single mining claims in one contiguous block.

The property is located approximately 50 km east of Chapleau, Ontario and is 120 km southwest of Timmins, Ontario.

The original 20 unpatented single mining claim block was extended. In the following it will be referred to as the Expanded Claim Block

The selected targets, that are based on the IP/resistivity data are listed and discussed in the attached Table 1.

The result of the compilation is on the Compilation Map, at a scale of 1 inch = 200 ft.

## 2. **Geophysical and Geological Data Base**

The Ground Geophysical Survey Maps are from:

Mark Bowman, 1983. Geophysical Report on the Carlson Mines Ltd. Ridley Lake Property, Rollo Township, Sudbury Mining Division and they are:

Postings and contours of total magnetic field; Line interval: 400 ft.; Station interval: 100 ft.

Posting and profiles of in-phase and quadrature components, VLF-EM; Line interval: 400 ft.; Station interval: 100 ft.

Posting and contours of IP observations; n =1 and 2, Line interval: 100 ft.; Station interval: 50 ft. incomplete coverage.

Postings of apparent resistivities;  $n = 1$  and  $2$ .  
Line interval: 100 ft.; Station interval: 50 ft. Incomplete coverage.

The Geology Map is from,

J. K. Filo; Geological Report on the Ridley Lake Prospect in Rollo Township, Sudbury Mining Division for Carlson Mines Ltd. 1983.

The scale of all the maps is 1 inch = 200 ft.

The Airborne Geophysical Survey Maps are from:

Ontario Geological Survey, INPUT/magnetometer survey, 1981 (Swayze)

### **3. The Surveys**

#### **3.1 Magnetic Survey**

The posted magnetic data were contoured at a basic contour interval of 100 nT. There are isolated locations where steep gradients were observed that may be due erroneous observations. A general magnetic low correlates with the mapped diorite in the southwest corner of the claims. The diorite is cut by a northwest-southeast dyke. Another possible northwest-southeast dyke is detected in the northwest of the claims. Most of the claim area is shown to be underlain by mafic volcanics. The magnetic data suggest that the magnetic properties of the mafic volcanics are variable as expressed by the distinct magnetic feature in the east central claim area.

Closer contouring of the data would reveal far more detailed information; however, the recommended magnetic surveys will provide far improved magnetic maps.

#### **3.2 VLF-EM Survey**

The collected data are of good quality. Numerous, nearly east striking conductor were determined. They vary in length from 100 ft. to 2000 ft. They are most likely caused by conductive contacts, shears and faults. The axes of the conductors are shown on the compilation map. Correlations with magnetic and IP features are noted in the attached table.

### 3.3 Induced Polarization/Resistivity Survey

As noted above the survey was incomplete. The survey covered the northeast corner, the general area of the Cyril Knight Showing and the approximate southeast corner of the claim group that includes the Aguara Showing

The dipole-dipole array was utilized using an electrode separation of 50 ft. Observations were made at dipole separations of 1 and 2.

The electrode separation of 50 ft., and the dipole separations of 50 ft. and 100 ft. afforded an approximate 35 ft. of effective depth of investigation. Consequently, only the near surface sources were detected.

In Table I, the amplitudes of the IP responses are noted in terms of the local background. The average or the spread of the apparent resistivities associated with the IP targets are given in 1000's of ohm-m.

Excellent correlation is recognized between the Aguara Showing and IP Target 1 (up to 6xBG) which is associated with apparent resistivities >10 000 ohm-m. The target is open to the east. Unfortunately, IP/resistivity survey coverage is incomplete and it is difficult to establish correlation between the Cyril Knight Showing and the geophysical data. It is noteworthy that IP Target 2b is on strike with the showing, at its northeastern end.

## 4. Conclusions and Recommendations

The primary conclusion of the investigation is that the Aguara type gold mineralization provided distinguishable IP/resistivity signatures. The correlation between IP/resistivity and Cyril Knight Showing not as exemplary because of lack of data; however, The correlation between IP/resistivity and Cyril Knight Showing is not as exemplary because of lack of data; however, a signature would probably be obtained by properly conducted survey (Jagodits, F.L., March , 2014).

The IP/resistivity survey also detected two targets (Targets 4 and 7) where the apparent IP responses are anomalous but correlated with low apparent resistivities. In both cases the IP trends are associated with or in direct correlation with VLF-EM conductors that may show conductive structures. Possible sources of the IP/resistivity responses include non-magnetic sulphides and graphite.

It is recommended:

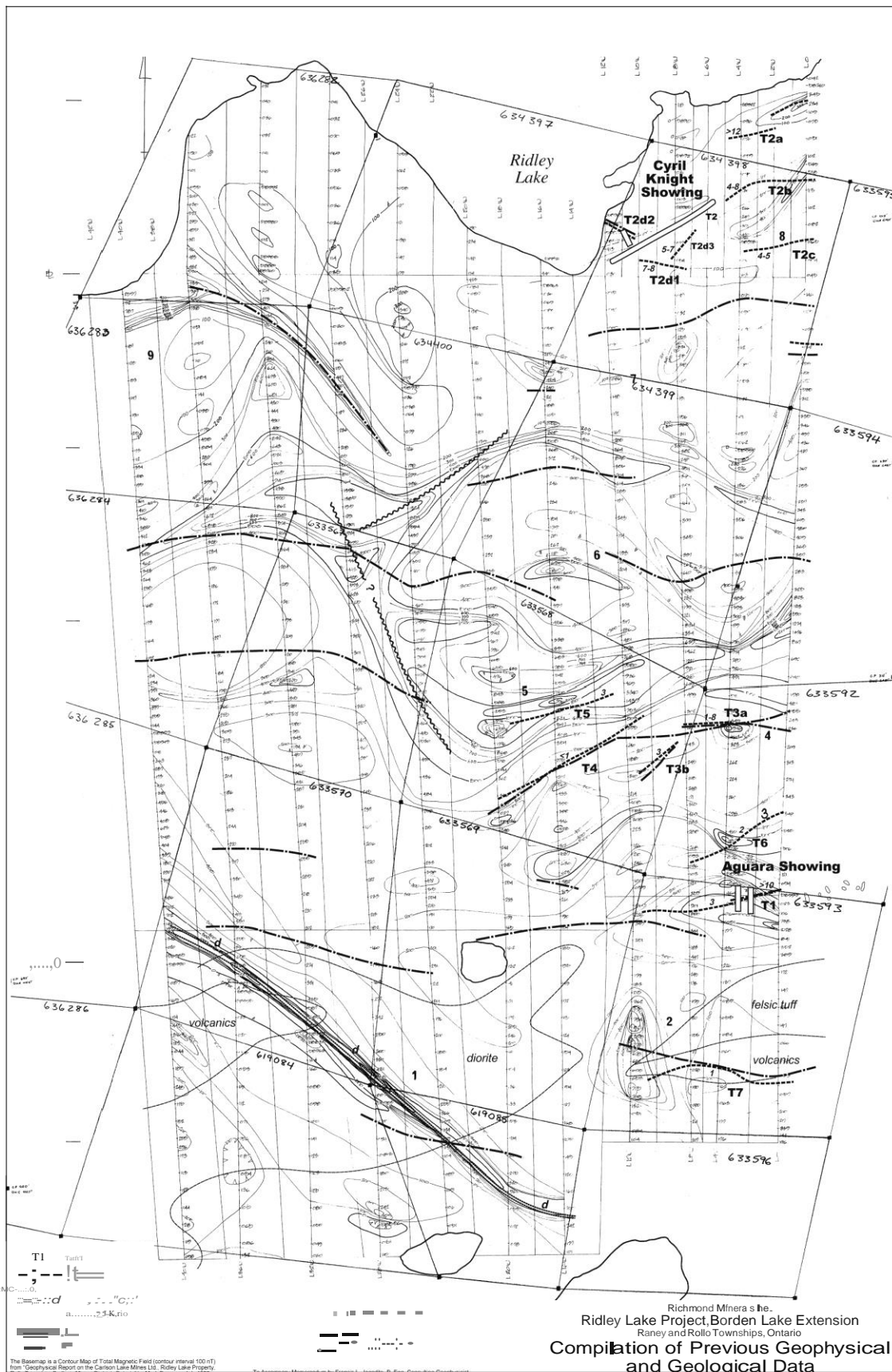
- the preparation of a new base map at a scale of 1:10 000, covering the expanded claim block, showing claims, claim numbers and topographic details,

- incorporation of the base map of the present compilation and the compilation of available exploration data covering the new claim block
- recover the drill hole locations at Aguara Showing,
- drill testing Of the showing,
- establish a grid covering the original claims extending to the east to cover possible extension; line direction: N - S; line interval:75 m; station interval: 25 m,
- ground magnetic total field/gradient survey, if possible with VLF-EM; station interval: 12.5 m,
- Induced Polarization/resistivity survey, initially using gradient array to locate the anomalies, with subsequent detailing using dipole-dipole array,
- geological mapping of the original claims,
- prospecting of the Expanded Claim Block.

Preparation of solid colour and black contour magnetic map, with INPUT anomalies, covering the claim block using the OGS INPUT/magnetometer survey, and

the above map with overlain with geology.





Richmond Minerals Inc.  
Ridley Lake Project, Borden Lake Extension  
Raney and Rollo Townships, Ontario  
Compilation of Previous Geophysical  
and Geological Data

Table 1

INDUCED POLARIZATION/RESISTIVITY TARGETS								
RIDLEY LAKE (SWAYZE) PROPERTY								
RANEY AND ROLLO TOWNSHIPS, ONTARIO								
Target	IP (mV/V)	Resistivity (ohm-m) x 1000	Magnetic Description	VLF-EM	Geology	Strike	Length (ft)	NOTES
T1	6xBG 2xBG	>10	Association	nil	volcanics	E-W	800?	<p>The 300 ft. long eastern end of the IP anomaly coincident with the Aguara Showing, that was reportedly drilled. The amplitude of IP response diminishes to the west. The IP anomaly is open to the east. The apparent resistivity reaches 15 000 ohm-m at the showing.</p> <p>A distinct magnetic anomaly is 200 ft. to the south. The available magnetic data does not allow closer correlation between the IP/Resistivity and magnetic responses.</p> <p>As it stands, it is a first priority drill target.</p>
T2								<p>Target 2 consists of several subsidiary targets that will be discussed individually. Targets 2a, 2b, 2c, and 2d form a cluster in the northeast of the claim group. Targets 2a, 2b, and 2c are open to the east. Target 2d terminates at shore of Ridley Lake. Northeast striking, 700 ft. long Cyril Knight Showing is in the general area of the "2" targets. Based on the available partial IP data, direct correlation between the showing and IP is not apparent. Significantly, the distinct Target 2b is on strike, commencing about 100 ft. northeast of the end of the showing.</p> <p>The magnetic data are incomplete in this region.</p>
T2a	2xBG	>10	?	nil	volcanics	E-W	400?	As noted earlier, the target is open to the east. Because of the missing data points the target is ill defined.
T2b	5xBG	7, 8	?	nil	volcanics	E-W	500?	The apparent resistivities are somewhat lower, but still above background. The on-strike proximity of Cyril Knight Showing improves the target importance.
T2c	<2xBG	4, 5	?	nil	volcanics	E-W	300?	Because of the lower IP responses and lower apparent resistivities, 2c is a less attractive target
T2d	5xBG	7, 8 ; 5, 7	?	nil	volcanics	E-W (2d1, 2d2) NE-SW	200, 200 200	The three parts of 2d are based on partial data. Parts 2d1 and 2d2 are nearly perpendicular to the Cyril Kinight Showing, while 2d3 is subparallel to it. Although there is no apparent direct correlation with the showing, this lies in an anomalous region. New IP/resistivity survey will define the target.
T3a, T3b	up to 4xBG	1,5 ; 3	?	partial corr.	volcanics	E-W (3a) NE-SW (3b)	600 (3a) 350 (3b)	Target 3a is in indirect correlation with a VLF-EM conductor. IP amplitudes of 3a are diminishing to the east but the anomaly is open to the east. The IP amplitudes improve along Target 3a. The magnetic data are non-descript.
T4	10xBG	<1	?	direct corr.	volcanics	NE-SW	1000	The large amplitude, well defined anomaly is associated with low apparent resistivities. The VLF-EM conductor may indicate a shear zone. It appears to be associated with a magnetic low.

Appendix

Table 1 (cont.)

Target	IP (mV/V)	Resistivity (ohm-m) x 1000	Magnetic Description	VLF-EM	Geology	Strike	Length (ft)	NOTES
T5	2xBG	3	association	nil	volcanics	NE-SW	600?	This poor IP anomaly is subparallel to and 200 ft north of Target T4. It is on the southern flank of a narrow, large amplitude anomaly. Basic volcanic flow?
T6	>2XBG	2	?	nil	volcanics	NE-SW	600 ?	The target is 400 ft. north of and subparallel to Target 1. IP responses are very poor. The magnetic anomaly intersects the IP trend at an oblique angle.
T7	<8xBG	<1	association	partial corr.	volcanics	E-W	800 ?	The target is open to the east. The large IP amplitudes are associated with low apparent resistivities. It lies within a general magnetic low.

## MAPS

Base Map  
Base Map and Geology

### OGS MAPS

Pole Reduced Magnetic Field  
Vertical Gradient of the Pole Reduced Magnetic Field  
Magnetic Analytic Signal  
Tilt of the Magnetic Field  
Flight Path and EM Anomalies

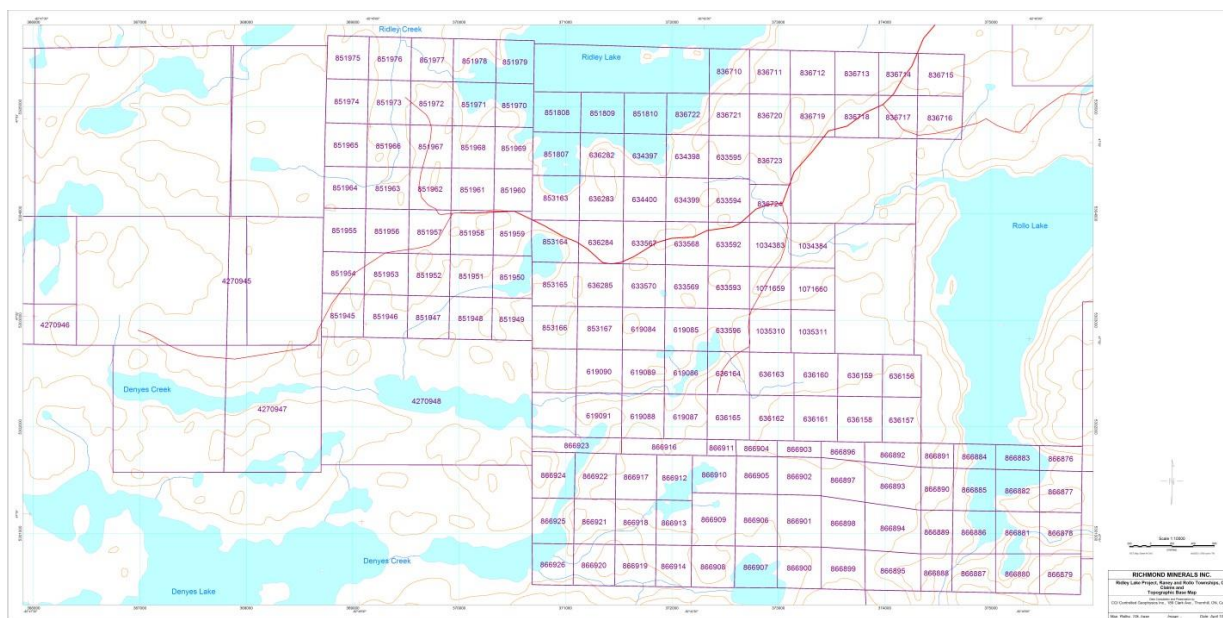
### TERRAQUEST LTD. (1096) MAPS

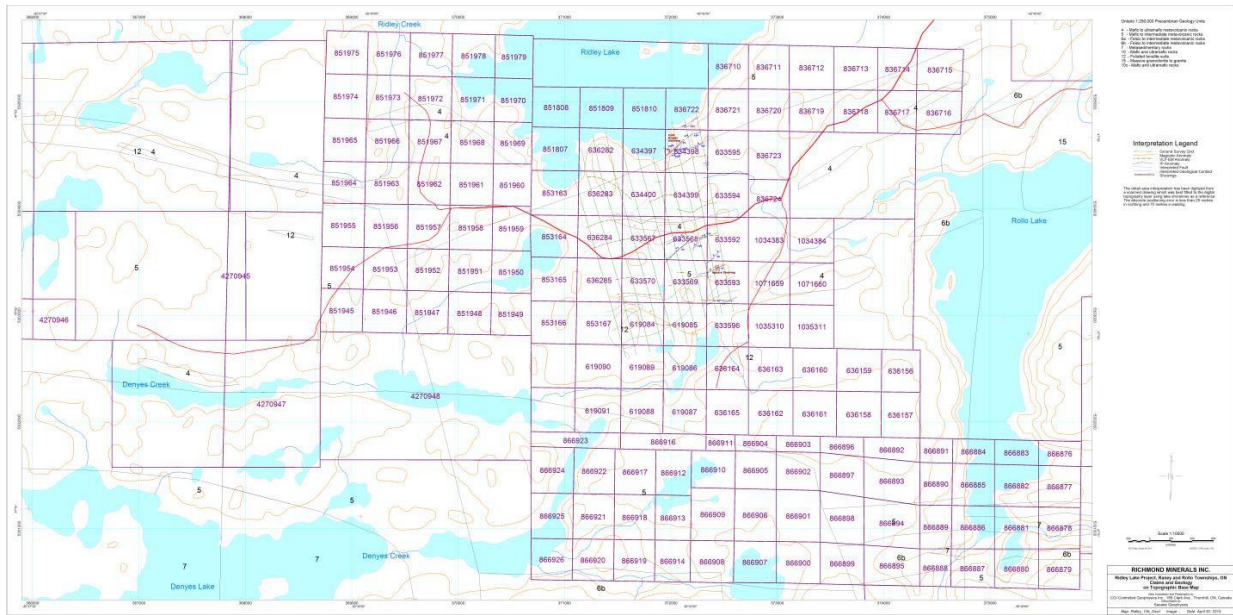
Contours of Total Magnetic Intensity  
Contours of Vertical Gradient of Total Magnetic Intensity  
Contours of VLF-EM Total Field Strength  
Interpretation Map

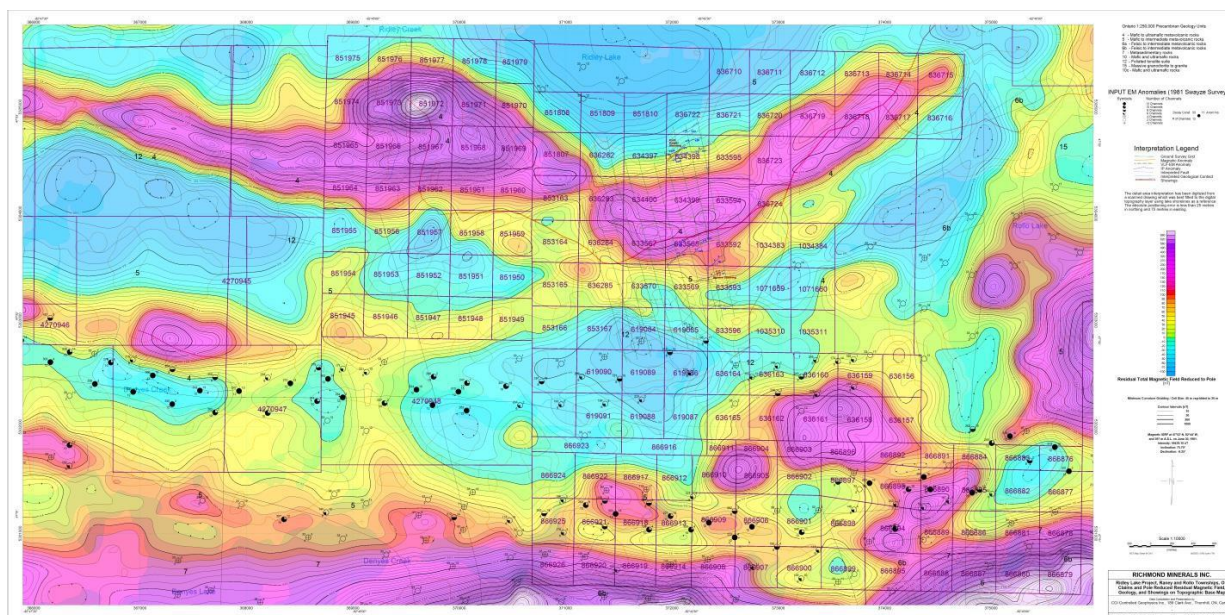
### GROUND GEOPHYSICAL MAPS AND GEOLOGY MAP

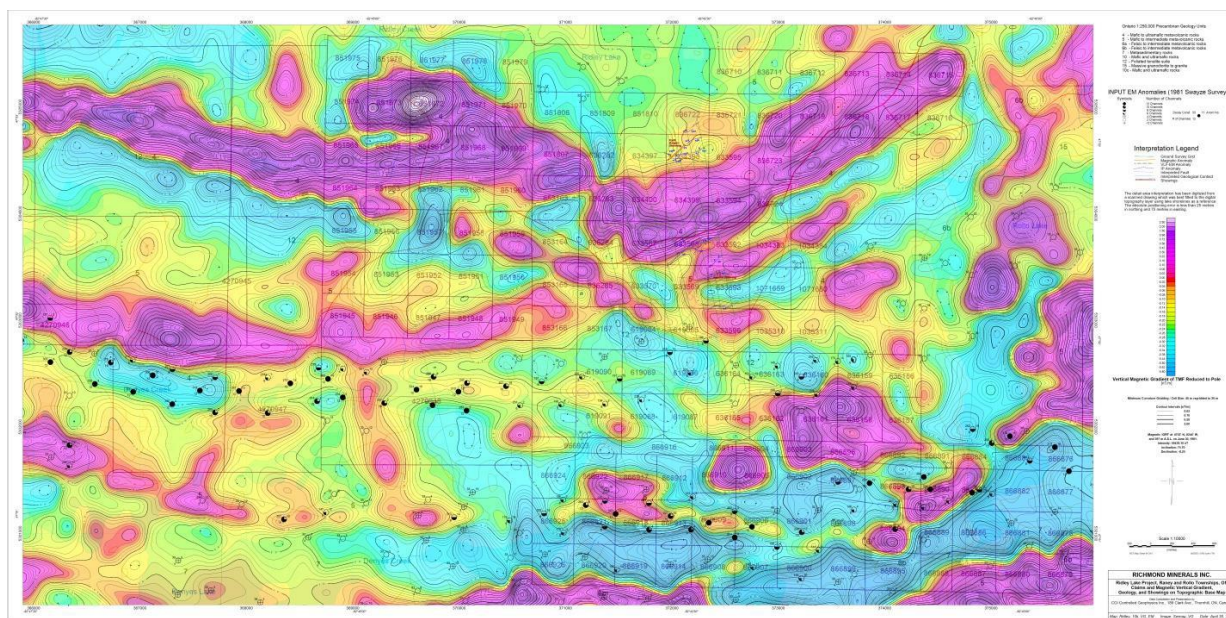
Bowman, M., 1983  
Postings and Contours of Total Magnetic Field  
Postings and Profiles of In-phase and Quadrature Components (VLF-EM)  
Postings of Apparent Resistivities  
Posting and Contours of Apparent Chargeability  
Geology Map

Interpretation Map (2014)

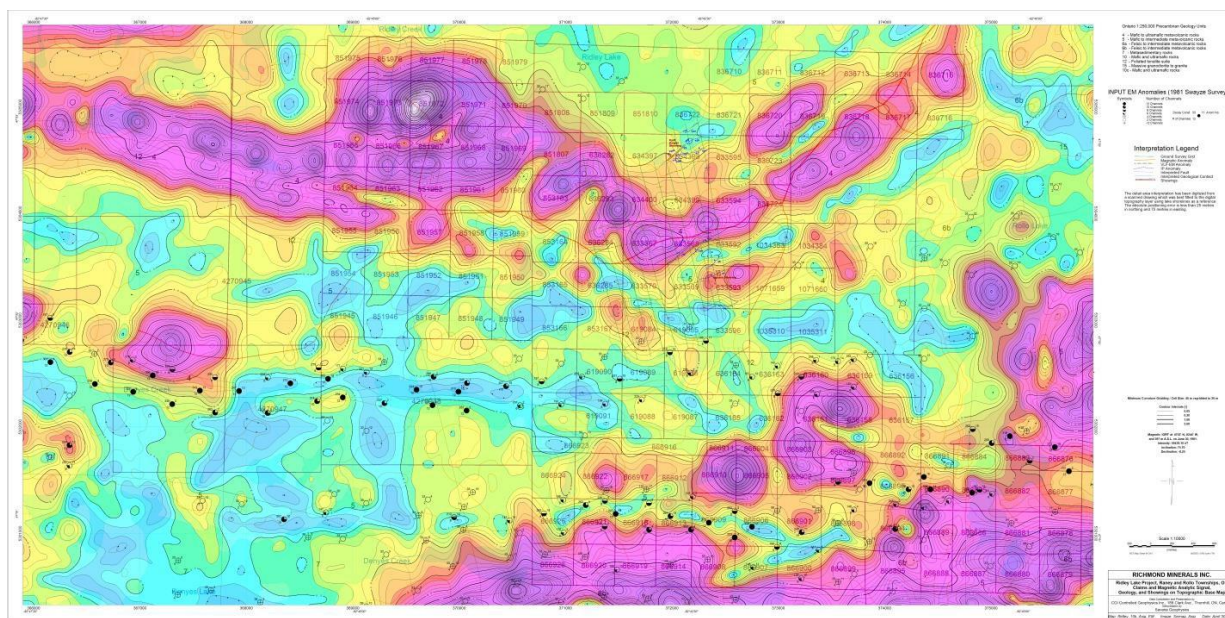


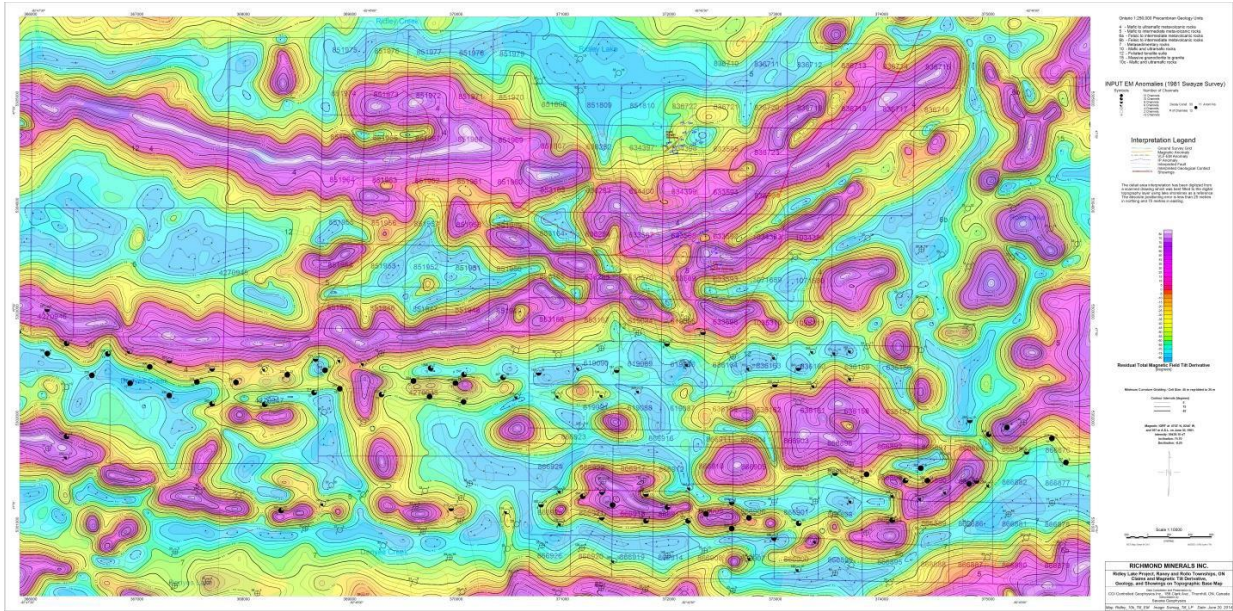




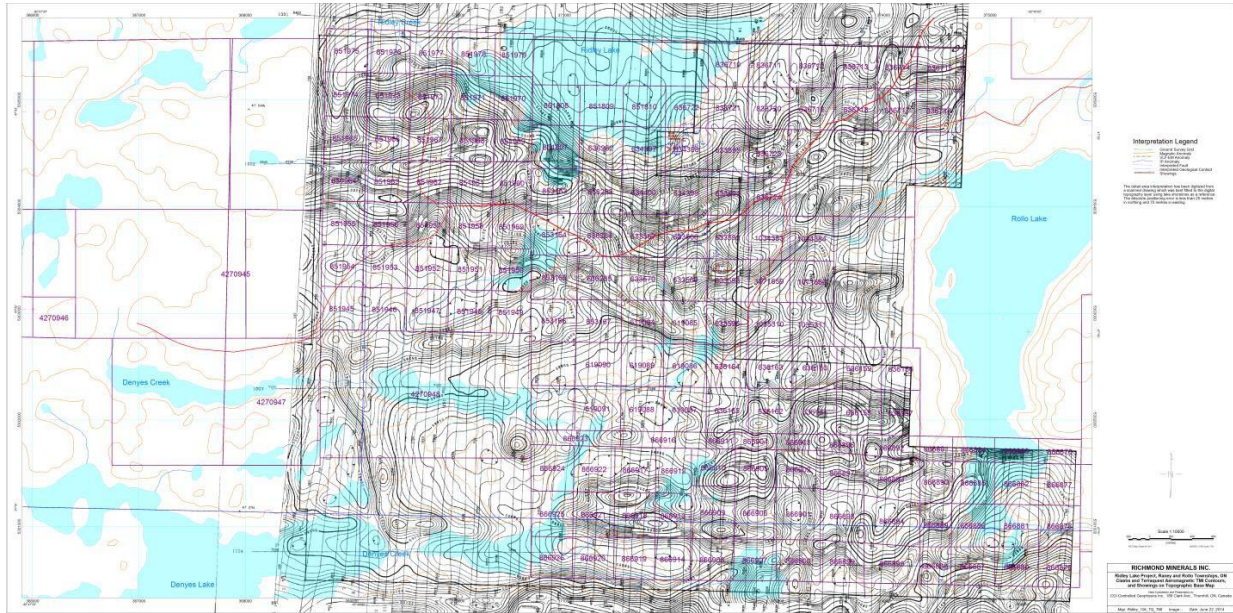


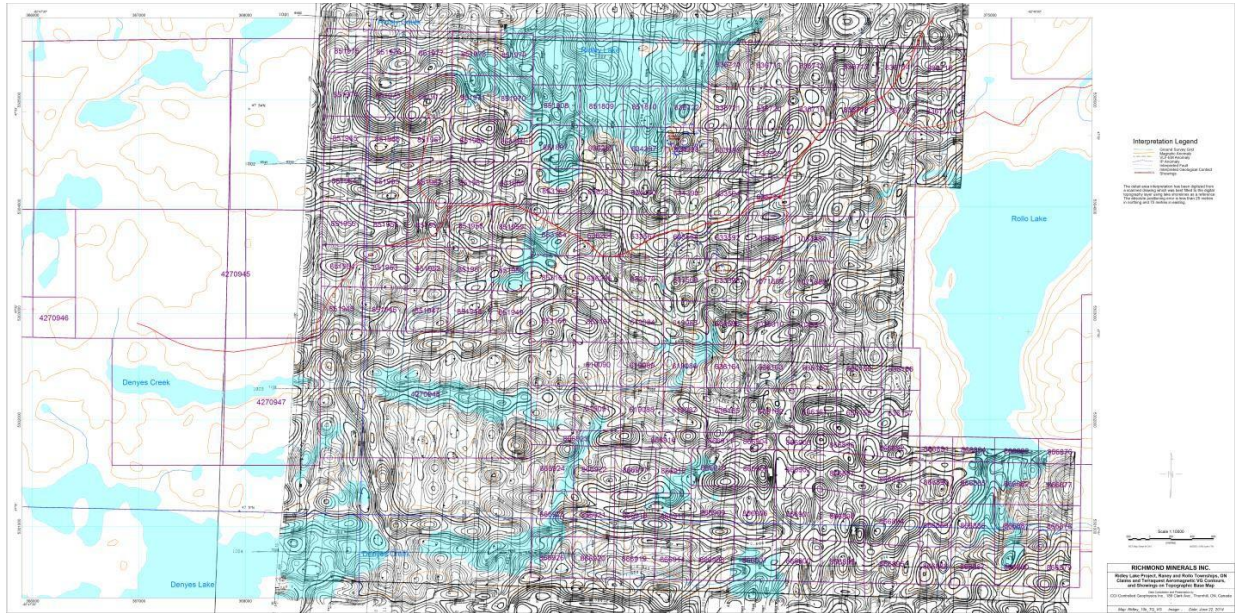


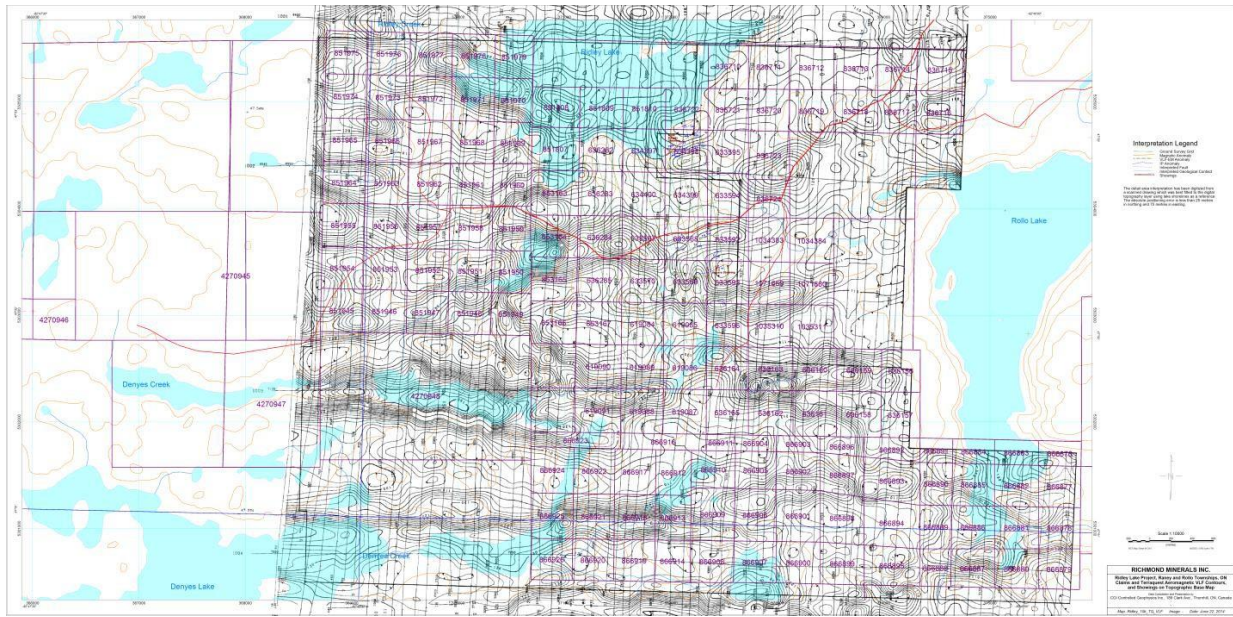




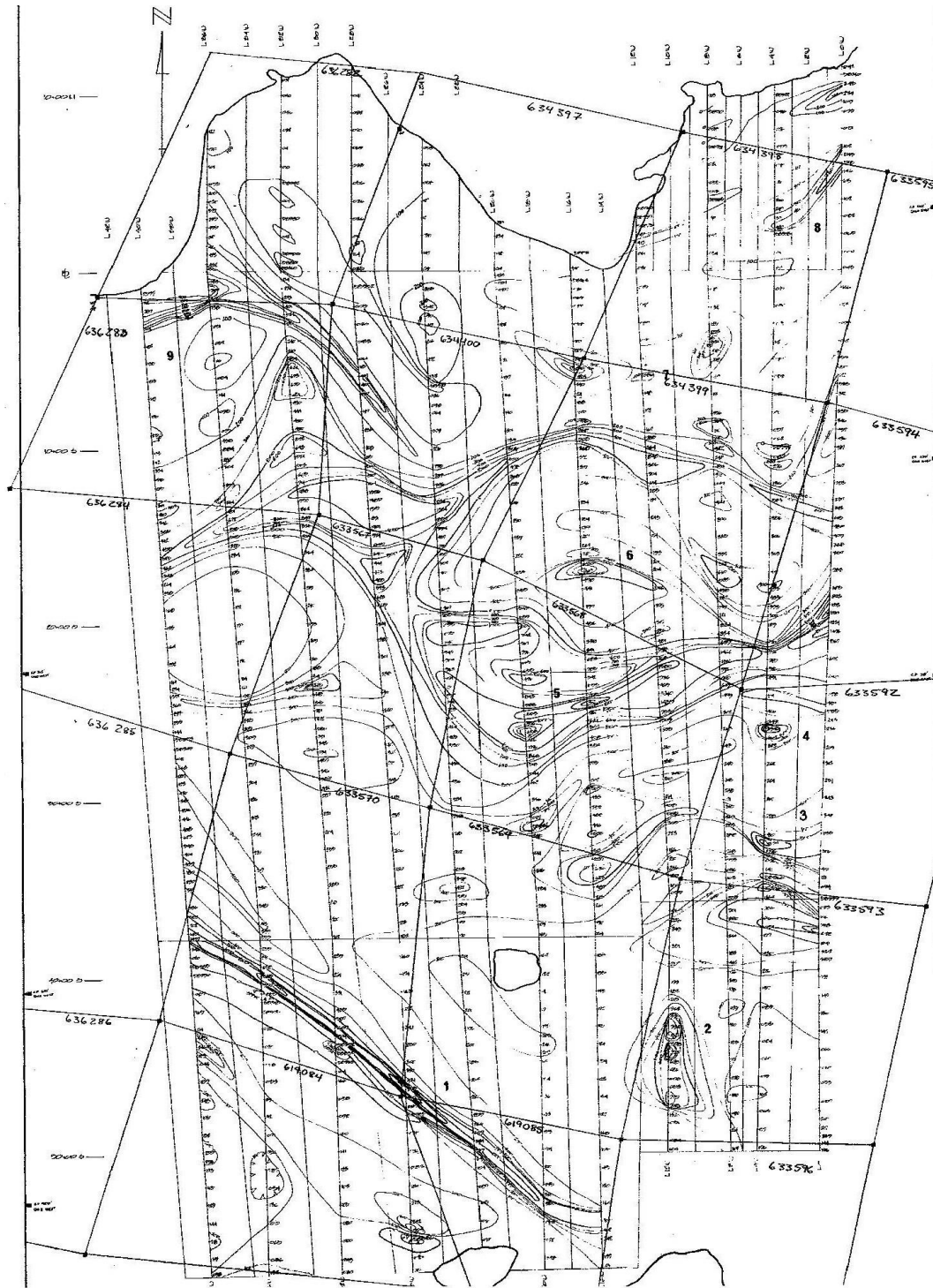




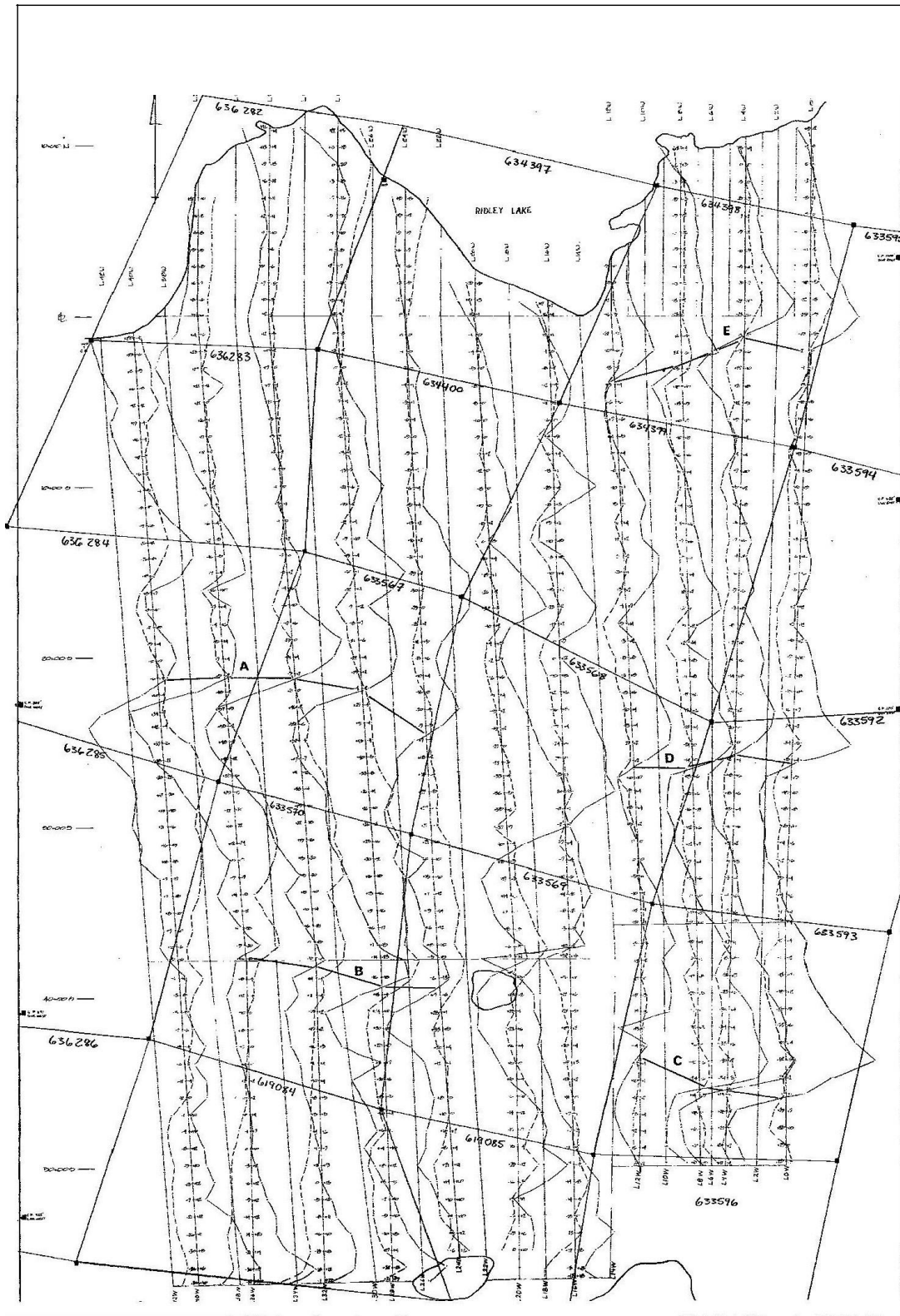


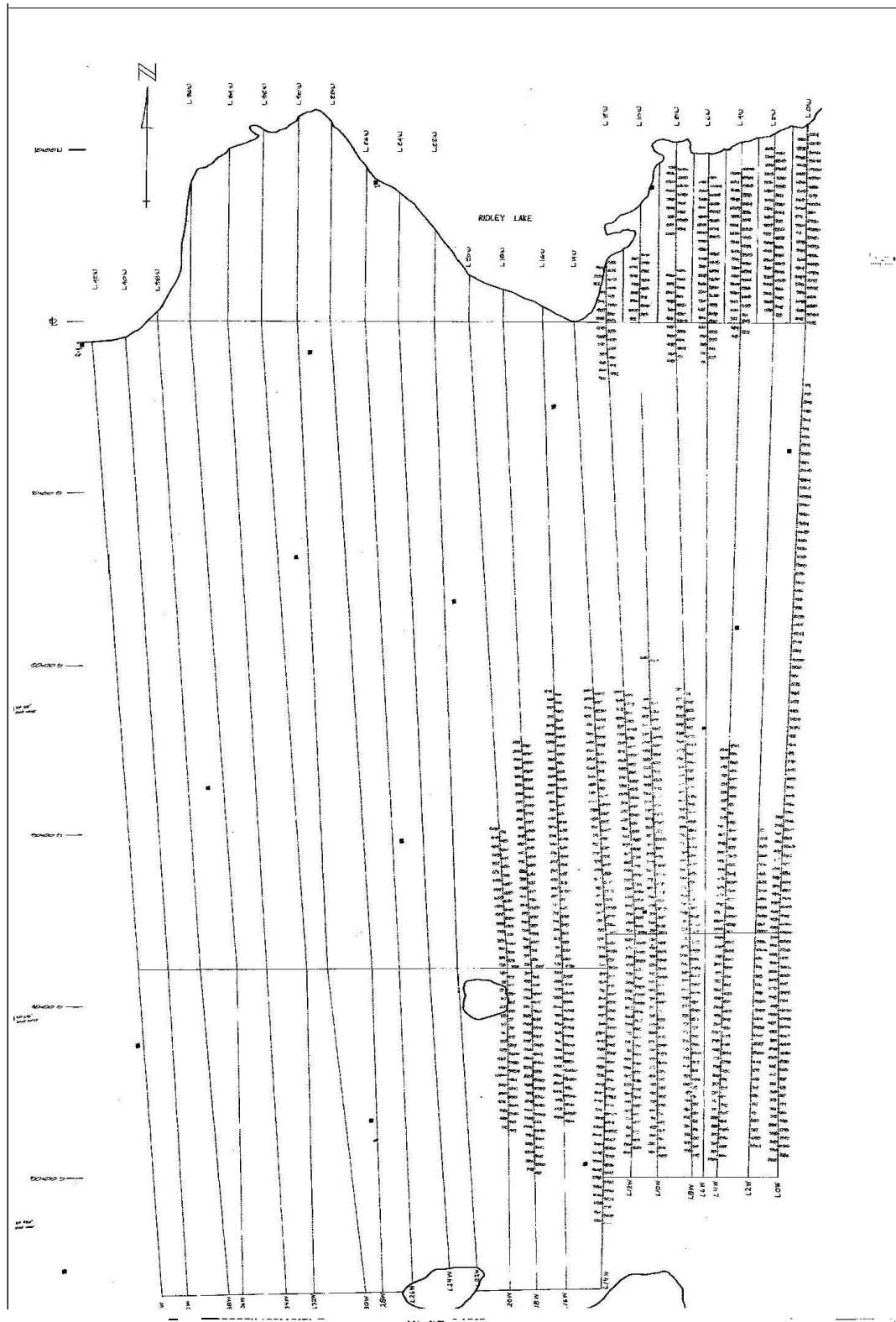


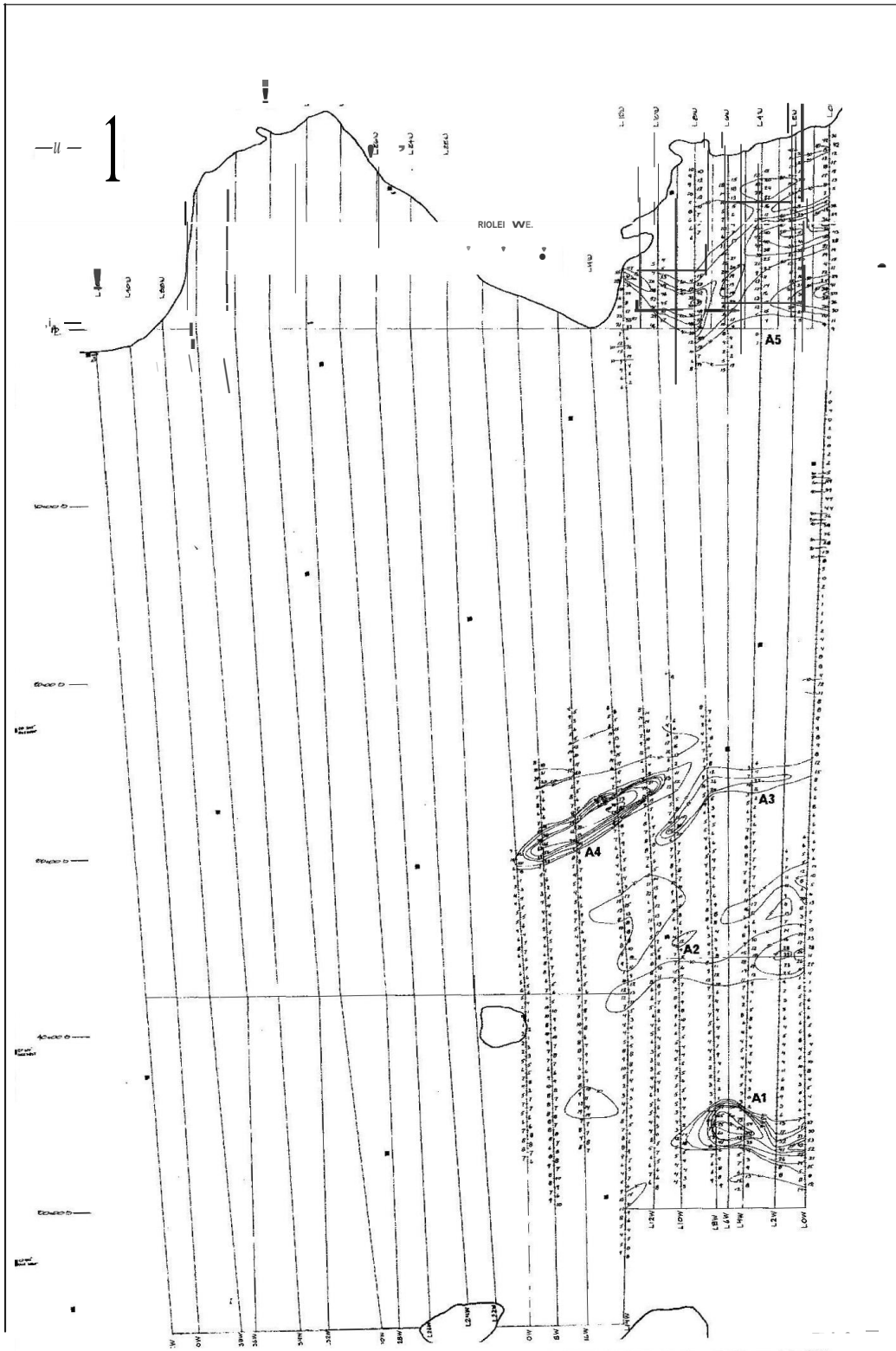


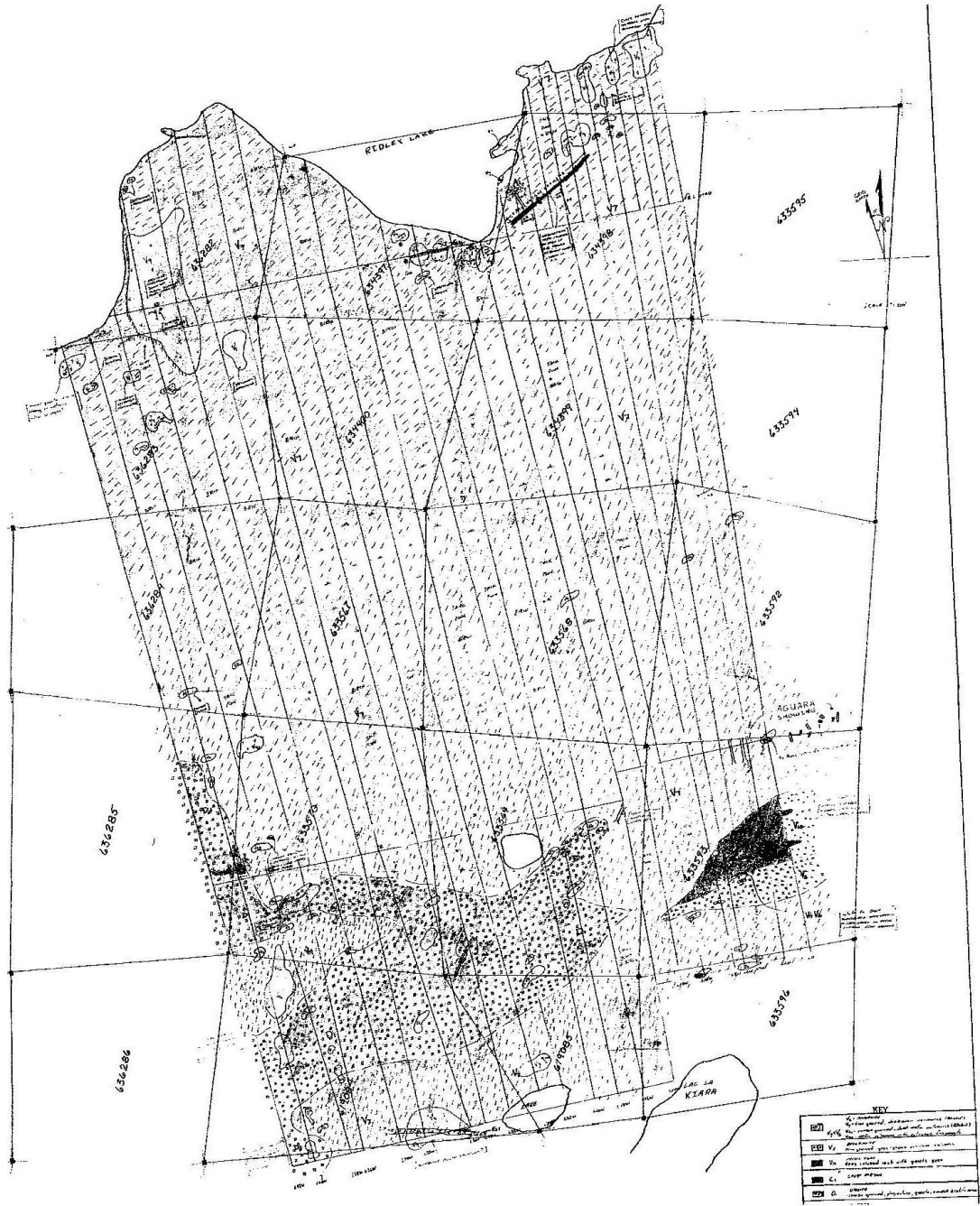
















**Legend**

- Approximate limit of magnetic domain with identification
- Approximate outline of magnetic bodies with identification
- "magnetic"
- "moderately magnetic"
- "slightly magnetic"
- Interpreted fault and/or shear zone with identification
- Diabase dyke
- Axis of VLF-EM conductor with identification (Teraquest)
- Approximate axis of INPUT conductor with identification (OGS, Swayze Survey 1991)
- Uncertain

**Ground Surveys**

- Ground survey grid
- IP anomalous trend
- Axis of ground VLF-EM conductor
- Ontario 1:250,000 Precambrian geology units
- Interpreted fault
- Showings

**Ontario 1:250,000 Precambrian Geology Units**

- 4 - Mafic to ultramafic metavolcanic rocks
- 5 - Mafic to intermediate metavolcanic rocks
- 6a - Felsic to intermediate metavolcanic rocks
- 6b - Felsic to intermediate metavolcanic rocks
- 7 - Metasedimentary rocks
- 10 - Mafic and ultramafic rocks
- 12 - Foliated tonalite suite
- 15 - Massive granodiorite to granite
- 10c - Mafic and ultramafic rocks

The detail area interpretation has been digitized from a scanned drawing which was best fitted to the digital topography layer using lake shorelines as a reference. Distances are in metres and less than 25 metres in north and 75 metres in easting.

To accompany report by Francis L. Jagodis, P. Eng.,  
Consulting Geophysicist

**Richmond Minerals Inc.**  
**Ridley Lake Project**  
Raney and Rollo Townships, Ontario

**Airborne Magnetic and VLF-EM Survey Interpretation Map**

October 2014

