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CANADA

CONTENTS

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INTRODUCTION

This report deals with work carried out February 4-26, 1966, on the A, B, C, MK and JAB Groups of mineral claims situated in the Mayo Lake-Keno Ladue River-Beaver River area, Mayo District, Yukon Territory. (Figure 1)

The claim groups are all owned solely by Arivaca Explorations Limited,(N.P.L.), with offices at 1111 - 736 Granville Street, Vancouver, British Columbia. The claims were located early in 1965 and were all recorded on February 26, 1965.

In mid-January the writer, acting as Consulting Engineer to Arivaca, was instructed to proceed immediately with exploration work on the claims, none of which had been worked on since location. The nature of the work to be carried out and the decision of whether to carry out work at that time or to make payments in lieu of representation work for Certificates of Work was left solely to the writer. The writer's decision was that an Electromagnetic Survey was both practical, in view of the prevailing winter conditions, and by far the most useful method of exploration which could be carried out at this stage of the investigation of all of the claim groups involved.

Geochemical maps published by the Geological Survey of Canada in 1965 (Mayo Lake, 18-1964, 19-1964 and Rackla River, 24-1964, 25-1964) showed anomalously high heavy metal contents in stream sediments and stream water on all of the five claim groups. These surveys were, as a consequence of the very large areas investigated, of a reconnaissance nature with individual samples taken at intervals along the larger streams and, usually, only near the mouths of minor watercourses. The geochemical results evident on all of the claim groups, while not sufficiently detailed to pinpoint targets for such costly exploratory methods as trenching or drilling, were sufficiently conclusive to provide ample justification for substatial exploratory effort.

The Electromagnetic Survey has been widely and successfully used throughout the metalliferous regions of the wold and particulaly so in Canada. It consists of detecting the electromagnetic fields generated by zones in the earth of higher than normal electrical conductivity and is simple and reasonably direct. Sulphide-bearing zones are generally strong conductors but are by no means exclusive in this sense. Comparable conductivities are exhibited by zones containing high contents of graphite or other conductive minerals and by certain ground-water conditions. Hence the method is aimed at detecting conductors and the significance of any conductor so demonstrated is dependent largely upon other evidence of the presence of metals or graphite.

With the direct evidence of heavy metals (lead, zinc and copper) in stream sediments and water on the claims, the existence of high conductivities coincidental with then could only be considered as very strong evidence of significant concentrations of base metals in such localities. It was on this basis that the Electromagnetic method was chosen. In addition, veins of the types in the Elsa-Keno area are characteristically strong conductors and it was reasonable to expect mineral deposits on the groups involved of a similar nature, as opposed to deposits of another type.

The work was planned to commence in the last week of January, 1966, however severe sub-zero temperatures precluded safe helicopter operation and a full week was forfeited before milder weather permitted flying. The basic Electromagnetic reconnaissance was carried out from the helicopter and served to delineate areas of high conductivity. Subsequently, where possible and permitted by the time available detailed measurements were taken using the ground instruments. Some additional time was lost due to weather conditions. While funds were available for much more detailed work, winter conditions result in higher than normal costs so work was discontinued on the claims after February 26th.

Prior to actual surveying of any given group, claim corners were flagged to provide adequate visual location control. This work was carried out principally during the period February 4-10, by I. A. Turnbull, Mining Engineer, an employee on the writer's staff.

The geology of the areas of all of the claim groups has been published by the Geological Survey of Canada, Map. No. 5-1956 by L. H. Green for C and MK Groups, and Paper 62-7 by L. H. Green and J. A. Roddick for A,B and JAB Groups. (Map No. 15-1962). The writer examined all of the groups thoroughly from the helicopter, however snow conditions precluded any detailed ground examination. As far as known, no sampling or any other prospecting has been done on any of the groups in recent years.

PART 1

GEOPHYSICAL SURVEY

INTRODUCTION:

The group of claims is located northeast and southeast of Keno Hill in the Mayo District of the Yukon Territories. (See Index Map) The general geographical location is 64° north latitude and 135° west longtitude. The C group is located north of the Ladue River. The MK group is situated south of the shore of Mayo Lake. The JAB group is south of Beaver River and the A and B groups are located relatively near to each other on the north east side of Beaver River and southeast of the Racla River.

The largest group is the JAB group which consists of 72 claims, 6 claims wide and 12 claims long. The next largest group is the MK group which consists of 32 claims, 4 claims wide and 8 claims long. The A and B groups are each 16 claims in size and they extend one claim on either side of creeks. Group C contains 16 claims, 4 wide and 4 long. 16

This electromagnetic air supported survey was accomplished to find suitable conductors which might denote mineralization. The author was aware of the presence of graphitic schists in the sedimentary complex. Experience has shown that this type of survey is selective enough to separate out primary conductors due to the sulphide mineralization and those secondary conductors which denote only structural effects.

WORK SUMMARY:

The personnel involved in this survey consisted of a geophysicist, C. R. Selmser, P. Eng. and Ian Poyntz, observer, who used the instrument and flew in the heliocopter which was involved in the survey. For the ground support which followed the airborne survey, casual personnel were used to hold the transmitter coil.

The geophysical survey was commenced February 9, with tests on the aircraft and in the area in order to test out the effects of the electromagnetic instrument. These tests involved the aircraft itself and typical ore bodies in the area.

On the afternoon of the 10th the survey was started on the MK group. February 11 and 13 were spent on the C group. A and B groups were surveyed on Feb. 14th. These were then finished on Feb. 17th. The JAB group was surveyed on Feb. 15, the afternoon of Feb. 16, and Feb. 18 and 19. More survey work was done on the MK group on the morning of Feb. 16 and also on Feb. 24. Additional work was done on the AB groups on the 25th of Feb. Additional work was done on the JAB group on Feb. 26. There was standby time on the 14, the 21st, the 22nd and the 23rd because of weather conditions.

ELECTROMAGNETIC METHOD:

The use of the Electromagnetic method for the detection of subsurface conductors including base metal Sulphide ore bodies is well established and accepted. The fundamental principal on which these methods are based could be described as a conductor placed in an audio frequency alternating magnetic field where secondary currents have been caused to flow. These secondary currents set up a secondary field, which distorts the original field. All electromagnetic methods detect the presence of a subsurface conductor by measuring the distortion of the resultant transmitted field.

The electromagnetic unit used in this survey was an SE250 instrument manufactured by E. J. Sharp Instruments of Canada, Limited. This unit was designed to give greater separation and deeper penetration than any similar battery operated portable EM unit. A standard frequency of 1000 cycles per second is used and since the primary signal is pulsating it can be readily distinguished from any background noise.

The areas were flown with a separation of 100 to 250 feet between lines. (See lines on geophysical maps.) The instrument used was flown as close to the terrain as the flying conditions would allow. The theory of the practice of this type of flying will be found in a section of the Addendum. Measurements were made during flight by observing the amplitude and tonal effects of the signal from the airship itself.

Exact measurements were made on the ground at locations that had been demarked previously by the airborne part of the survey.

GENERAL GEOLOGY AND PHYSIOGRAPHY:

The data used in this discussion was derived from maps and reports regarding the geology of the Mayo District. As shown on the map 890A for the Mayo District by the Department of Mines and Resources, Geology Branch, the rocks around Keno Hill consist of lenses of diorite or gabbro of Devonion or later age included in quartzite or schists of Precambrian and/or Paeleozoic age. Anticlinal structures in the sedimentary series provide ore bodies which are rich in silver and lead and occur as veins in Keno and Galena Hills. Mining has been concentrated in that part of the map area lying north and west of the southeast end of Mayo Lake, and adjacent parts to the north and west of the map areas.

The MK group consists for the most part of grey and blue grey blocky quartzite with some minor graphitic phyllite with greenstone and serpentinized gabbro lenses. The formation strikes east and west and dips south at 30 degrees. The centre of the C group is occupied by the same formation and these formations are bordered by quartz pebbled greywackes. The formations strike southwest to northeast and dip 41° towards the southeast. Near the centre of the group a fault crosses the formation in a northwest to southeast direction.

On the surface there are Kame Terraces in the northwest corner of the group. The bedrock of A and B and JAB groups consists primarily of argillite, slates and phyllites. The formations strike northwest and southeast and dip 55° towards the northeast. Some lenses of weathering diorite and gabbro are included in these rocks.

MK, A and B groups are situated in the proximity of stream valleys. The C and the JAB groups occupy the summits of hogback structures with the dip slope towards the south and with sheer canyon walls towards the north. The elevations vary from 3000 to more than 5000 feet in elevation above sea level.

ELECTROMAGNETIC GEOPHYSICAL MAPS:

Three principal anomalies were discovered in the C group. These occupy the following claims: C16 in the southwest corner with the conductor trending northeast and southwest; C14 in the northeast corner with the conductor trending northeast and southwest; C3 in the northwest corner with conductors trending towards the northeast and southeast.

The MK group has anomalies as follows: MK31 with an anomaly in the northeast corner; MK15 with an anomaly in the southwest corner;

MK29 with an anomaly in the southeast corner; MK25 with an anomaly in the northeast corner; MK3 with an anomaly in the northeast corner. None of these anomalies could be measured on the ground since the area is heavily forrested.

The A group has anomalous areas as follows: A2 in the southeast corner and also east of the boundary; A9 in the north central section of the claim.

B group has anomalies as follows: B2 in the southeast corner and B4 in the east central portion.

The JAB group, the largest of all the groups, has the most anomalies and is considered the most important group in this area. The anomalies in this group are as follows: JAB9 with an anomaly in the southeast corner; JAB7, also with an anomaly in the southeast corner; JAB11 with an anomaly in the northeast corner; JAB2 with an anomaly on the south boundary; JAB4 with anomalies in the southeast corner; JAB10 with an anomaly in the southwest corner; JAB13 has an anomaly in the southeast dorner; JAB17 has an anomaly in the northwest corner; JAB14 with an anomaly on the east boundary; JAB22 with an anomaly in the southeast corner; JAB24 with an anomaly in the southeast corner; JAB27 with an anomaly in the northwest corner; JAB26 with an anomaly in the southeast corner; JAB28 with an anomaly in the east central portion; JAB34 with an anomaly in the northeast sector; JAB36 with an anomaly in the southeast sector; JAB45 with an anomaly on the southeast boundary; JAB55 with an anomaly in the southwest corner; JAB59 with an anomaly on the west boundary; JAB 52 with an anomaly in the west half of the claim; JAB58 with an anomaly in the southern portion; JAB61 with an anomaly in the southeast quarter and JAB67 with an anomaly in the north portion.

The anomaly in JAB13, 15 and 17 has very good promise and trends in a north to south direction. This seems to be the predominant direction of strike for conductors in this area. This direction is of course normal to the direction of strike of the bedding with the exception of the conductors contained in JAB16 and JAB52. The anomalies contained in JAB58 and JAB67 are also considered to be representative conductors which may be deposits of sulphide or silver and lead deposits. The conductors found in the C group are aligned more or less with the strike of the formations and are of a secondary nature. These could well be caused by the presence of graphitic phyllites. The anomaly dips on claims 3 and 4 were about 10° to the right. These show more representative and clearcut values than the anomalies of the other claims in the group. On A group the most definite signal came from claim #9. On B group claim B4 gave a particularly strong signal.

CONCLUSION:

The principal locations for further investigation are those mentioned for the JAB group, the A and B groups and the MK groups. The anomalies calling for the most intensive work are those as follows: Claims 3 and 4 in the MK group, Claim 9 on the A group and claim 4 on the B group. Claims 13, 15 and 17 of the JAB group and also claims 58 and 67 on the JAB group.

It is felt that although the airborne part of the survey has definite limitations as to depth of penetration, a thorough coverage of the areas has been done. This of course is with reservations for deep moraine material and steep slopes in the higher areas. This investigation will enable the client to concentrate his effort in sectors where the most benefit may be derived with the least amount of money expended.

RECOMMENDATIONS:

It is not recommended that any further geophysical investigation be made at this time of these properties. Time in the coming field season should be employed in detailed geology on the sectors calling for further investigation. The outcome of this ground work will dictate what further physical exploitation is necessary.

Respectfully submitted,

GEO CAL LIMITED

C. B. Selmser

C. B. Selmser, P. Eng.

ADDENDUM

Reference in this report will be made to Paper 62-7, Dawson, Larsen Creek and Nash Creek Map-Areas, Yukon Territory by L. H. Green and J. A. Roddick.

During the time of the survey a special investigation was made over known ore bodies near Elsa [redacted], specifically the Peso-Rex ore body. Also the Onek body was investigated which is situated near Keno. [redacted] These investigations proved that the technique was a plausible one and definitely suited for finding ore bodies of this nature in this region. The areas are demarked by the tonal and amplitude changes of the signal from the aircraft and the secondary field from the conductor and coincided exactly with the positions of the respective ore bodies.

1. Primary Field from rotor blades of a 47G-3B-1 Bell Heliocopter.
2. Certificate of Qualifications of the Author.

PRIMARY FIELD FROM ROTOR BLADES OF A 47G-3B-1 BELL HELIOCOPTER

INTRODUCTION:

The author while making installation tests on a 47G-3B-1 Bell heliocopter discovered an interesting primary field developed by the rotors on this aircraft. It was found that this field is adequate for searching near the surface of the ground with an operator using an electromagnetic search coil.

This primary field has an effective size to reach at least 150 feet below the elevation of the search coil. It also has an approximate frequency of 100 cycles per second, which provides maximum penetration into overburden and rock material to a depth of about 100 feet.

Search is made in mountain country by flying lines along contour levels and on more level terrain with a pprallel configuration. With the aircraft at a 50 to 75 foot elevation above the terrain the path covered is about 100 feet wide.

PRACTICAL THEORY:

A careful examination of figures 1 and 2 will show that because of the shape of the rotor blades on the aircraft, two distinctive fields are generated when the rotor is turning. These fields are generated from eddy currents in the rotors as they turn rapidly across the earth's magnetic field, which in northern latitudes is nearly vertical to the earth's surface.

An elementary study of physics tells us that a conductor cutting across a magnetic field will generate electric current. If this current is not drawn off then eddy currents will form and a secondary field which has a frequency depending on the speed of the rotors will be developed.

Since the two blades are turning and will reach opposite sides of the shaft, the currents and thus the field will be changing direction with every revolution of a blade. The blades rotate at a speed of 3020 R.P.M. and since there are two blades the primary rotor field has a frequency of approximately 100 cycles per second.

The blades which are made of alluminum alloy are long and thin. This shape promotes a rotor field, which is normal to the flat surface of the blade. As the blade turns, the field which is effectively about 150 feet in radius, forms a conicle shape. A second field is built up transverse to the rotor field. This field as it turns with the blades forms a sphere shaped configuration.

When the rotor field comes in contact with a tabular ore body it sets up a secondary field from the conducting ore body. This field then joins the transverse field to give a resultant field direction that is quite different from the original and now no longer perpendicular to the axis of the search coil.

THE DETECTOR COIL:

The operator sits in the seat beside the pilot and holds a search coil with its axis vertical. Attached to the tuned coil is an audio amplifier. This is in turn attached to a pair of head phones, which the operator wears over his ears.

The audio amplifier, which is tuned to a signal of 100 C.P.S. has a gain switch and a feed back squelcher switch. The gain switch is regulated so that the signal is just audible when the coil is held with its axis vertical. The squelcher circuit is adjusted so that only the 100 C.P.S. signal goes through the amplifier.

When the aircraft is flown close to the surface of the ground without a conductor present the field signal will have minimum amplitude. When a conductor is present in the rotor field the signal strength will suddenly increase in amplitude warning the operator that he is crossing a conductor. The aircraft then hovers over the spot until the observer has investigated the change in orientation.

TESTS MADE IN THE FIELD:

(1) Tests were made for extraneous fields inside and outside of the aircraft.
(2) Tests were made of the rotor and transverse fields inside and outside the bubble.
(3) The aircraft was flown at various elevations over the observer so that he could measure the amplitude of the rotor field at the various levels.
(4) A known external field was mounted below the rotor using a motor generator set for power. Tests were made both on the ground and in the aircraft, and while the aircraft was airborne. This enabled the author to study the relative strength of the magnetic field.
(5) Tests flown over Keno Hill ore bodies gave positive verification with orientation changes of 10 degrees.

CONCLUSION:

The primary field generated by the 47G-3B-1 Bell aircraft may be used for reconnaissance electromagnetic surveys. The search is not as deep as some ground methods, but is deep enough for bodies exposed in outcrops or under light overburden. The method is as effective for finding conductors as the self potential method, but with greater speed and mobility.

It is obvious that since the method can be used in an aircraft such as this it is very adaptable to surveys over all kinds of terrain. The survey requires no line cutting and coverage may be done rapidly and with as much detail as required.

COST RELATIVE TO GROUND METHODS:

The survey which is continuous in nature may be flown at a cost of $12.50 per mile. Surveys on the ground could cost as much as $100.00 per mile in very rough and inaccessible locations.

The cost of the aircraft, which in most cases amounts to $3.00 per mile is much less than that for line cutting. Line cutting and marking costs usually $40.00 per mile.

The total cost of the survey then is $15.50 per mile. This means that the claim is totally covered with continuous reading on lines 100 feet apart. The equivalent cost on the ground would be $250.00 with readings 100 feet apart and lines having a 200 foot separation.

Respectfully submitted,

GEO CAL LIMITED
C. B. Selmser
C. B. Selmser, P. Eng.

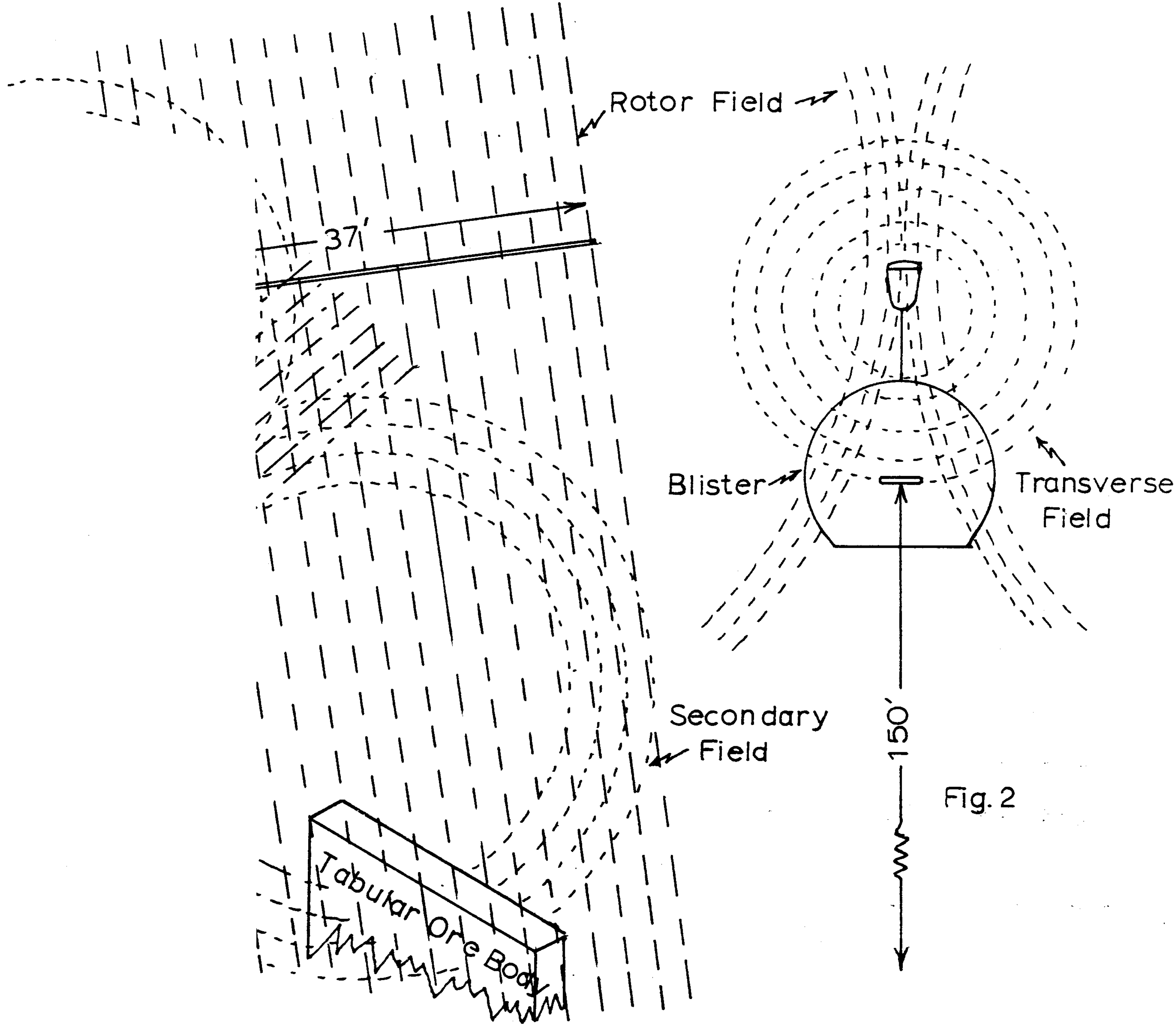

Rotor Field
37'
Blister
Transverse
Field
Secondary
Field
150'
Tabular Ore Body

Fig. 2

CERTIFICATE OF QUALIFICATIONS

The formal education of Mr. Calbert B. Salmser, P. Eng. consists of undergraduate studies at Union College, Schenectady, N.Y., in engineering and science leading to a B. Sc. degree; Graduate studies at McGill University, Montreal, P. Q., in mining geology were carried out leading to a M. Sc. degree. Also included in graduate study was a year spent at the University of Toronto in the physics department doing graduate study in mining geophysics.

The author has had extensive experience in exploration work in the provinces of Quebec, Ontario, Manitoba, Saskatchewan, Alberta and British Columbia in Canada. He has also worked as a Field Engineer and Geophysicist for International Nickle Company in the Transvaal region of South Africa.

The author has been a member of the Association of Professional Engineers of Ontario and Alberta for a period of 15 years. He is at present an active member of the Association of Professional Engineers of British Columbia, and is a resident engineer operating in this Province.

My knowledge of the property outlined in this report has been gained by an interpretation of government survey sheets and paper 62-7. I have also observed the property from the air and interpreted all data received from the electromagnetic observer.

The author has no financial interest in the property examined. He is acting wholly as a consultant to the interested principal. The only commercial gain derived by this report by the author is for his specific professional services.

C.B. Selmser

C. B. Salmser, P. Eng.

PART II

ENGINEERING EVALUATION

Geophysical Results

In his report, C. B. Selmser, P.Eng., listed the conductive zones found on the various claim groups, has interpreted the ground readings and plotted the results on the enclosed maps, figures 2,3,4,5,6. He also commented briefly on the geology of the various groups. Many conductive anomalies were found on the claims by the airborne reconnaissance and a number were detailed by ground measurements as far as time and terrain allowed. It is significant in evaluating those on which the detailed ground work stage was not reached, that all other conductors located from the air responded positively when followed up by ground measurements. Conductivities vary considerably in intensity from one anomaly to another.

The following discussion relates briefly the significance of anomalies as related to geology and geochemistry.

1) A Group

Two conductive anomalies were found from the helicopter but terrain and tree cover precluded ground measurements. The rocks are closely cleaved, steep dipping, commonly graphitic sediments (probably mainly argillaceous) mapped as Post-Devonian(?) Close to the northeast is a chain of small plugs mapped as diorite or gabbro. Geochemical readings are moderate in the vicinity of the anomaly on A1 and A2 but are a little higher in the vicinity of the anomoly on A9.

2) B Group

Two anomalies were found, on B2 and B4. The rocks are similar to those of A group, however, there is a fairly large intrusive plug very close to the east. The metal content of spring and stream water is very high coincident with the anomoly on B2.

3) C Group

Three anomalies were found with the helicopter and detailed out on the ground. The rocks are mapped as mainly Precambrian (?)quartzites with a few small, sill-like bodies of serpentinized gabbro. The geochemistry shows no high readings attributable to the area of the claims. The anomalies on C14,C15 and C16 appear to be related to bedding, are of fairly low intensity and suggest, by orientation parellel to bedding, that they may be related to graphitic rocks. The anomaly on C12 and C3 is coincident with a small gabbro body. The conductivity, however is high and the significance of this anomaly is uncertain.

4) MK Groups

Five conductors were found with the helicopter but lack of suitable landing locations precluded ground detailing. The rocks are mapped as Precambrian(?) quartzites similar to those of C Group but with many large sill-like bodies of greenstone. The metal content of water in Edmonton Creek is considerably higher than on other (and smaller) creeks in the vicinity. A placer gold occurance is recorded on ~~ON~~ MK 13. The anomalies on MK 3 and MK 15 coincides with somewhat higher stream water and sediment metal contents and this is significant. Both are in the sedimentary rocks. The three anomalies on MK 25 to MK 31 appear to line-up across the bedding. On MK 31 the anomaly is in sediments, and is of weak intensity. The anomaly on MK 25 appears to be on a greenstone body while that on MK 29 may be on greenstone or sediments. The three could be related but this is uncertain.

5) JAB Groups

In total 24 conductive anomalies were found on the JAB claims. Time and terrain permitted detailed ground investigation of six of these, three in the northwest region and three in the southwest region of the claims. It is worthy of note that some anomalies not yet detailed may be of equal importance. The rocks of JAB group are mapped as Post-Devonian(?) sedimentary rocks, the same unit as those of A and B Groups. These sediments are principally argillite, slate and phyllite, are reported to be commonly graphitic, strike northwest and dip at about 55° to the east. Three fairly large bodies of diorite or gabbro form a north- trending chain along the north-west portion of the claims. The anomalies of JAB 15, 16 and 17 coincide roughly with these bodies and appear to be related to them. They are strongly conductive, and all lie on the top of the ridge. The geochemistry on the drainage to the northeast is very,

very strong with unusually high stream water metal contents. However, the drainage to the southwest and west shows very low readings and this tends to disprove significant base metals in at least those anomalies right on the crest of the ridge. On the other hand, the anomalies on JAB 7-11 are situated on the head of a stream which at its mouth contained 2.5 PPM of heavy metals, an extremely high figure. These anomalies then, appear of prime significance.

The anomalies on JAB 58 and 67 cross the bedding and coincide with very high stream water metal contents which drain the vicinity on which they are situated. These also appear of prime significance. While the anomoly on JAB 52 is conformable with the strike of the sediments it lies immediately above a creek in which the water contains extremely high metal contents of 1.1 and 2.2 PPM. This anomaly must also be considered of prime importance.

Various of the undetailed anomalies found on JAB 55,57,58 and 59 coincide with very high stream water metal contents and must be considered also as of prime importance. This also applies to the anomalies on JAB 22, 24, 34 and 36.

All streams flowing northeast on the JAB claims exhibit high metal contents in stream sediments as well as stream water.

Summary

The electromagnetic anomalies found on the five claim groups have in many instances coincided with previously known geochemical anomalies. In these cases the anomalies must be considered as very promising of carrying significant sulphide mineralization. This is particularly true of the majority of the anomalies on the JAB and B Groups and of two of the anomalies on the MK claims.

In many cases Electromagnetic anomalies have coincided with geological features such as igneous bodies and in some cases possibly highly graphitic rocks.

This appears to be the case with those of the C Group and some of those of the MK Group. In these cases, if geochemical anomalies are absent, the Electromagnetic anomalies must be considered as not particularly promising. They do, however, justify some further investigation.

The geochemical anomalies of A,B,MK and JAB Groups are better understood when considered in the context of those resulting from known metalliferous veins of the Elsa-Keno mining area. Firstly, the heavy metal contents shown on the Geological Survey of Canada maps are reported to be principally the total of lead, zinc, and copper in the stream sediments and stream waters. In the Elsa-Keno area stream sediments contain high contents while stream water contents are usually low. This conditionsis associated with what are principally, lead-zinc-silver veins. Copper is generally deficient.

The geochemistry of the MK group is basically similar to that prevalent in the Elsa-Keno area. However, the geochemistry of JAB and B Groups (and this might also apply to A) is markedly different. While the metal in stream sediments on JAB and B Groups is comparable with that in the Elsa-Keno area, the metal content of stream water is very, very much higher, of the general order of 20 to 100 times as high. There is no direct evidence to explain this, however, it is the writer's opinion that this is suggestive of the possible predominance of copper over lead-zinc in the stream water in view of the higher water solubilities of copper sulphides. This would tend to explain the condition on JAB where despite extremely high readings in the water, the readings in the sediments are little higher than in some other creeks in the immediate area.

RELIABILITY OF THE WORK

The writer has no hesitation in declaring his belief that all of the work performed on the five claim groups was carried out in the best professional manner possible under the conditions that prevailed. The work is considered to be reliable and accurate within the method of ground control employed.

C. B. Selmser, P.Eng., is known by the writer to be both technically competent and reliable. His qualifications of education and practical experience in mining geophysics are excellent.

The writer had not known Ian Poynitz before, but extensive contact and technical dialogue during the course of the work yielded the satisfaction that he is a reliable and competent geophysical technician.

I. A. Turnbull, who established the ground control, has been continuously employed by the writer for over seven months and is known to be qualified, reliable and technically competent.

All work of a technical nature was performed by the three above mentioned gentlemen and the writer.

The writer is equally satisfied that airborne Electromagnetic reconnaissance employing the field generated by the aluminum helicopter blades on the type of aircraft used, is equally effective with methods employing a conventional transmitter coil. The results of the survey of the five claim groups, when compared with known geology and with the results using the ground equipment further verify this. At the request of department officials in Whitehorse, specific checks were made over both the Peso Rex vein and the Onek vein. In both cases a strong positive response was obtained from the helicopter.

VALUE OF THE WORK

The total cost of the geophysical survey including helicopter rentals, geophysical charges, professional fees and attendant expenses was $18,697 plus some incidental expense. The total applied for representation work is $18,200.

The writer is emphatic in concluding that Arivaca Explorations Ltd. have received excellent value for the cost involved. The geophysical survey has added a great deal of detailed knowledge of all the claim groups. It is now possible to direct subsequent exploratory work to promising targets of defined location and narrow dimensions and this was the prime necessity and main purpose of the work.

Respectfully submitted,

J. F. McIntyre, P.Eng.

CERTIFICATE OF QUALIFICATIONS

I, J. F. McIntyre, P.Eng., hereby declare that:

1) I hold a Degree of B.Sc. in Mining Engineering, University of Alberta, 1949; and,

2) I am a registered member in good standing of the Associations of Professional Engineers of British Columbia and Alberta; and,

3) I have practiced my profession continuously since 1949; and,

4) I have had broad and extensive experience in mining, both in production and exploration, in various provinces and territories of Canada, various states of the U.S.A. and in Taiwan. Included in my more recent mining experience were six years spent as an employee of the firm of Dolmage, Mason and Stewart Ltd., Vancouver, B. C., and one year in private consulting practice. Included in my previous relevant experience was four years in geophysics with Schlumberger Well Surveying Corporation and McCullogh Tool Company; and,

5) I have personally examined all of the claim groups referred to in this report in February, 1966; and

6) I have never nor do not own any interest in the claims referred to or in Arivaca Explorations Ltd.

Signed:

J. F. McIntyre, P.Eng.

PART III - ADDENDA

LIST OF PERSONNEL

J. F. McIntyre, P.Eng., Consulting Engineer
Ste. 407 - 475 Howe St., Vancouver 1, B. C.

C. B. Selmser, P.Eng., Consulting Geophysicist
2658 Nelson St., West Vancouver, B. C.

Ian Poyntz, Geophysical Technician
c/o 2658 Nelson St., West Vancouver, B. C.

I. A. Turnbull, Mining Engineer
Ste. 407 - 475 Howe St., Vancouver 1, B. C.

L. A. Davison, Pilot
Klondike Helicopter, Whitehorse, Yukon Territories

R. Gardner, Mechanic
Klondike Helicopters, Whitehorse, Yukon Territories

STATEMENT OF EXPENDITURES

SCHEDULE I - INVOICED EXPENDITURES

1) Klondike Helicopters Invoice - Mar2/65 66 hrs. 40 min. flying time	$ 9064.03
2) Geo Cal Limited Invoice - Feb15/66	2209.69
Invoice - Mar 5/66	3383.20
3) J. F. McIntyre - Invoice Mar10/66	4040.17
TOTAL EXPENDITURES	$18697.09

DISTRIBUTION OF EXPENDITURES

SCHEDULE 2 - Helicopter costs pro-rated on basis of work categories

Helicopter charges	$9064.00	(Klondike)
Vehicle rental-support	177.00	(J.F.McIntyre)
	$9241.00	

Ground Control flying @ 17%	$ 1571.00
Geophysical Survey flying @ 83%	7670.00

SCHEDULE 3 - Helicopter survey time pro-rated on basis of hours flown by groups.

Total cost per Sch. 2		$ 7670.00
A & B Groups	@ 20%	1534.00
C Group	@ 22%	1687.00
MK Group	@ 21%	1612.00
JAB Group	@ 37%	2837.00
Total		$ 7670.00

1609?

SCHEDULE 4 - All costs other than Sch. 3 pro-rated on basis of number of claims

Total cost by difference Sch.1-Sch.2

A & B Groups	@ 10		$ 1106.00
C Group	@ 9		993.00
MK Group	@ 15		1658.00
JAB Group	@ 66		7270.00
		Total	$11027.00

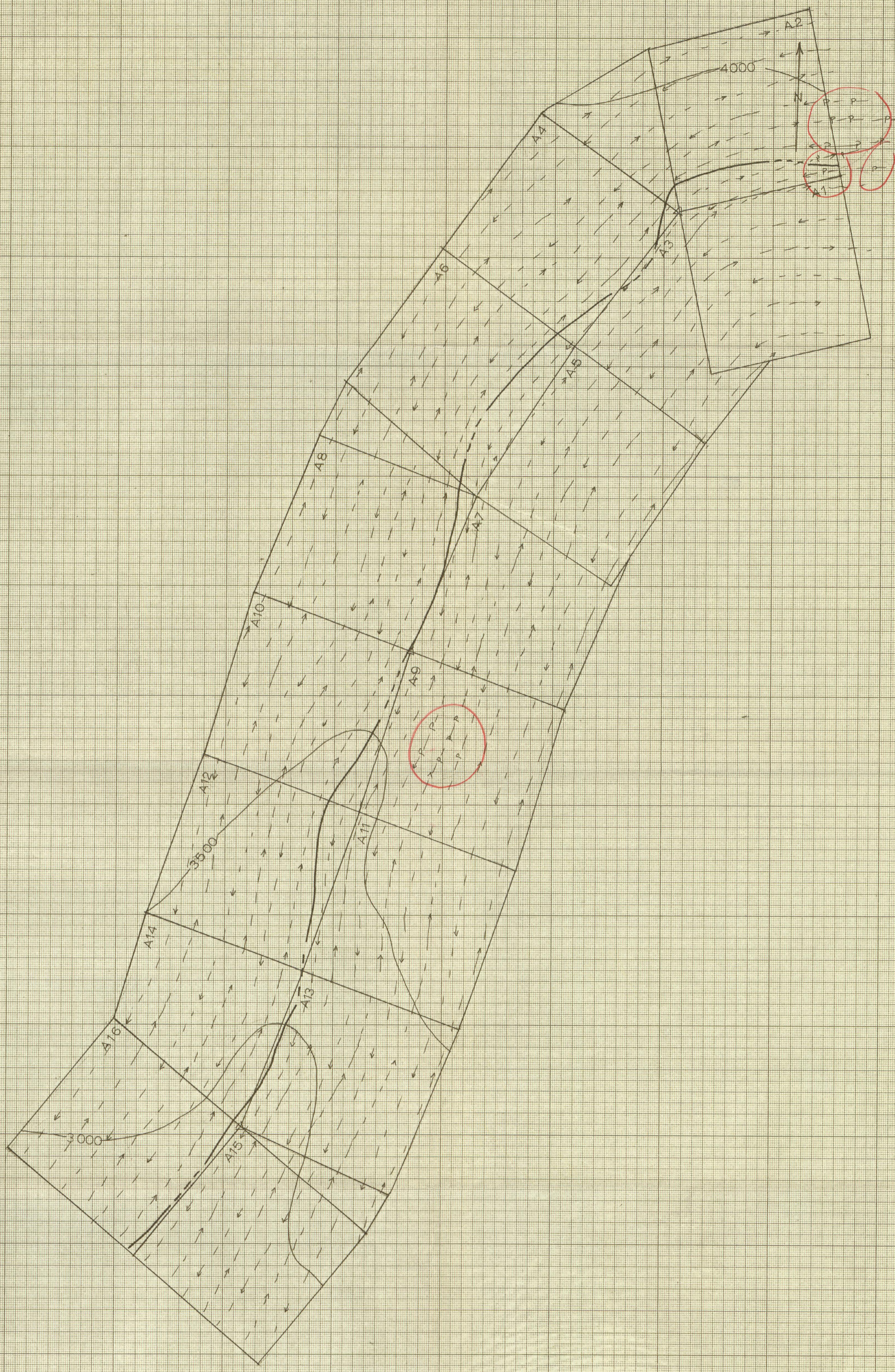
SCHEDULE 5 - Total expenditures by Groups

by summation of Sch. 3 & Sch. 4 $ 11,627.00

A & B Groups		$ 2640.00
C Group		2680.00
MK Group		3270.00
JAB Group		10107.00
	Total	$18697.00

SCHEDULE 6 - Total expenditures distributed per Sch. 5 according to applications for grouping and applications for Certificates of Work.

Grouping applied for				Total Expenditures
Marked A	@	60.0%		$ 1584.00
Marked B	@	40.0%		1056.00
Marked C	@	100.0%		2680.00
Marked MK N	@	62.5%		2043.00
Marked MK S	@	37.5%		1227.00
Marked JAB I	@	22.2%		2246.00
Marked JAB II	@	11.1%		1123.00
Marked JAB III	@	22.2%		2246.00
Marked JAB IV	@	22.2%		2246.00
Marked JAB V	@	22.2%		2246.00
			Total	$18697.00



ELECTROMAGNETIC GEOPHYSICAL MAP

Arivaca Explorations Ltd.
A Group
Mayo District

Scale: 1 in. = 500 ft. Feb. 25, 1966

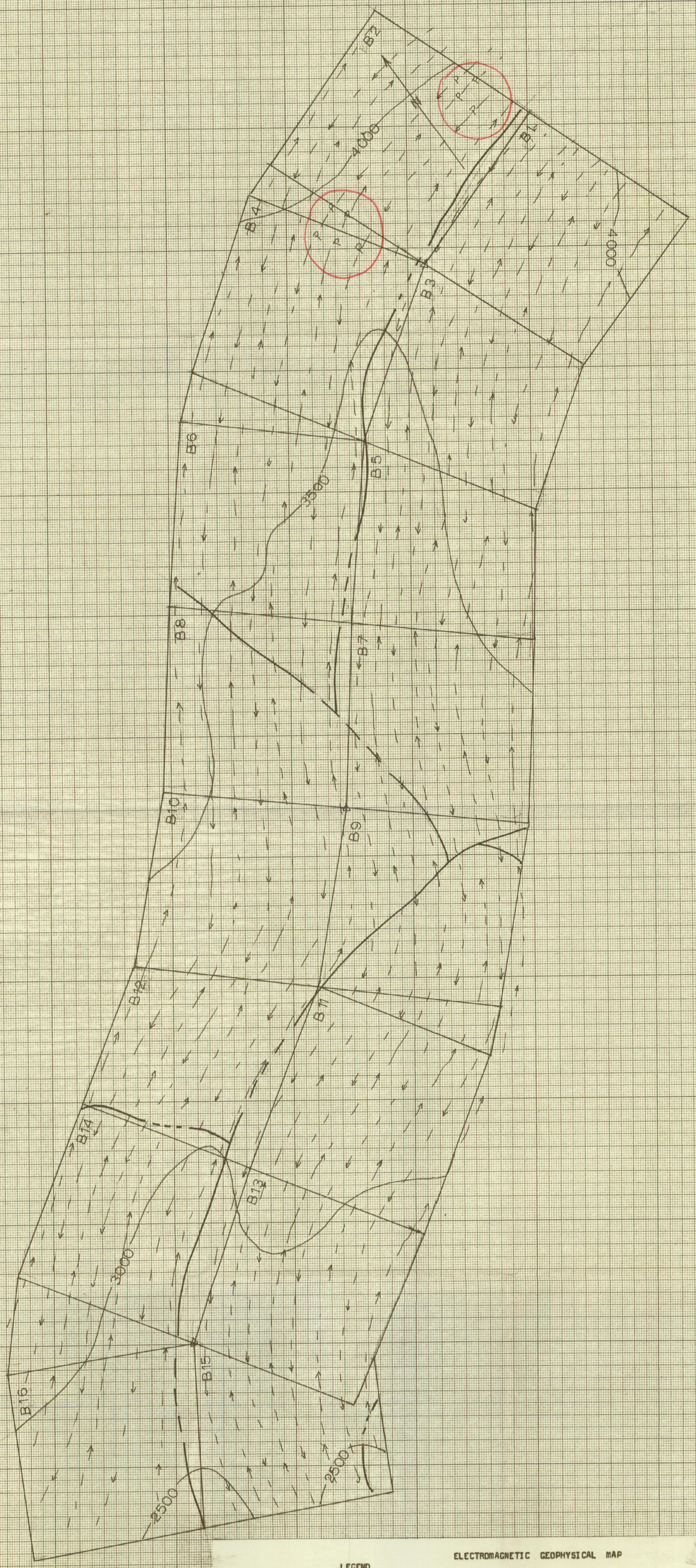
LEGEND

- ▬ ▬ Trend of the conductor or cross-over effect.
- — → — Flight lines.
- △ Check points.

To accompany a report by C. B. Selmser, P. Eng. on the A group, Mayo district, Y. T.

C. B. Selmser

GEO CAL LIMITED
2658 NELSON AVE.
WEST VANCOUVER, B. C.



ELECTROMAGNETIC GEOPHYSICAL MAP

Arivaca Explorations Ltd.
B Group
Mayo District

LEGEND

- Trend of the conductor or cross-over effect.
- Flight lines.
- △ Check points.

Scale: 1 in. = 500 ft. Feb. 25, 1966

To accompany a report by C. B. Selmser, P. Eng. on the B group, Mayo district, Y. T. C. B. Selmser

GEO CAL LIMITED
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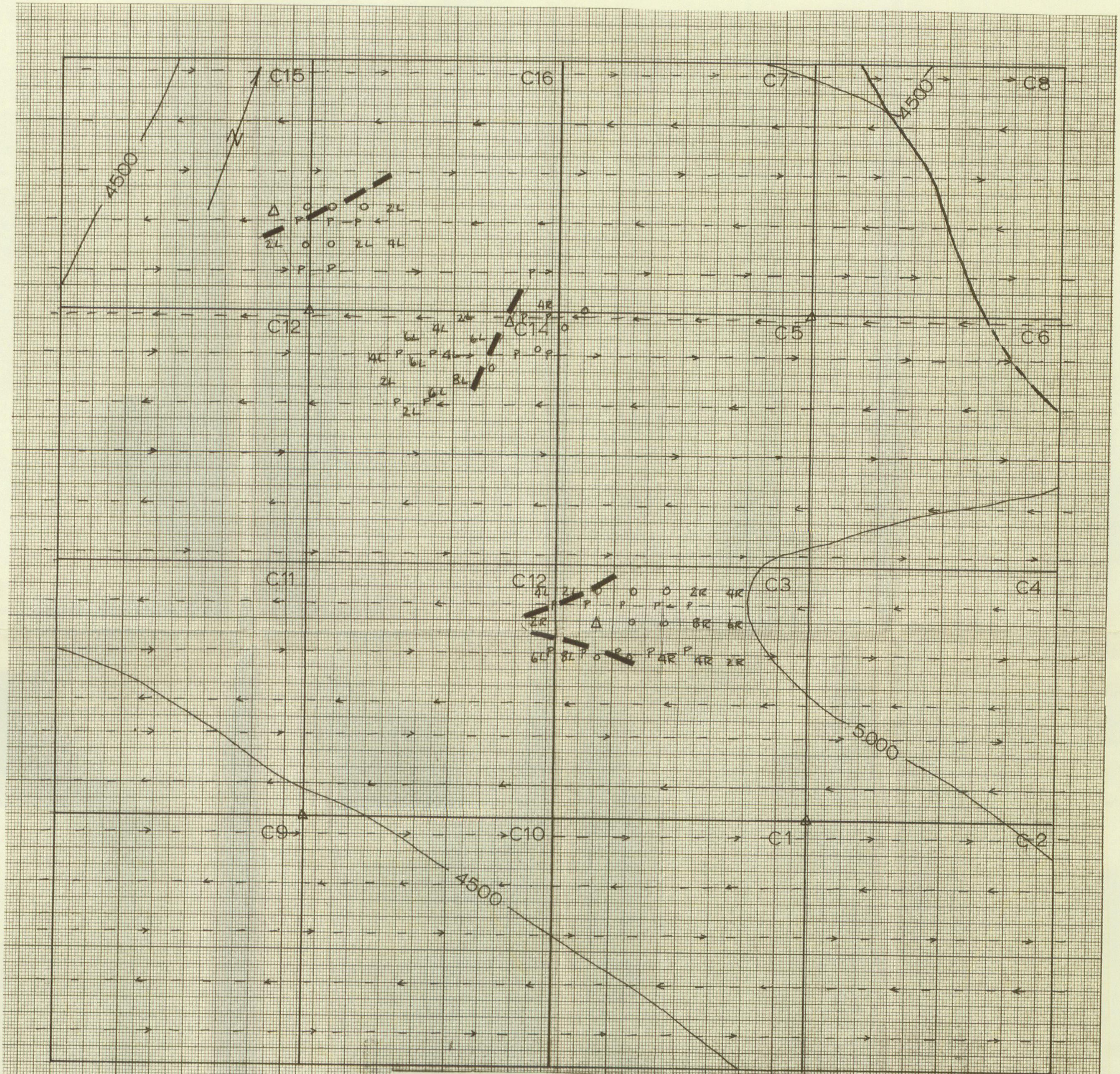
WEST VANCOUVER, B. C.



LEGEND

Trend of the conductor or cross-over effect.

Flight lines.

Check points.

GEO CAL LIMITED
2658 NELSON AVE.
WEST VANCOUVER, B.C.

ELECTROMAGNETIC GEOPHYSICAL MAP

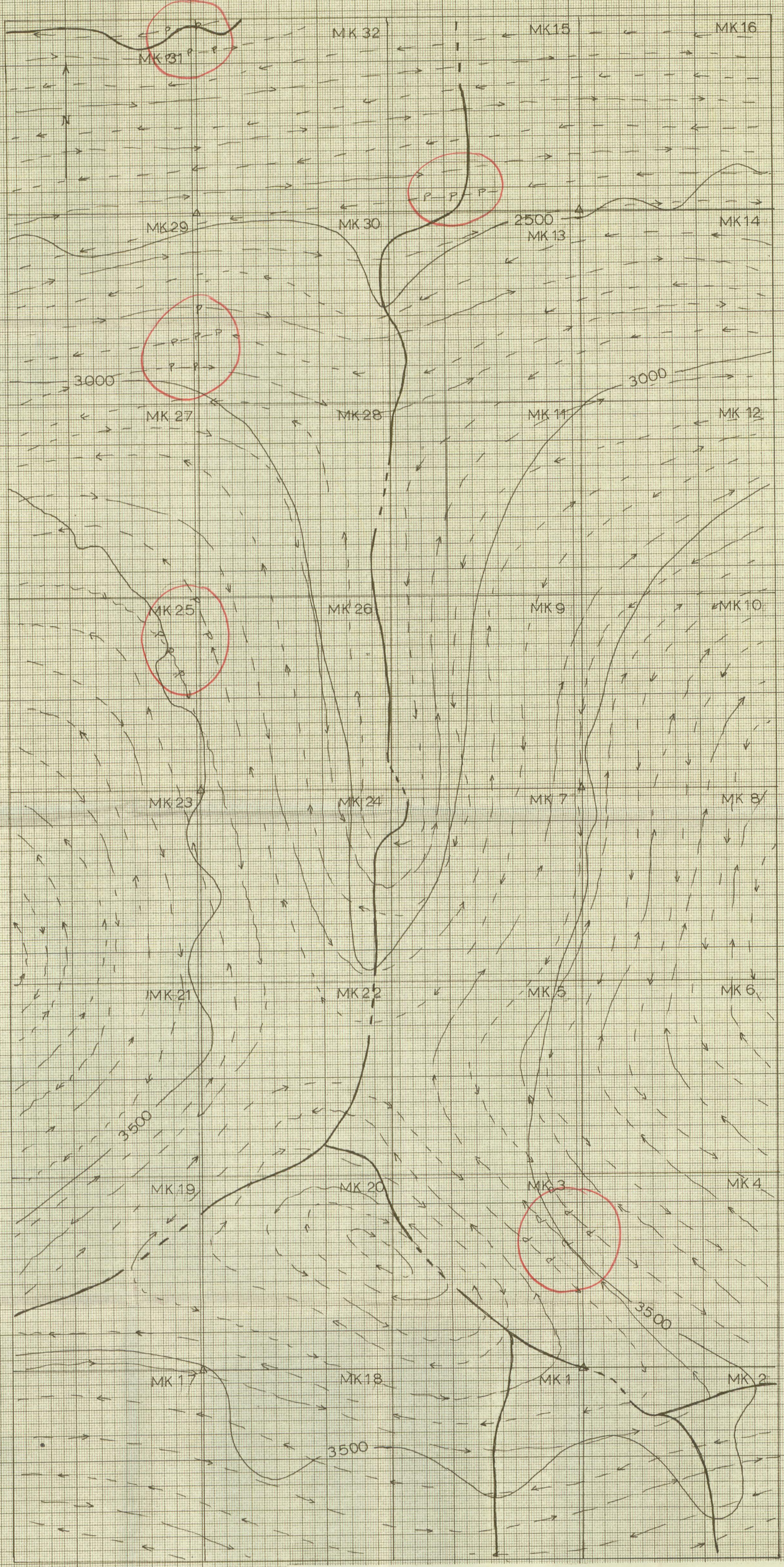
Ariveca Explorations Ltd.
C Group
Mayo District

Scale: 1 in. = 500 ft. Feb. 25, 1966

To accompany a report by C. B. Selmser, P. Eng. on the C group, Mayo district, Y. T. T.

C. B. Selmser

FIG 4



ELECTROMAGNETIC GEOPHYSICAL MAP

Ariveca Explorations Ltd.
M K Group
Mayo District

Scale: 1 in. = 500 ft. Feb. 25,1966

LEGEND

Trend of conductor or cross-over effect.
Flight lines.
Check points.

GEO CAL LIMITED
2658 NELSON AVE.
WEST VANCOUVER, B. C.

To accompany a report by C. B. Selmser, P. Eng. on the M K group, Mayo district, Y. T.

C. B. Selmser

Fig. 5

LEGEND

Trend of conductor or cross-over effect.
Flight lines.
Check points.

GEO CAL LIMITED
2658 NELSON AVE.
WEST VANCOUVER, B. C.

ELECTROMAGNETIC GEOPHYSICAL MAP

Arivaca Explorations Ltd.
JAB Group
Mayo District

Scale: 1 in. = 500 ft. Feb. 25, 1966

To accompany a report by C. B. Selmser, P. Eng. on the JAB Group, Mayo district, Y. T. C. B. Selmser

FIG. 6