1114

A Geophysical Report On
An Induced Polarization Survey

Claims covered: Agate 1 to 4 inclusive
Agate 6
Karen 1 and 2
Tom 1 to 4 inclusive
Glen 1 to 4 inclusive
JOE 2, 8, 12, 20

Kamloops Area, B. C.

Prepared for
Buchanan Mines Limited

Prepared by
John Lloyd, M. Sc.
Geophysicist

~~AGATE, TOM 1 GLEN,~~
~~Joe 8 Group~~ in Adams Lake Area
(51°, 119°, S.W.)
AGATE GROUP, TOM & GLEN, JOE A

Date Started: August 22, 1966

Date Completed: November 11, 1966

REPORT ON

INDUCED POLARIZATION (I.P.) AND GROUND MAGNETOMETER SURVEYS ADAMS LAKE AREA, BRITISH COLUMBIA

F O R

B U C H A N A N M I N E S L I M I T E D

EDMONTON, ALBERTA

B Y

EAGLE GEOPHYSICS LIMITED

REXDALE, ONTARIO

JANUARY, 1967

TABLE OF CONTENTS

	PAGE
INTRODUCTION	1
PROPERTY AND LOCATION	3
SURVEY SPECIFICATIONS	4
INTERPRETATION PROCEDURES	6
GEOLOGICAL ENVIROMENT	8
DISCUSSION OF RESULTS	9
SUMMARY AND RECOMMENDATIONS	15
APPENDIX	
COST OF SURVEYS	(i)
PERSONNEL EMPLOYED ON SURVEYS	(ii)
ACCOMPANYING MAPS	MAP POCKET
Reconnaissance I.P. Survey - Apparent Chargeability Profiles (Bennett Group)	Map 101-1 # 1
Reconnaissance I.P. Survey - Apparent Resistivity Profiles (Bennett Group)	Map 101-2 # 1
Interpretation Map and Magnetometer Survey (Bennett Group)	Map 101-3 # 2
Detail I.P. Survey - Apparent Chargeability and Resistivity Profiles (Bennett Group)	Map 101-4 # 3
I.P. Survey - Apparent Chargeability Profiles (Tom and Glen Groups)	Map 101-5 # 4
I.P. Survey - Apparent Resistivity Profiles (Tom and Glen Groups)	Map 101-6 # 5
Interpretation Map and Magnetometer Survey (Tom and Glen Groups)	Map 101-7 # 6

INTRODUCTION

Between August 22nd and November 11th, 1966, Eagle Geophysics Limited carried out Induced Polarization (I.P.) and ground magnetometer surveys on three properties held by Buchanan Mines Limited. These properties, known respectively as the Bennett, the Tom and the Glen claim groups, are located in the Adams Lake area of British Columbia.

The survey was conducted by Mr. J. Lloyd, geophysicist and Mr. V. R. Fallstrom, geophysical operator, both of Eagle Geophysics Limited, assisted by four geophysical helpers provided by Buchanan Mines Limited.

The survey lines, along which the electrical and magnetic readings were taken, were approximately 400 feet apart, turned off at right angles from a well-cut baseline, having a bearing of approximately N.45^{o}W.

The I.P. reconnaissance measurements were made using the "three electrode array" method of surveying. The basic electrode separation was 200 feet and the basic station interval was 100 feet. As the survey proceeded the anomalous zones located were re-surveyed using multiple electrode spacings and different systems of surveying at appropriate station intervals, to give additional information necessary to carry out a more thorough interpretation. In addition to readings of apparent chargeability (the I.P. response parameter) simultaneous measurements of apparent resistivity were also made.

The magnetic measurements were made at 100-foot station intervals along each survey line. In the case of steep magnetic gradients

readings were taken every 50 feet or in some cases every 25 feet.

The data from the surveys are shown on seven maps accompanying this report. The reconnaissance apparent chargeability and apparent resistivity values for each claim group are shown in profile form on base maps whose horizontal scales are 1 inch to 200 feet, and vertical scales are 10 milliseconds per inch and 2 inches per logarithmic cycle for the apparent chargeability and the apparent resistivity respectively. These maps are numbers 101-1; 101-2; 101-5 and 101-6. The detail apparent chargeability and apparent resistivity values for the Bennett claim group are shown on a rectilinear plan whose horizontal scale is 1 inch to 100 feet, and whose vertical scales are 5 milliseconds per inch and 4 inches per logarithmic cycle for the apparent chargeability and apparent resistivity respectively. This plan is map number 101-4. The detail apparent chargeability and apparent resistivity values for the Tom and Glen claim groups are shown on the apparent chargeability and apparent resistivity reconnaissance maps. These maps are numbers 101-5 and 101-6. The writer's interpretation of all the geophysical data is shown on the magnetometer survey maps whose horizontal scales are 1 inch to 200 feet and whose contour intervals are 100 gammas. These maps are numbers 101-3 and 101-7.

PROPERTY AND LOCATION

The properties are situated in the Kamloops Mining Division of British Columbia and lie in the south-west quadrant of the one degree quadrilateral whose south-east corner is at 51°N. latitude and 119°W. longitude.

The following mineral claims in whole or in part were surveyed.

The Bennett group:	Agate 1 to 4 inclusive
	Agate 6.
	Karen 1 to 2 inclusive
The Tom group:	Tom 1 to 4 inclusive
The Glen group:	Glen 1 to 4 inclusive

The Bennett claim group is located on the west side of Adams Lake and can be reached from the town of Barriere by a good all-weather gravel road. The distance from Barriere to the property is about 25 miles.

The Tom and Glen claim groups are located on the east side of Adams Lake and can be reached by a six mile boat trip from the Bennett claim group.

SURVEY SPECIFICATIONS

The Induced Polarization (I.P.) survey was carried out using a pulse-type system manufactured by Huntec Limited of Toronto, Ontario. With this system measurements are made in the time domain.

The instrument obtains its power from a gasoline engine, coupled to a 7.5 kw., 400 cycle, three phase generator. This provides for a maximum of 7.5 kw. d.c. to the ground. The cycling rate is 1.5 seconds "current on" and 0.5 seconds "current off", the pulses reversing continuously in polarity. The data recorded in the field consists of careful measurements of the current (I) in amperes flowing through electrodes C_1 and C_2, the primary voltage (V_p) appearing between the potential electrodes, P_1 and P_2, during the "current on" part of the cycle and a secondary or overvoltage (V_s) appearing between P_1 and P_2 during the "current off" part of the cycle. The apparent chargeability (M_a) in milliseconds is calculated by dividing the secondary voltage by the primary voltage and multiplying by 400, which is the sampling time in milliseconds of the receiver unit. The apparent resistivity (ρ_a) in ohm-metres is proportional to the ratio of the primary voltage and the measured current, the proportionality factor depending on the geometry of the array used. The resistivity and chargeability obtained are called "apparent" as they are values which that portion of the earth sampled would have if it were homogeneous. As the earth sampled is usually inhomogeneous the calculated apparent resistivity and apparent chargeability are functions of the actual resistivity and actual chargeability of the rocks.

The majority of the survey was carried out using the "three electrode array" method of surveying. In this method the current electrode C_1 and the two potential electrodes P_1 and P_2 are moved in unison along the survey lines. The spacing between these three electrodes is kept constant for each traverse at a distance roughly equal to the depth to be explored by that particular traverse. The second current electrode C_2 is kept fixed at "infinity".

Thus, on a "three electrode array" traverse with an electrode spacing of 200 feet, a body lying at a depth of 150 feet will produce a strong response, whereas the same body lying at a depth of 200 feet will produce a much weaker response. By running subsequent traverses at different electrode spacings more precise estimates can be made of depth, width, thickness and percentage sulphides of any zones located by this method.

The "three electrode array" method of surveying with a 200-foot electrode separation was used over the three claim groups in order to detect and outline possible zones of sulphide mineralization. Subsequent detail work was also carried out using either the "three electrode array", the "dipole-dipole array" or the "gradient array" method of surveying. This detail work consisted of some particular combination of 25-foot, 50-foot, 100-foot, 300-foot or 400-foot electrode separations run over certain lines as deemed necessary to give additional information for the selection of suitable drilling targets.

For the magnetic survey a Sharpe's MF1 fluxgate magnetometer was used. This instrument measures variations in the vertical component of the earth's magnetic field to an accuracy of $\pm$ 10 gammas. Corrections for diurnal variations were made by tying in to previously established base stations at intervals not exceeding two hours.

INTERPRETATION PROCEDURES

Induced Polarization interpretation procedures have been most completely developed in situations of mineralized horizontal layering where the electrode separations used are small compared with the lateral extent of the mineralized bodies. Geologically the porphyry coppers of large lateral extent are practical examples where such interpretation procedures can be used to good advantage.

For more confined bodies, where the electrode separations used are often large compared with the lateral extent of the bodies themselves, the complex problem of resolving the combined effects of depth, width, dip and true chargeability of steeply dipping bodies together with the physical characteristics of overburden and country rocks has only recently been studied in detail. The results of this work are as yet unpublished. The interpreter must therefore use empirical solutions plus experience gained from surveys carried out over known sulphide bodies under similar geological conditions to assist in his interpretation.

The interpretation maps submitted with this report outline certain anomalous zones which are in some cases known and in other cases believed to correspond to disseminated sulphide mineralization. Since the I.P. measurements are basically volume sampling measurements, the actual causative bodies are probably narrowerand less well located than the zones indicated on the maps.

The I.P. method does not always indicate a very narrow massive sulphide zone, particularly if it is close to a much wider body of disseminated sulphides or for that matter within a zone of rocks having

a high chargeability background. However, in some cases, particularly within zone J on the Glen claim group and to a less extent within zone D on the Tom claim group, narrow massive sulphide zones are believed to occur. These are indicated on the interpretation maps as important I.P. linear trends within the anomalous zones.

In some cases, where sufficient I.P. data were taken, estimates of depth, width and dip have been made. Based on these estimates drill holes have been spotted at locations considered most favourable for the best intersection of the probable causative bodies.

Estimates of average total percentage sulphides by volume have in some cases been made. Inasmuch as these estimates are based on observed or apparent chargeability values and not on true chargeability values they are therefore minimum estimates. These estimates will also be approximate since the relationship between chargeability and percentage sulphide content of a particular zone is affected by such things as grain size, resistivity contrast, quantity and nature of absorbed water, degree of interconnection of mineralization and many other factors. The rule-of-thumb used in this interpretation, based on past experience, is that 1% by volume of sulphide mineralization corresponds to between 5 and 15 milliseconds of true chargeability.

GEOLOGICAL ENVIROMENT

The three claim groups are underlain by similar rock assemblages. These rocks are mainly strongly metamorphosed and of sedimentary and volcanic origin; green phyllites, chlorite schists and greenstones being the main rock types. Foliation is strongly developed in these rocks but lineations are confined to the phyllites and schists and are apparently lacking in the greenstones. The general strike direction is about N.50°W. and dips (schistosity) vary from about 30° to 40° and are towards the northeast. The rocks are of Permian age or earlier, having undergone one or possibly two periods of strong metamorphism.

DISCUSSION OF RESULTS

The interpretation of the chargeability, resistivity and magnetic data is shown on the magnetometer survey maps.

The Bennett Group

The I.P. survey has delineated three anomalous zones on this group. These are zones A, B and C as shown on the interpretation and magnetometer survey map (map number 101-3). Zones A and B are also more carefully outlined on the detail I.P. survey map (map number 101-4).

Zone A has a strike length of about 4,500 feet and still remains open at its northwest end. The width of this zone is about 400 feet. From previous trenching and present diamond drilling this anomalous zone is known to be caused by sulphides. By studying the multiple electrode spacing work carried out on lines 3+00NW, 4+00NW, 8+00NW and 12+00NW the estimated size and shape of this sulphide zone causing the anomaly is believed to be as follows. For the most part the upper surface of the sulphide zone should be close to or coincident with bedrock surface. The zone most probably dips towards the northeast at an angle ranging from 25° to 40°. It is expected to have a down dip extension of some 300 to 400 feet. Below this depth sulphide mineralization is expected to be weaker but not necessarily absent. The total sulphide content by volume is estimated to be from 2% to 4%.

Zone B, which closely parallels zone A, has a strike length of about 3,000 feet and an average width of some 300 feet. In general its dip and shape are believed to be very similar to zone A. However

its down dip extension is expected to be in the order of 150 to 200 feet and the total sulphide content by volume is estimated to be from 1% to 2%.

Zone C has a strike length of about 400 feet, but remains open at both ends. Although no detail work was carried out on this anomaly it is believed to be caused by a sulphide zone very similar to that of zone B.

The magnetometer survey revealed one large and two small areas of high magnetic intensity. The large area of high magnetic intensity in the northern portion of the property is thought to be caused by thin, rich, near surface bands of magnetite. The magnetic lineations in the area follow closely the strike of the rocks again indicating that the magnetite is parallel to the schistosity. Basic dykes which do occur in this general area characteristically trend north or a few degrees east of north. Since the magnetic lineations are almost at right angles to this general trend it is not believed that the magnetic anomalies are caused by basic dykes. The discontinuity of the magnetic lineations also supports this viewpoint.

The major magnetic contact, extending from the north-eastern end of line 12+00NW to approximately the baseline on line 40+00NW, coincides very closely with a change in the observed resistivity values. In many cases such a coincidence often indicates a distinct change in rock type. However in this particular case the writer does not believe a major geological contact to be present, but is of the opinion that an increase in the magnetite content of the chloritic schist could account for the magnetic anomalies.

There is a definite lack of I.P. response from the rocks thought to contain magnetite. This may be explained as follows. If the magnetite is contained in thin, rich, bands no I.P. response would in fact be expected. If the magnetite was finely disseminated a weak I.P. response would be expected. The writer believes the former to be correct. In this particular case the magnetic anomalies bear little if any relationship to the I.P. anomalies believed caused by the sulphide zones.

The Tom Group

The I.P. survey has delineated three anomalous zones on this group. These are zones D, E and F as shown on the interpretation and magnetometer survey map (map number 101-7).

Zone D is the largest zone and has been outlined as an area where the I.P. response is greater than approximately 3 to 4 times the normal background chargeability for the area. Hence the outline of the zone is simple. However within the zone the nature of the I.P. response is fairly complex. Despite the complex nature of the I.P. response six important linear I.P. trends have been indicated on the interpretation map. These linear I.P. trends are roughly parallel to the general strike direction of the rocks. The exact position and direction of these trends are only approximate since the survey lines are 400 feet apart, and for the most part only one electrode spacing was used, and the magnetic and resistivity readings help only to a very limited degree in attempting any useful correlation. From a geological point of view these I.P. trends are believed to represent the strike direction and approximate position of more sulphide rich mineralisation within the zone. They are therefore significant drill targets.

Zone E is a smaller, more clearly defined, zone lying immediately to the north of zone D. It is believed to represent a zone of sulphide mineralization about 150 feet wide and having a strike length not greater than 700 to 800 feet. Its strike direction is parallel to trends occuring within zone D.

Zone F represents, in the opinion of the writer, the most significant drill target located on this group. An interesting feature of this zone is its strike direction. This is approximately north-south whereas the strike direction of the major trends within zone D is approximately northwest-southeast. There is also a slight correlation of the chargeability data with the magnetic data, which is generally lacking in all previous cases. This zone has a strike length of at least 1,200 feet and still remains undelineated in the direction of its strike towards the south.

The amplitude response and general characteristics of this anomaly are similar to those obtained over zone A on the Bennett claim group. Hence this zone (zone F) could represent a sulphide zone similar in many respects to zone A of the Bennett group.

The Glen Group

The I.P. survey has delineated four anomalous zones on this group. These are zones G, H, I and J as shown on the interpretation and magnetometer survey map (map number 101-7).

Zones G and H are two small parallel zones about 150 to 200 feet wide and have a strike length of about 400 to 600 feet. Both zones remain open in the direction of their strike towards the southeast. Both zones correlate with weak resistivity lows. However ambiguity

exists here in respect of resistivity interpretation because the zones occur in very rough terrain. Zone G is deeply dissected by a fast flowing creek. Should sulphide mineralization be the cause of these anomalies then the total sulphide content by volume is estimated to be from 1% to 2%.

Zone I is about 1,600 feet long and remains open in both directions along its strike. Its width is about 400 feet. The total sulphide content by volume is estimated to be from 1% to 2%. Should the source of this anomaly be caused solely by sulphide mineralization then the main concentration of sulphides would most probably occur within the first 150 feet below surface.

Zone J is the largest and most complex zone to be located during the course of the survey. It has several distinct features lacking in all previous zones.

Firstly it coincides fairly closely with two broad resistivity lows. This coincidence could be explained either by the existence of a rich sulphide zone or by the presence of graphite bands or by a combination of both these features. The last explanation seems most probable, since the zone is known to contain both graphite and sulphides.

Secondly, individual chargeability highs are obtained within the general high response of the zone. By correlating these highs from line to line six important linear I.P. trends have been indicated on the interpretation map. These linear I.P. trends are believed to be caused by a complex series of bands of intermixed sulphides and graphite. Since the survey lines were 400 feet apart and only one electrode spacing was used the exact position and direction of these trends are only approximate.

Thirdly, contained within the zone are a number of sharp magnetic highs and corresponding lows. The linear I.P. trends within this zone appear to follow, at least to some degree, the magnetic lows. There are a number of possible explanations for this correlation. The bands of intermixed sulphides and graphite may contain little or no magnetite or pyrohotite in comparison with the host rock in general. Should these bands contain pyrohotite and no magnetite then a correlation between the linear trends and the magnetic highs would be expected. However if these bands contain a little pyrohotite and some magnetite, then, if at the time of mineral deposition within this zone the earth's magnetic field was reversed, the previously noted correlation could be explained. However in rocks of this age noticeable reversals in the earth's magnetic field are not common.

Finally, the writer would like to point out that in other areas of British Columbia, although dealing with rocks of different age and composition, it is not uncommon to have magnetic lows associated with sulphide zones.

SUMMARY AND RECOMMENDATIONS

Between August 22nd and November 11th, 1966, Eagle Geophysics Limited carried out Induced Polarization (I.P.) and magnetometer surveys for Buchanan Mines Limited on the Bennett, the Tom and the Glen claim groups located in the Adams Lake area of British Columbia.

The surveys outlined ten anomalous zones. Three occur on the Bennett group (zones A, B and C), three on the Tom group (zones D, E and F) and four on the Glen group (zones G, H, I and J).

Prior to the present geophysical surveys, zones A, B and part of zones D and J were known from previous geological investigations to contain sulphides. The remaining six zones (zones C, E, F, G, H and I) were discovered during the present surveys, and are believed to contain sulphides.

The writer considers all ten zones to be worthy of further investigation. To evaluate the possible ore potential of the outlined zones the following programme of work is recommended.

The Bennett Group.

A total of ten additional diamond drill holes are proposed for this group. These proposed holes are shown on map number 101-3.

Holes 1 to 4 are proposed to test the northwest portion of zone A. These holes should be vertical and drilled to a depth of at least 450 feet. As a result of very rough terrain it may not be possible to drill these holes in the exact locations proposed. However this is most probably the only line at this end of the zone where any drilling can be carried out at normal drilling costs.

Holes 5 and 6 are recommended to test a previously undrilled but geophysically interesting portion of zone A. These holes should be vertical and drilled to a depth of at least 500 feet.

Holes 7 and 8 are recommended to test an interesting section of zone B. These holes should be vertical and drilled to a depth of at least 300 feet.

Holes 9 and 10 are recommended to test the previously unknown C zone. These holes should be vertical and drilled to a depth of at least 300 feet.

The Tom Group.

Prior to carrying out any diamond drilling on this group it is recommended that a careful geological investigation of zone D be carried out in an attempt to trace any mineralized bands, known to occur along the shore, up the mountain side. An attempt should also be made to correlate any mineralized zones so located with the I.P. linear trends as shown on map 101-7.

To carry out this work effectively it may also be necessary to do some surface trenching. This part of the programme should be directed by the geological engineer in charge of the project.

Should this geological work prove encouraging then it is recommended that nine diamond drill holes be drilled on this group. The location of these holes (as shown on map 101-7) may have to be slightly modified, as a result of the geological investigation, since these holes are based mainly on geophysical data.

Holes 11 to 14 recommended to test zone D, should be angle holes drilled at 60° in the direction of the arrow as shown on map number 101-7. The total length of each hole should be not less than 400 feet.

Holes 15 and 16 recommended to test zone E should be angle holes drilled at 60° in the direction of the arrow as shown on the map. The total length of each hole should be not less than 400 feet.

Holes 17 to 19 recommended to test zone F should be vertical holes drilled to a depth of at least 450 feet. Should information obtained from drilling holes 17 to 19 be encouraging, it is recommended that further I.P. work be done in an attempt to close off zone F at its southern extremity.

The Glen Group.

No drilling is recommended on zones G and H until some geological investigation of the interpreted zones have been carried out. This could be accomplished at least in part by mapping the rocks outcropping in the creek bed which passes through a portion of zone G.

Holes 20 and 21 recommended to test zone I should be 60° angle holes in the direction of the arrow as shown on map number 101-7. The total length of each hole should be not less than 300 feet.

Prior to carrying out any diamond drilling on zone J it is recommended that a careful geological investigation with surface trenching where necessary be completed. In addition magnetometer readings on lines 100 feet apart and at station intervals of 50 feet should also be taken across this interpreted zone. Correlation of this data with the present geophysical data may lead to more intelligent selection of diamond drilling targets.

Should it be necessary to proceed immediately with a diamond drilling programme on this zone, then six holes, based mainly on geophysical data are recommended. These are holes 22 to 27 and should be drilled vertically to a depth of at least 300 feet.

Should results of this work on zone J be encouraging, the zone should then be completely outlined towards the southeast by geophysical or geological methods.

Although a total of 27 drill holes have been recommended, the completion of this programme will clearly depend on the success of the initial few holes within each zone.

Respectfully submitted

EAGLE GEOPHYSICS LIMITED

John Lloyd, M.Sc.,
Geophysicist.

Rexdale, Ontario.

January, 1967.

COST OF SURVEYS

From August 22nd to November 11th, 1966, Eagle Geophysics Limited provided a geophysicist, a geophysical operator and a 7.5. kw I.P. equipment at a cost of $6,400.00 per month.

Drafting and interpretation charges were extra. Therefore the total cost of all services provided by Eagle Geophysics Limited was $19,343.19.

PERSONNEL EMPLOYED ON SURVEYS

Name	Occupation	Address	Dates
J. Lloyd	Geophysicist	P.O. Box 125 Rexdale, Ont.	22nd August to 10th October, 1966 17th October to 11th November, 1966 19th December to 23rd December, 1966 7th January to 8th January, 1967
V. R. Fallstrom	Geophysical Operator	"	22nd August to 10th October, 1966 17th October to 11th November, 1966
R. Bradley	Geophysical Helper	Buchanan Mines Ltd., Edmonton, Alta.	22nd August to 9th September, 1966
G. MacMillan	"	"	22nd August to 16th September, 1966
D. McCarthy	"	"	22nd August to 2nd September, 1966
V. Pashniak	"	"	22nd August to 16th September, 1966
P. Willis	"	"	6th September to 10th October, 1966 17th October to 11th November, 1966
N. Engdahl	"	"	10th September to 10th October, 1966 17th October to 11th November, 1966
R. Hebert	"	"	19th September to 29th September, 1966 5th October to 7th October, 1966
W. Gillespie	"	"	19th September to 29th September, 1966

Name	Occupation	Address	Dates
K. McConnell	Geophysical Helper	Buchanan Mines Ltd., Edmonton, Alta.	7th October, 1966
J. Hackett	"	"	17th October to 11th November, 1966
W. McKnight	"	"	17th October to 11th November, 1966
D. Grant	Draftsman	P.O. Box 125, Rexdale, Ont.	29th November to 15th December, 1966 5th January to 7th January, 1967
Mrs. D. Longman	Typist	"	9th January, 1967

CERTIFICATION

I, John Lloyd of 45 Dunfield Avenue, Toronto, Ontario, hereby certify that

(1) I was born in Wales on May 10, 1938.

(2) I am a graduate of the University of Liverpool, England in 1960 with a B.Sc. in Physics and Geology and a graduate of the Royal School of Mines, University of London with a M.Sc. in Geophysics in 1962.

(3) I have been practising my profession for the last seven years.

(4) I have no interest or shares in Buchanan Mines Limited, nor do I expect to receive any.

82M/4E+W.

John Lloyd.

July 19, 1967.

John Lloyd, M.Sc.

APPENDIX

RUDD, GOOLD & ELLIOTT
CHARTERED ACCOUNTANTS
VANCOUVER, B.C. KAMLOOPS, B.C.

RESIDENT PARTNERS
GORDON D. ELLIOTT, C.A.
MORGAN C. FRENCH, B.COM., C.A.
J. BARRIE HARDIE, C.A.
KEITH A. WALLACE, C.A.

TELEPHONE 372-5551

387 FOURTH AVENUE
KAMLOOPS, B.C.

BUCHANAN MINES LTD.

STATEMENT OF GEOPHYSICAL SURVEY EXPENSES

during the FOUR MONTHS ended NOVEMBER 30, 1966

BUCHANAN MINES LTD.

STATEMENT OF GEOPHYSICAL SURVEY EXPENSES

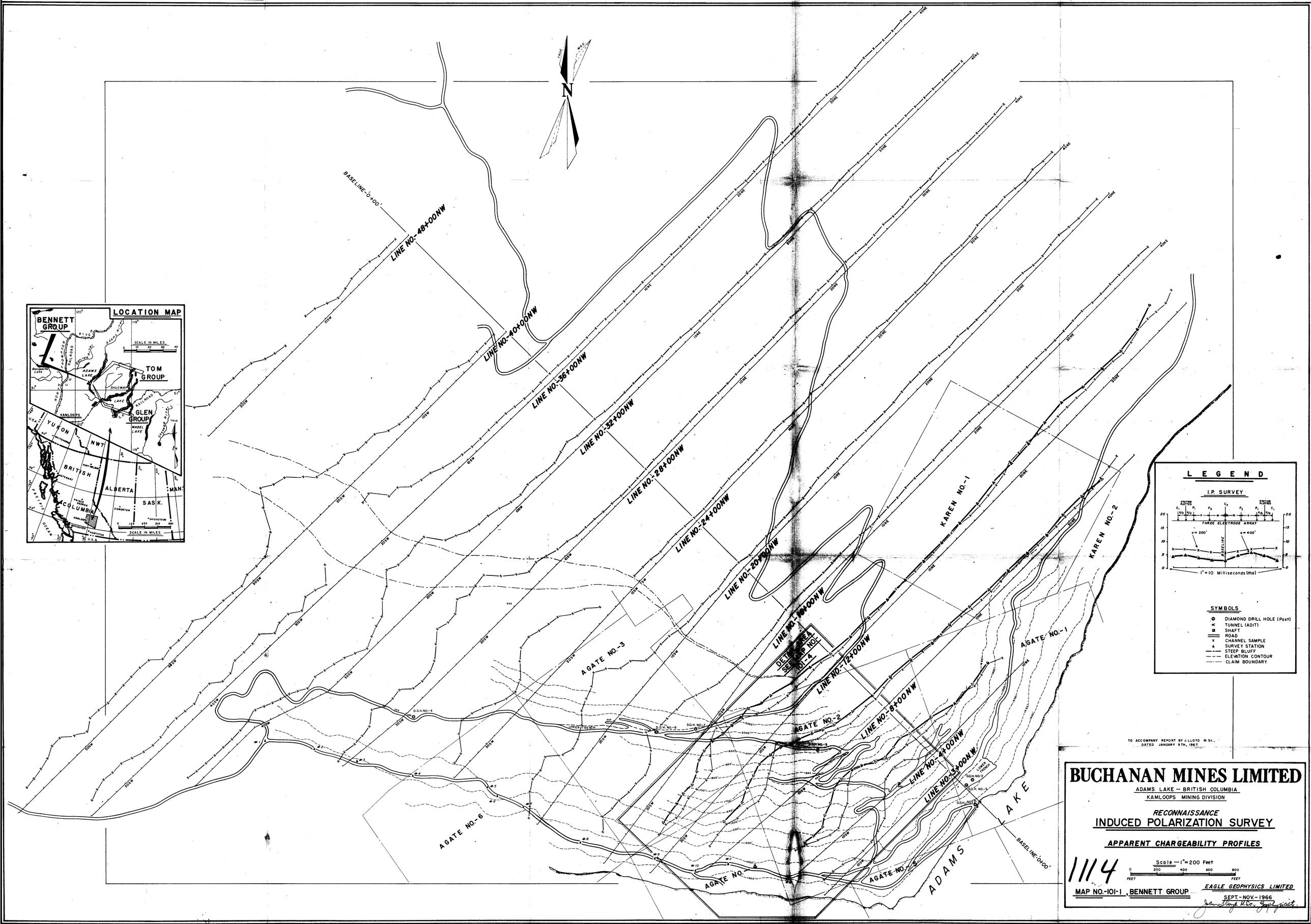
during the FOUR MONTHS ended NOVEMBER 30, 1966

WAGES:		
P. Willis	$1,474.32	
N. Engadahl	1,104.72	
R. Hebert	322.68	
W. Gillespie	229.68	
K. McConnell	228.64	
J. Hackett	691.55	
R. Bradley	639.60	
G. MacMillan	748.80	
D. McCarthy	530.40	
V. Pashniak	748.80	$ 6,719.19
EXPENSES:		
Barriere Motor Inn	$2,638.45	
Agate Bay Resort	250.50	
Interior Tent & Awning	493.58	
Mara Lake Contractors	1,872.65	
Rudlang Construction Ltd.	2,530.35	
Wayne Brown Hillside Linecutters - slashing	2,069.06	
L. Kulchyski & B. Cartwright - slashing	434.00	10,288.59
		$17,007.78

This is to certify that the above wages & expenses were incurred by Buchanan Mines Ltd. in conducting an I.P. and Mag. Survey with associated line cutting, near Adams Lake, B.C. on Joe A Group, Joe B Group and Tom & Glen Group, according to the records of the company, the geophysical report of Eagle Geophysics Limited of January, 1967 and from information available to us.

Kamloops, B.C.
May 1, 1967

Rudd, Goold & Elliott
Chartered Accountants



LEGEND

I.P. SURVEY

SYMBOLS

- DIAMOND DRILL HOLE (Post)
- TUNNEL (ADIT)
- SHAFT
- ROAD
- CHANNEL SAMPLE
- SURVEY STATION
- STEEP BLUFF
- ELEVATION CONTOUR
- CLAIM BOUNDARY

TO ACCOMPANY REPORT BY J. LLOYD M.Sc., DATED JANUARY 9TH, 1967.

BUCHANAN MINES LIMITED

ADAMS LAKE – BRITISH COLUMBIA

KAMLOOPS MINING DIVISION

RECONNAISSANCE

INDUCED POLARIZATION SURVEY

APPARENT CHARGEABILITY PROFILES

1114

Scale – 1"=200 Feet

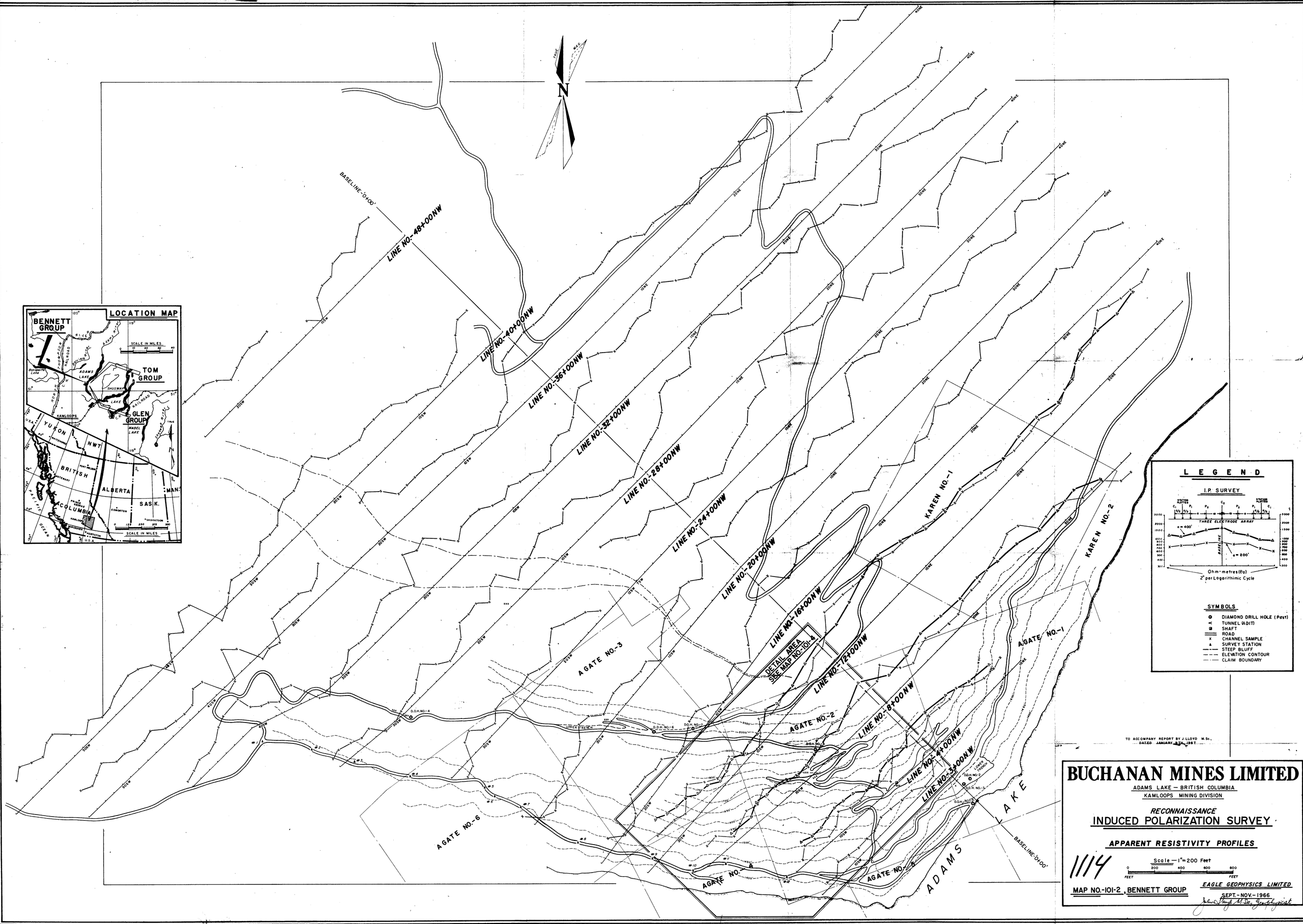
0 200 400 600 800 FEET FEET

MAP NO.-101-1, BENNETT GROUP

EAGLE GEOPHYSICS LIMITED

SEPT.-NOV.-1966

John Lloyd M.Sc., Geophysicist



LEGEND

I.P. SURVEY

SYMBOLS

- DIAMOND DRILL HOLE (Past)
- TUNNEL (ADIT)
- SHAFT
- ROAD
- CHANNEL SAMPLE
- SURVEY STATION
- STEEP BLUFF
- ELEVATION CONTOUR
- CLAIM BOUNDARY

TO ACCOMPANY REPORT BY J. LLOYD M.Sc., DATED JANUARY 8TH, 1967.

BUCHANAN MINES LIMITED

ADAMS LAKE — BRITISH COLUMBIA
KAMLOOPS MINING DIVISION

RECONNAISSANCE
INDUCED POLARIZATION SURVEY

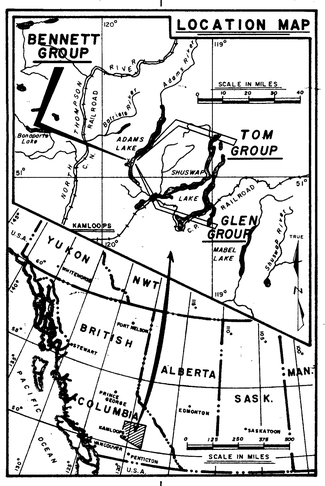
APPARENT RESISTIVITY PROFILES

1114

Scale — 1"=200 Feet
0 200 400 600 800
FEET FEET

MAP NO.-101-2, BENNETT GROUP

EAGLE GEOPHYSICS LIMITED
SEPT.-NOV.-1966
John Lloyd M.Sc., Geophysicist



BASELINE-0+00'

LINE NO.-48+00NW

LINE NO.-40+00NW

LINE NO.-36+00NW

LINE NO.-32+00NW

LINE NO.-28+00NW

LINE NO.-24+00NW

LINE NO.-20+00NW

LINE NO.-16+00NW

LINE NO.-12+00NW

LINE NO.-8+00NW

LINE NO.-4+00NW

LINE NO.-0+00

PROPOSED D.D.H. NO.-1

PROPOSED D.D.H. NO.-2

PROPOSED D.D.H. NO.-3

PROPOSED D.D.H. NO.-4

PROPOSED D.D.H. NO.-5

PROPOSED D.D.H. NO.-6

PROPOSED D.D.H. NO.-7

PROPOSED D.D.H. NO.-8

PROPOSED D.D.H. NO.-9

PROPOSED D.D.H. NO.-10

D.D.H. NO.-1

D.D.H. NO.-2

D.D.H. NO.-3

D.D.H. NO.-4

D.D.H. NO.-5

D.D.H. NO.-6

ZONE "A"

ZONE "B"

ZONE "C"

AGATE NO.-1

AGATE NO.-2

AGATE NO.-3

AGATE NO.-4

AGATE NO.-5

AGATE NO.-6

KAREN NO.-1

KAREN NO.-2

UPPER TRENCH

LOWER TRENCH

ADAMS LAKE

BASELINE-0+00'

LEGEND

MAGNETOMETER SURVEY

CONTOUR INTERVAL 100 GAMMAS

500, 1000 GAMMA CONTOUR

100 GAMMA CONTOUR

MAGNETIC DEPRESSION

BASE STATION — B.S.No.2 16503

INTERPRETATION

CONTACT FROM MAGNETICS

I.P. ANOMALOUS ZONE

PROPOSED DIAMOND DRILL HOLE — VERTICAL

SYMBOLS

- DIAMOND DRILL HOLE (Post)
- TUNNEL (ADIT)
- SHAFT
- ROAD
- CHANNEL SAMPLE
- SURVEY STATION
- STEEP BLUFF
- ELEVATION CONTOUR
- CLAIM BOUNDARY

TO ACCOMPANY REPORT BY J. LLOYD M.Sc., DATED JANUARY 9TH, 1967.

BUCHANAN MINES LIMITED

ADAMS LAKE — BRITISH COLUMBIA

KAMLOOPS MINING DIVISION

INTERPRETATION MAP

AND

MAGNETOMETER SURVEY

Scale — 1" = 200 Feet

0 200 400 600 800 FEET

MAP NO.-101-3, BENNETT GROUP

EAGLE GEOPHYSICS LIMITED

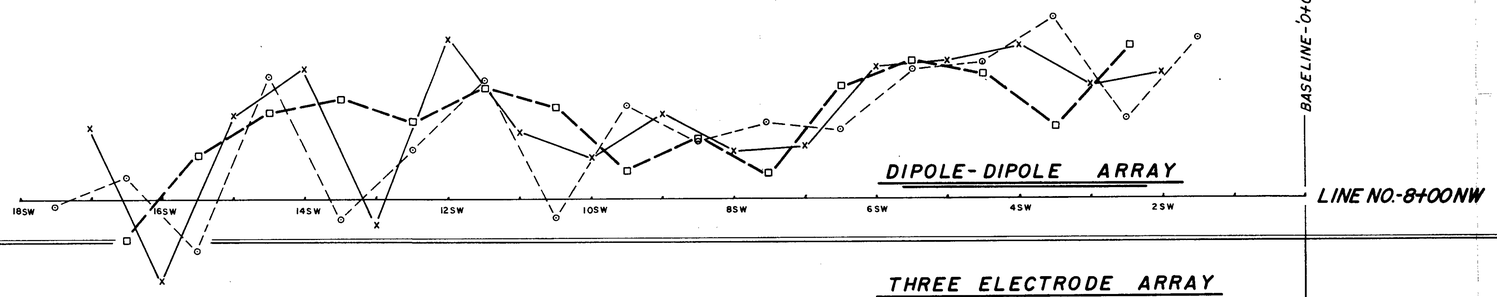
SEPT.-NOV.-1966

J. Lloyd M.Sc., Geophysicist

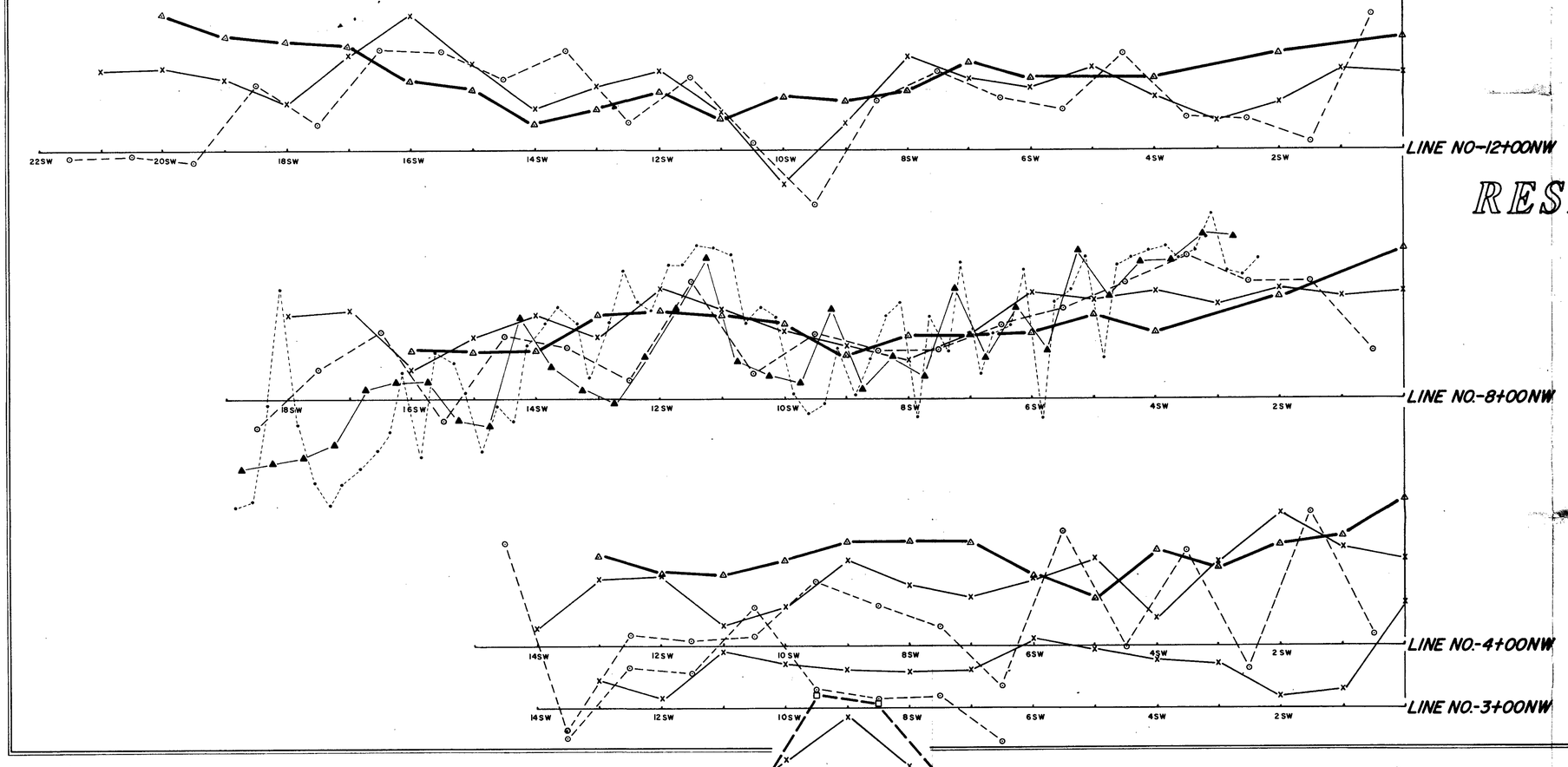
1114

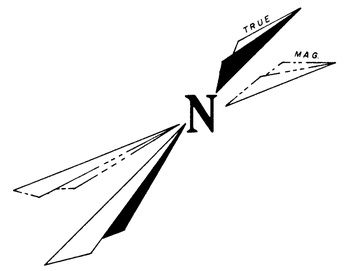
RESISTIVITY

DIPOLE-DIPOLE ARRAY

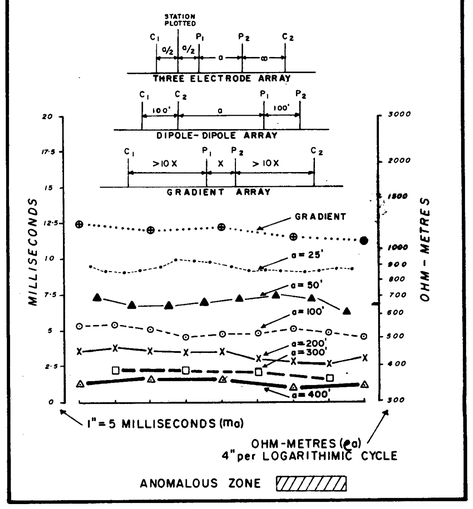


THREE ELECTRODE ARRAY

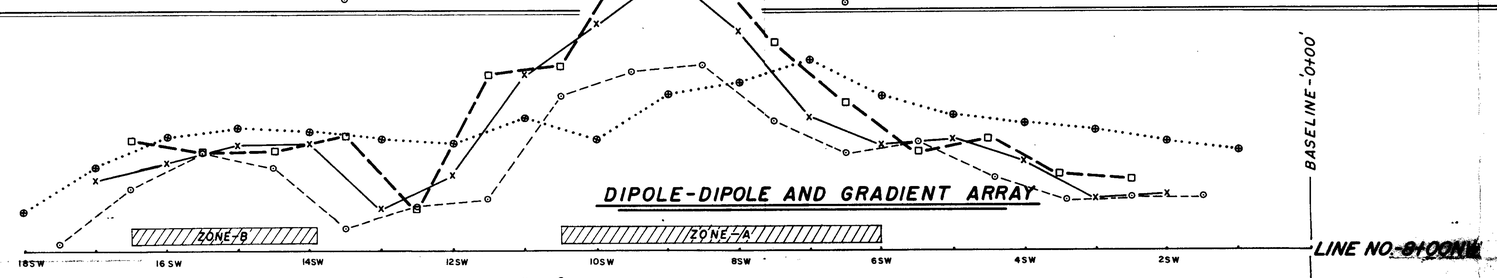




LEGEND

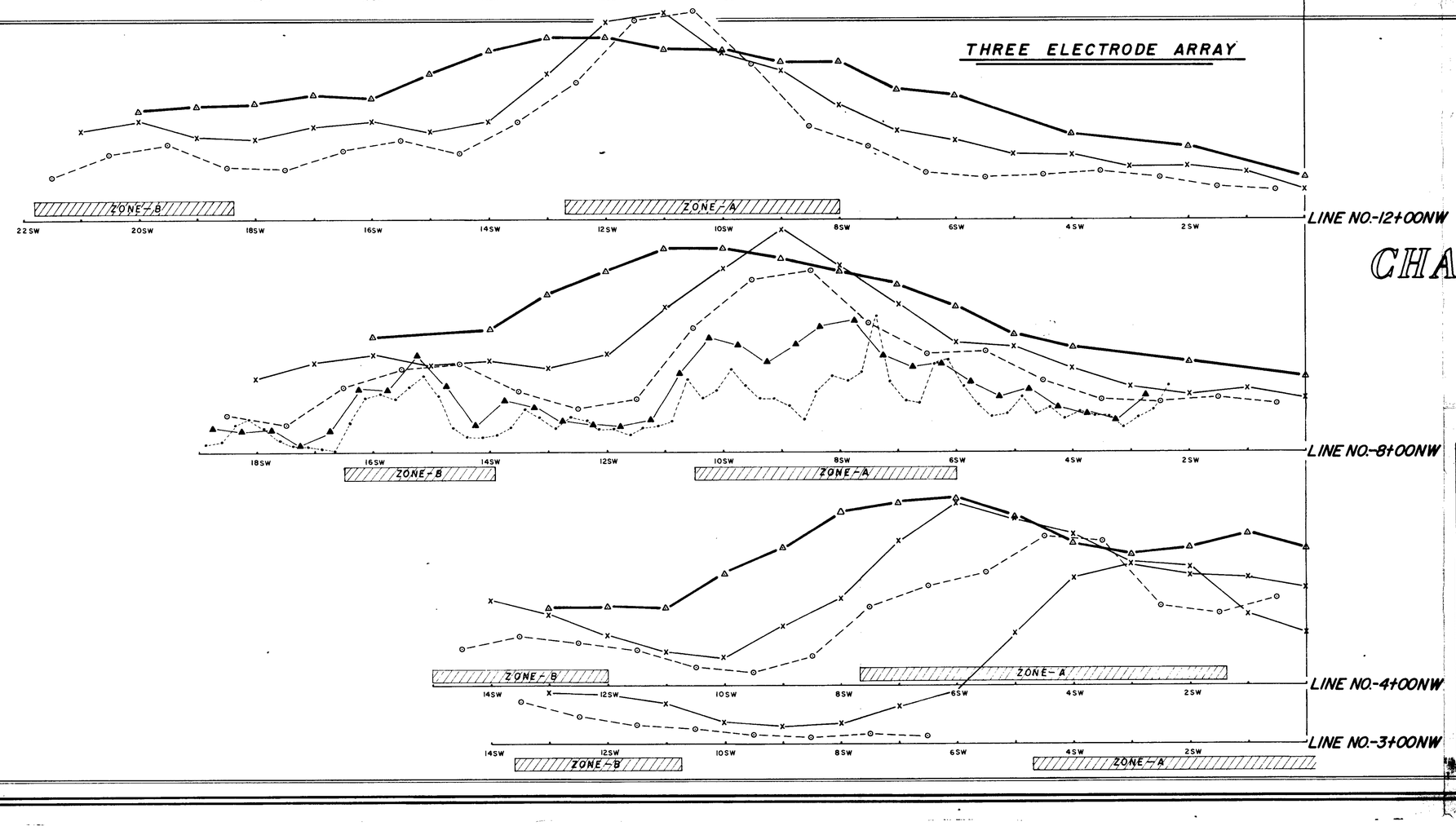


DIPOLE-DIPOLE AND GRADIENT ARRAY



CHARGEABILITY

THREE ELECTRODE ARRAY



TO ACCOMPANY REPORT BY J. LLOYD M.Sc.
DATED JANUARY 9TH, 1967.

BUCHANAN MINES LIMITED

ADAMS LAKE – BRITISH COLUMBIA.
KAMLOOPS MINING DIVISION

— DETAIL —

INDUCED POLARIZATION SURVEY

APPARENT CHARGEABILITY AND RESISTIVITY PROFILES

1114

Scale — 1" = 100 Feet

0 100 200 300 400
FEET FEET

MAP NO.-101-4, BENNETT GROUP

EAGLE GEOPHYSICS LIMITED

SEPT.-NOV.-1966

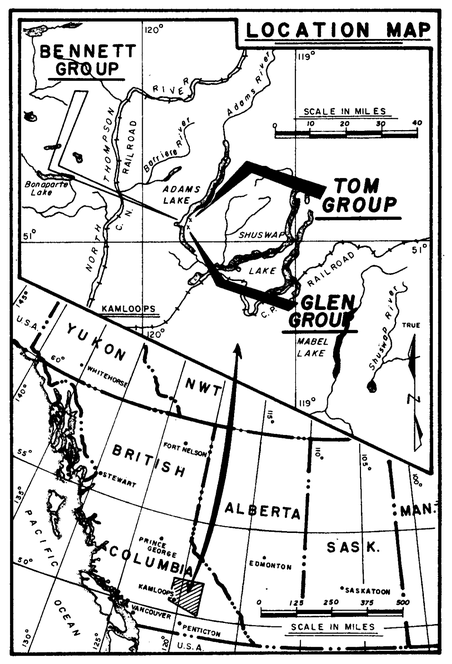
John Lloyd M.Sc., Geophysicist

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 1114 MAP 12

TOM GROUP

MAG.
TRUE
N

LOCATION MAP



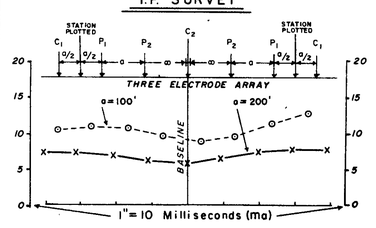
TOM NO.-1
TOM NO.-2
TOM NO.-3
TOM NO.-4
ADAMS LAKE
BASELINE-'0+00'
LINE NO.-0+00
LINE NO.-4+00E
LINE NO.-8+00E
LINE NO.-12+00E
LINE NO.-16+00E
LINE NO.-20+00E
LINE NO.-24+00E
LINE NO.-28+00E
LINE NO.-32+00E

GLEN GROUP

GLEN NO.-1
GLEN NO.-2
GLEN NO.-3
GLEN NO.-4
GLEN NO.-10
GLEN NO.-11
ADAMS LAKE
BASELINE-'0+00'
LINE NO.-0+00
LINE NO.-4+00E
LINE NO.-8+00E
LINE NO.-12+00E
LINE NO.-16+00E

LEGEND

I.P. SURVEY



SYMBOLS
- CREEK
- TUNNEL (ADIT)
- CABIN
- ROAD
- TRAIL
- CLAIM POST AND BOUNDARY

TO ACCOMPANY REPORT BY J. LLOYD M.Sc.,
DATED JANUARY 9TH, 1967.

BUCHANAN MINES LIMITED

ADAMS LAKE — BRITISH COLUMBIA
KAMLOOPS MINING DIVISION

INDUCED POLARIZATION SURVEY

APPARENT CHARGEABILITY PROFILES

1114

Scale — 1"=200 Feet
0 200 400 600 800
FEET FEET

MAP NO.-101-5, TOM GROUP / GLEN GROUP

EAGLE GEOPHYSICS LIMITED
SEPT.-NOV.-1966
John Lloyd M.Sc., Geophysicist

Department of Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 1119 MAP 5

MAG.
TRUE
N

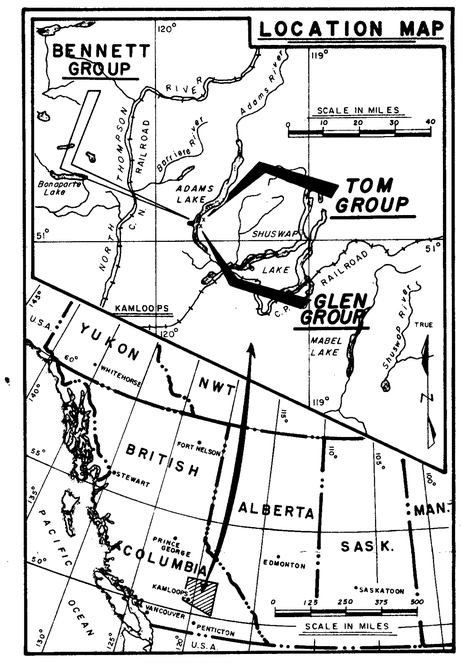
TOM GROUP

TOM NO.-2
TOM NO.-1
TOM NO.-3
TOM NO.-4
BASELINE-'0+00'
LINE NO.-0+00'
LINE NO.-4+00E
LINE NO.-8+00E
LINE NO.-12+00E
LINE NO.-16+00E
LINE NO.-20+00E
LINE NO.-24+00E
LINE NO.-28+00E
LINE NO.-32+00E
ADAMS LAKE

GLEN GROUP

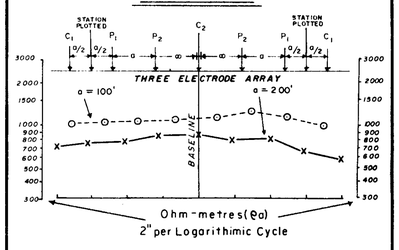
GLEN NO.-2
GLEN NO.-10
GLEN NO.-11
GLEN NO.-1
GLEN NO.-3
GLEN NO.-4
BASELINE-'0+00'
LINE NO.-0+00'
LINE NO.-4+00E
LINE NO.-8+00E
LINE NO.-12+00E
LINE NO.-16+00E
ADAMS LAKE

LOCATION MAP



LEGEND

I.P. SURVEY



SYMBOLS

- CREEK
- TUNNEL (ADIT)
- CABIN
- ROAD
- TRAIL
- CLAIM POST AND BOUNDARY

TO ACCOMPANY REPORT BY J. LLOYD M.Sc., DATED JANUARY 9 TH, 1967.

BUCHANAN MINES LIMITED

ADAMS LAKE — BRITISH COLUMBIA
KAMLOOPS MINING DIVISION

INDUCED POLARIZATION SURVEY

APPARENT RESISTIVITY PROFILES

1119

Scale — 1" = 200 Feet
0 200 400 600 800
FEET FEET

MAP NO.-101-6, TOM GROUP GLEN GROUP

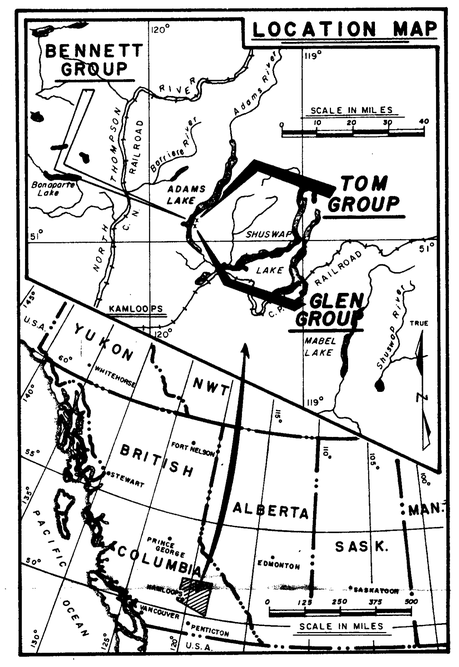
EAGLE GEOPHYSICS LIMITED
SEPT.-NOV.-1966
J. Lloyd M.Sc., Geophysicist.

Department of Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 1114 MAP

TOM GROUP

MAG.
TRUE
N

LOCATION MAP



BASELINE-'0+00'

TOM NO.-1
TOM NO.-2
TOM NO.-3
TOM NO.-4

ZONE "E"
ZONE "F"
ZONE "G"
ZONE "H"
ZONE "I"

LINE NO.-0+00
LINE NO.-4+00E
LINE NO.-8+00E
LINE NO.-12+00E
LINE NO.-16+00E
LINE NO.-20+00E
LINE NO.-24+00E
LINE NO.-28+00E
LINE NO.-32+00E

PROPOSED D.D.H. NO.-11
PROPOSED D.D.H. NO.-12
PROPOSED D.D.H. NO.-13
PROPOSED D.D.H. NO.-14
PROPOSED D.D.H. NO.-15
PROPOSED D.D.H. NO.-16
PROPOSED D.D.H. NO.-17
PROPOSED D.D.H. NO.-18
PROPOSED D.D.H. NO.-19
PROPOSED D.D.H. NO.-20
PROPOSED D.D.H. NO.-21.
PROPOSED D.D.H. NO.-22
PROPOSED D.D.H. NO.-23
PROPOSED D.D.H. NO.-24
PROPOSED D.D.H. NO.-25
PROPOSED D.D.H. NO.-26
PROPOSED D.D.H. NO.-27

B.S.#1 (450)
B.S.#2 (450)
B.S.#3 (500)
B.S.#4 (470)
B.S.#5 (500)

ADAMS LAKE

GLEN GROUP

GLEN NO.-1
GLEN NO.-2
GLEN NO.-3
GLEN NO.-4
GLEN NO.-10
GLEN NO.-11

LEGEND

MAGNETOMETER SURVEY

CONTOUR INTERVAL 100 GAMMAS
500, 1000 GAMMA CONTOUR
100 GAMMA CONTOUR
MAGNETIC DEPRESSION
BASE STATION — B.S.#2 (450)

INTERPRETATION

I.P. ANOMALOUS ZONE
IMPORTANT LINEAR I.P. TREND WITHIN ANOMALOUS ZONE
MAJOR MAGNETIC LOW
PROPOSED DIAMOND DRILL HOLE — VERTICAL, ANGLE HOLE

SYMBOLS

CREEK
TUNNEL (ADIT)
CABIN
ROAD
TRAIL
CLAIM POST AND BOUNDARY

TO ACCOMPANY REPORT BY J.LLOYD M.Sc., DATED JANUARY 9TH, 1967.

BUCHANAN MINES LIMITED

ADAMS LAKE — BRITISH COLUMBIA
KAMLOOPS MINING DIVISION

INTERPRETATION MAP
AND
MAGNETOMETER SURVEY

1114

Scale — 1"=200 Feet
0 200 400 600 800 FEET

MAP NO.-101-7, TOM GROUP GLEN GROUP

EAGLE GEOPHYSICS LIMITED
SEPT.-NOV.-1966
John Lloyd M.Sc., Geophysicist.