A&M exploration ltd.
GEOLOGY · GEOPHYSICS
MINING ENGINEERING
4570 HOSKINS ROAD, NORTH VANCOUVER, B.C.
TELEPHONE (604) 985-7921 V7K 2R1

81-1092-9854

GEOPHYSICAL REPORT
ON A
INDUCED POLARIZATION SURVEY
DES CLAIMS

NTS 92I/7E

Kamloops and Nicola Mining Divisions

Lat. 50° 25' N Long. 120° 39' W

for

Mr. Charles Boitard

9854

by

D.R. MacQuarrie

December 15, 1981 North Vancouver, B.C.

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SUMMARY AND RECOMMENDATIONS

During the period October 29 to 31, 1981, a total of 2.8 l/km of I.P. surveying was completed on the DES CLAIM.

The claims are located approximately 14.4 km east - southeast of Logan Lake, B.C. The property consists of 8 units, situated on the boundary between the Nicola and Kamloops Mining Divisions.

Nicola group volcanic rocks, intrusive plugs and stocks occur in the vicinity of the claims and some are reported to carry low grade copper mineralization. Two mineral prospects occur within 8 km, to the northwest. The major Highland Valley mines are located some 28 km. to the east - northeast.

Geological reports by Lammle (1972) and Sookochoff (1976) conclude that major northerly and northwesterly faults are indicated to occur in the vicinity of the present claims. These faults are reflected by geochemical anomalies, aeromag anomalies, topography and I.P. anomalies. Interesting mineralization is noted along these structures.

The present survey indicated the presence of a northerly to northwesterly striking zone of anomalous I.P. effects in the western part of the grid, and a weakly anomalous area coincident with the previously indicated copper geochem anomaly.

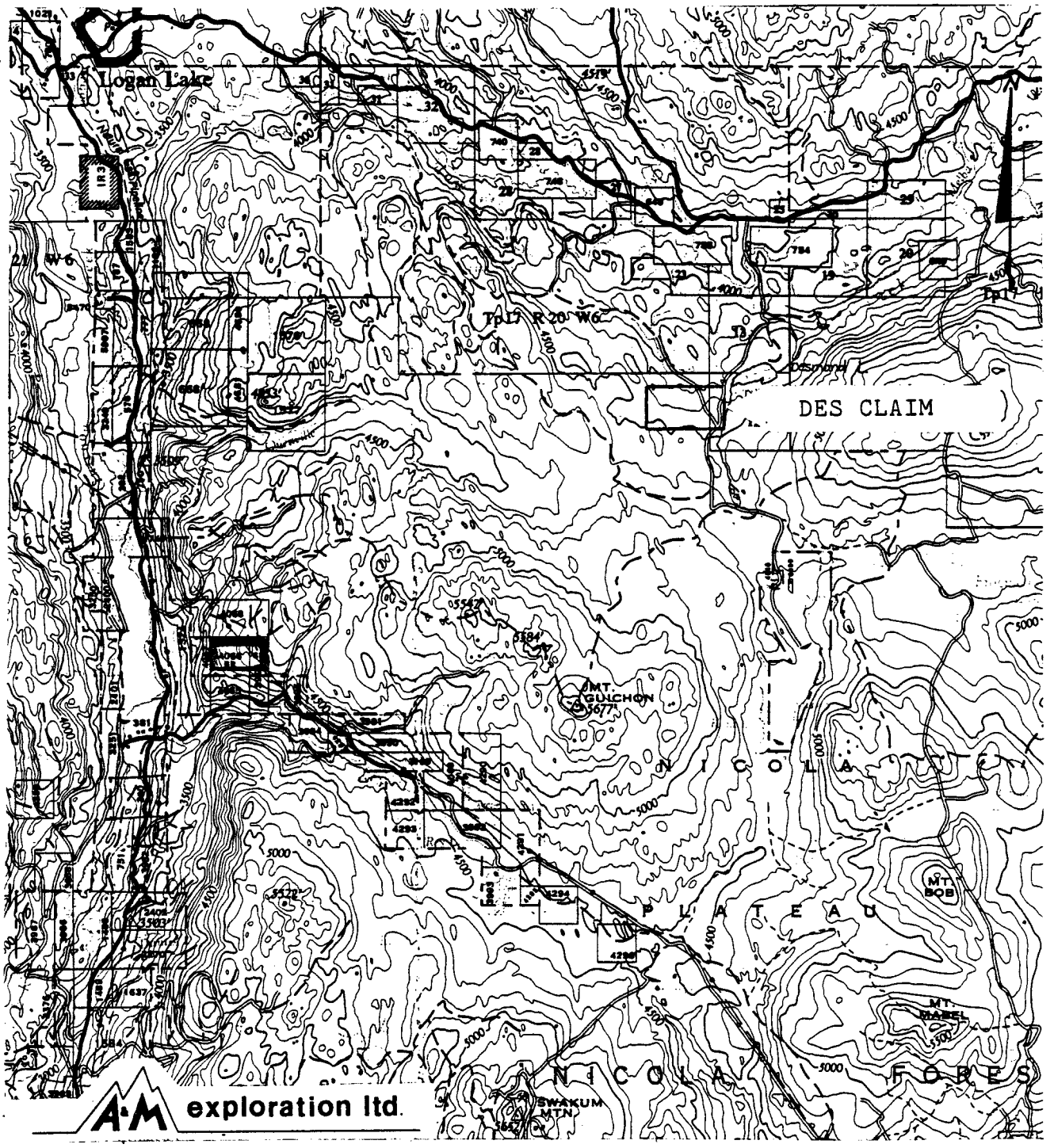
Diamond drilling of these anomalous areas is recommended, providing a geological evaluation of the anomaly area proves favourable. A two phase exploration program is suggested.

INTRODUCTION

During the period October 29 to 31st, 1981, a total of 2.8 line/km. of induced polarization survey was completed over the Des Claims, Logan Lake area, British Columbia. The claim is owned and operated by Mr. Charles Boitard of Vancouver, B.C.

The claim area is located on the boundary between the Kamloops and Nicola Mining Division at 50° 25' N latitude and 120° 39' W longitude in the Highland Valley area of south-central B.C., fig. 1 and 2. Property access is provided by travelling 14 km east of the town of Logan Lake via the Lac Le Jeune - Meadow Creek road and thence 4.5 km in a southerly direction along the Surrey Lake road. This latter road has several difficult muddy sections and therefore a 4 wheel drive vehicle is suggested.Numerous other fishing lodge and logging roads provide good access to the claim area. Recent logging activity in the vicinity of L 80 S station 120 W is believed related to right of way clearing for the B.C. Hydro transmission line proposed to run between Nicola and Kelly Lakes.

The property lies at an elevation of approximately 1350 metres in the Highland Valley area of the Thompson Plateau. The Highland Valley orebodies are located approximately 28 km to the west-northwest. The vegetation is characterized by pockets of fir in mature stands of lodgepole pine. Ground cover is generally light with numerous



Scale 1:125,000 or 1 Inch to 2 Miles approximately

Miles 1 0 2 4 6 8 10 Miles

Scale of Kilometres

1 0 2 4 6 8 10 12 14 16

Magnetic Declination approximately 23°00' East at centre of sheet, 1972.
Decreasing approximately 2' 48" annually.

Mr. Charles Boitard - DES CLAIM NTS 92I/7E

LOCATION MAP

FIG. 1

areas of very heavy deadfall. The area is drained by several small northerly flowing creeks which should provide sufficient water for exploration work. The climate is semi-arid with an average rainfall of 25 cm annually.

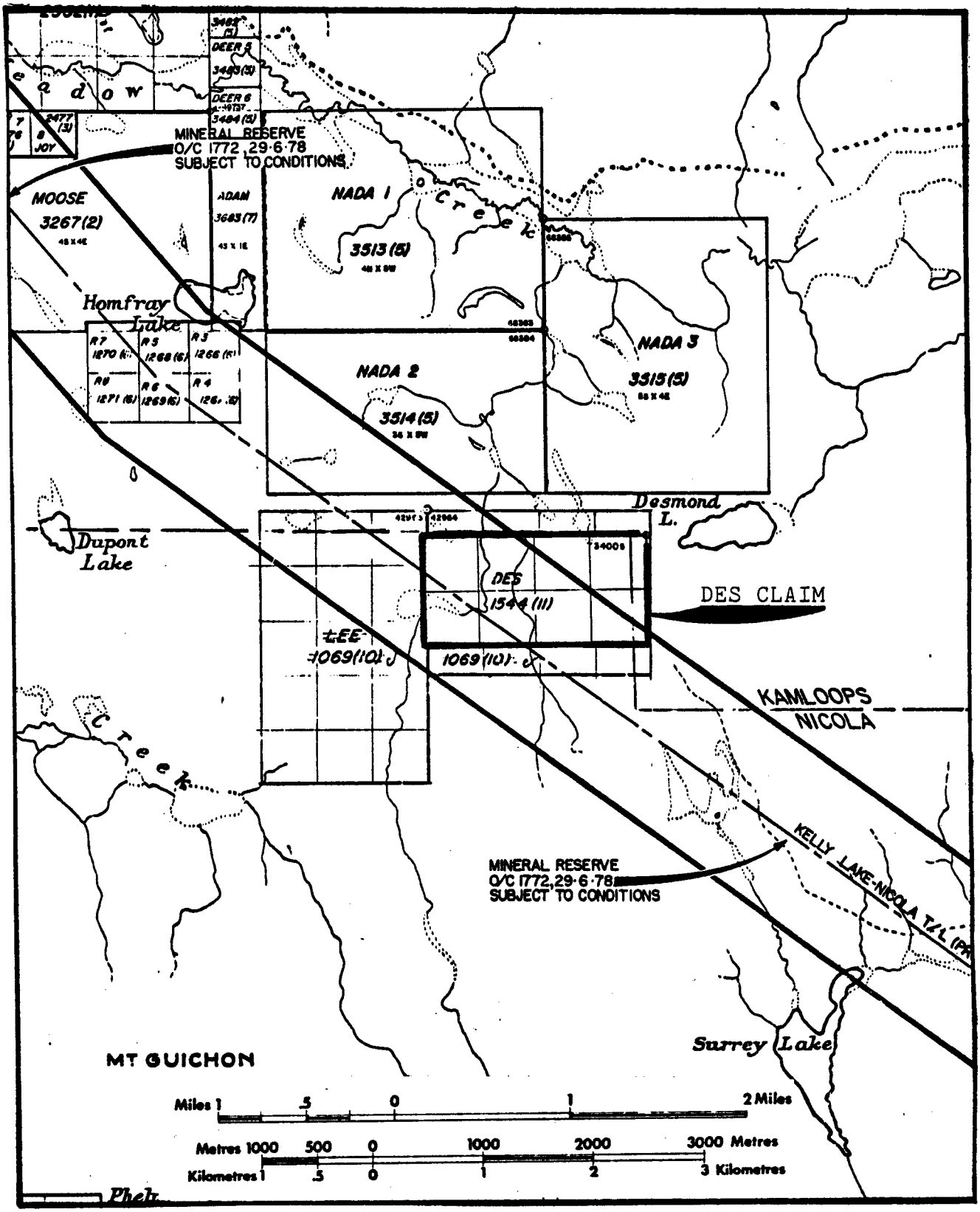
PROPERTY OWNERSHIP

The Des property, record #1544 (11), consists of eight units staked under the modified grid system, fig. 2. The legal corner post was not observed by the writer, but the one south post was noted and its location is shown on fig. 3.

The claim record form, Appendix 1, shows Mr. Charles Boitard as the owner. It is expected that acceptance of this report will extend the expiry date by two years to November 15, 1983. Sections of the Des claim are located within Mineral Reserve o/c 1772, 29-6-78, and are subject to conditions as specified in the order in council.

GENERAL GEOLOGY

The Desmond Lake area lies in a broad belt of Upper Triassic Nicola group volcanic rocks between the Guichon Batholith to the west and the Nicola Batholith to the east. The Nicola group is made up of intermediate to basic volcanic flows and breccias with minor sedimentary sub-facies. Numerous other stocks and intrusive plugs intrude the Nicola rocks.



SCALE 1 : 50,000

Mr. Charles Boitard - DES CLAIM NTS 92I/7E

CLAIM MAP

FIG. 2

In a report on the local geology Sookochoff (1976) states "the property ..." is underlain by "a variety of Nicola volcanic rock types from moderately to intensely metamorphosed with occasional recrystalization. Rock types consisted of black amygdaloidal basalt, ... grey green fine grained andesites trending northerly ... and steeply dipping. The volcanics, chloritized to various degrees generally contain either calcite stringers or splashes of calcite on fractures and are locally epidotized."

Lammle (1972) noted "granitic rock types found were medium grained, equigranular monzonite to monzonite with porphyry aspects and some fine grained fresh looking latite dykes." Volcanic rocks in proximity to the monzonite are pyritized and weakly hornfelsed. Trace amounts of chalcopyrite were found in both monzonite and hornfels." The location of these outcrops is believed to be in the southeast section of the Des claims, just west of the road.

INDUCED POLARIZATION SURVEY

In order to evaluate the grid area to a depth of 100 m it was decided that a dipole - dipole array with an 'a' spacing of 100m and 'n'= 2 would be used. A five man crew was used to accomplish the survey.

INSTRUMENTATION

The induced polarization equipment used was of the frequency domain type, manufactured by Sabre Electronic Instruments Ltd. of Burnaby, B.C. The system has a maximum power output of 500 watts from a 12 volt lead-acid battery supply. Frequencies are variable from 0.1 to 10 hz.

The induced polarization method is based on the electrochemical phenomenon of overvoltage that is, on the establishment and detection of double layers of electrical charge at the interface between ionic and electronic conducting material when an electric current passes across the interface.

Naturally occurring sulphides such as pyrite, oxides such as magnetite, graphite as well as certain clay minerals,

sericite and chlorite give rise to induced polarization responses. These responses are generally characteristic of certain rock or soil types.

The frequency domain method is based on the fact that I.P. effects are greater at lower frequencies and therefore the change of measured resistivities with frequency is an indication of the polarization effects. The factor measured is called the 'Percent Frequency Effect' or PFE and is defined as:

$$PFE = \frac{R_1 - R_2}{R_1} \times 100$$

where R_1 and R_2 are the apparent resistivities at the lower and higher frequencies used. This factor is directly read by the I.P. receiver.

The apparent resistivities were calculated for each station, using the following formula for a dipole-dipole array:

$$Pa = \pi \cdot a \cdot n\ (n+1)\ (n+2)\ \frac{Vp}{I}$$

where Pa = apparent resistivity, ohm metres

a = a spacing = dipole length, metres

n = number of dipole lengths between the transmitter electrode and the receiver porous pot.

Vp = primary voltage across receiver porous pots (millivolts).

I = transmitter current, (milliamps).

SURVEY PROCEDURE

The IP survey was conducted over a previously located grid. The new grid, shown on fig. 3, is comprised of east west lines at 100 m intervals and 50 m station intervals. Line 50 S bisects the Des Claim. The old grid, established circa 1972, is still discernible. These lines were cut at a bearing of 55°, on 800 foot centers with 100 foot station intervals.

The dipole-dipole array was selected for the survey. An 'a' spacing of 100 m with 'n' equal to 2 was used throughout. Frequencies of 0.3 and 10 hz were selected. Stainless steel current electrodes were used for the transmitter dipole and non-polarizing copper sulphate - copper electrode half cells (pots) were used for the receiver dipole. All anomalous PFE readings (greater than 3.0%) were double checked. The measured PFE, Vp and I were recorded for each station. The plan maps of the PFE and Apparent Resistivity Values are shown on fig. 3 and 4.

SURVEY RESULTS AND INTERPRETATION

The survey results are plotted on fig. 3 and 4. In order to aid in the interpretation, data from a 1977 IP survey by Glen White Geophysical was also compiled onto the map. In order to fit the two sets of data, it was necessary to divide the Glen White chargeabilities (msec.) by a factor of 2 to yield PFE, and to multiply the resistivities (ohm feet) by 0.3048 to yield ohm metres. In areas where the

two surveys intersect, the calculated IP and resistivity values match remarkably well considering the differences in equipment type and array used.

Two areas of anomalous IP effect have been delineated. The largest is located between L 50 S and L 80 S at stations 130 W to 120 W respectively. The values reach a maximum of 6.5 PFE, or approximately three times background. The zone is open to the north and south, and is trending in a north-northwesterly direction. Resistivity values in this area indicate a possible contact zone as evidenced by the step in the data from 200 to greater than 300 ohm metres. A previous magnetometer survey (Mark, 1980) indicates a magnetic gradient in the area of the 200 ohm metre contour located just east of the anomalous IP zone. Overburden conditions and a light snow cover at the time of the survey prevented any geological examination of the anomaly area, and therefore interpretation of the source of the anomaly is difficult. Two possible causes are suggested below:

1. a zone of pyrite $\pm$ chalcopyrite mineralization in Nicola Volcanics located within 100 m of the surface - similar to the anomaly described by Sookochoff - "A former IP survey on the Dupont property" (located some 4 km west-northwest) "reflected northerly trending anomalies centered generally along a northwesterly trending zone. A drill hole on one of these anomalous highs was reported to intersect massive pyrite with sub-grade copper values."

2. a concentration of weakly polarizable minerals such as chalcocite (on bedding planes in the volcanics) bornite, sericite, cuprite, and/or magnetite in a northerly trending fracture zone.

Pyritic volcanic rocks with trace amounts of chalcopyrite have been observed at the south end of the copper geochem anomaly located near the southeast corner of the claims (Lammle, 1972).

The second anomalous area is located in the vicinity of L 50 S station 50 W. The values are only slightly anomalous reaching 4 PFE. The anomaly is apparently of limited areal extent as it is not evident on the 1977 IP results. It is underlain by a local resistivity high feature and is in the area of the previous copper geochemical anomaly. It may be related to pyrite and/or chalcopyrite in volcanic rocks as noted by Lammle, above.

In order to further define drill targets, detailed geological mapping of the claim area is suggested. If the geology of the anomaly area proves favourable a drill program would be warranted. Further IP and magnetometer work to cover the entire Des claim is also recommended.

Respectfully submitted,

D.R.MacQuarrie
Geophysicist

REFERENCES

Lammle, C.A.R. (1972). Geochemical Report on Des 1-98 Mineral Claims. B.C. Dept. Mines Assessment Report, 4057.

Mark, D.G. (1980). Geophysical Report on VLF EM and Magnetomenter Surveys, Des Claim. April 29, 1980, Private Report.

Sookochoff, L. (1976). Geological Report on the Desmond Lake Property. October 12, 1976, Private Report

White, G. (1977). IP and Resistivity Test Profiles Plates 1 to 4. Private Report. 5/6/77.

CERTIFICATE

I, Douglas R. MacQuarrie, of the City of Surrey in the Province of British Columbia, do hereby certify that:

1. I am a Consulting Geophysicist of A & M Exploration Ltd., with offices at 4570 Hoskins Road, North Vancouver, B.C.

2. I am a graduate of the University of British Columbia with a degree in Geology and Geophysics. (B.Sc., 1975)

3. I have been practising my profession since 1975 and have been active in the mining industry since 1971.

4. I am an active member of the Canadian Institute of Mining and Metallurgy and a member of the British Columbia Geophysical Society.

5. The geophysical data presented in this report was obtained under my direct supervision.

6. I hold no interest in the DES CLAIM, nor do I intend to receive any as a result of writing this report

7. I consent to the use of this report for a prospectus or in a statement of material facts.

D.R. MacQuarrie

December 15, 1981.

Douglas R. MacQuarrie
Geophysicist

STATEMENT OF COSTS

I, Douglas R. MacQuarrie, a geophysicist with A & M Exploration Ltd., do hereby certify that work to the value of the following was carried out on the DES CLAIM, Kamloops and Nicola Mining Divisions, British Columbia :

FIELD WORK

2 days Induced Polarization surveying,	
Total cost	$2,300.00

MOB - DEMOB

Total cost	1,467.07

REPORT

Geophysicist, 1.5 days @ $300.00 per day	450.00
Draughting, 7 hours at $15.00 per hour	105.00
Compilation, typing and photocopying	90.00
TOTAL COST	$4,412.07

Respectfully submitted,

D.R.MacQuarrie
Geophysicist

PROPOSED EXPLORATION PROGRAM

PHASE I

Geologist, 5 days at $400.00 per day	$2,000.00
Mob - demob	300.00
Room and board	200.00
Report	1,000.00
Total Phase I	$3,500.00

PHASE II

I.P. and magnetometer surveys, to cover the entire property, 'a' spacing 50m, 'n'= 1,2. Total cost	25,500.00
Diamond drilling, estimate 600 feet at a total cost of $35.00 per foot	21,000.00
Total Phase II	$46,500.00
TOTAL PHASE I & II	$50,000.00
plus 10% contingencies	$55,000.00

APPENDIX 1

Claim Record Form

MINERAL ACT - PROVINCE OF BRITISH COLUMBIA

Record of Mineral Claim
FORM G

MAP NO. 92I/7B

RECORD NO. 1544

MINING RECEIPT NO. 1280428 RECORDED AT Kamloops THIS 15 DAY OF November 1978

Kamloops

DO NOT WRITE IN SHADED AREAS

Gold Commissioner

Affidavit for Mineral Claim

I, Vic Doucet (NAME) AGENT FOR Charles Boitano (NAME)

2259 Crescent Dr. Kam. (ADDRESS) 2245 W 13th Ave Van. (ADDRESS)

VALID SUBSISTING F.M.C. NO 170833 VALID SUBSISTING F.M.C. NO. 159-725

MAKE OATH AND SAY:- I COMMENCED LOCATING THE DES MINERAL CLAIM

ON THE 25 DAY OF Oct. 1978 AT 10:05 AM (TIME - INDICATE A.M. OR P.M.) AND COMPLETED THE LOCATION

ON THE 25 DAY OF Oct. 1978 AT 4:50 PM (TIME - INDICATE A.M. OR P.M.) CONSISTING OF

4 (NUMBER) UNIT LENGTHS W (DIRECTION) AND 2 (NUMBER) UNIT LENGTHS South (DIRECTION) AND I HAVE IMPRESSED ALL THE REQUIRED INFORMATION

ON METAL TAGS NO. 34005 WHICH HAS BEEN SECURELY FASTENED TO THE POSTS AS REQUIRED UNDER THE REGULATIONS

IDENTIFICATION POST(S) NOT PLACED WERE

CHECK "✓" APPLICABLE SQUARE

[X] THE LEGAL CORNER POST
† [ ] THE WITNESS POST FOR THE LEGAL CORNER POST

IS SITUATED: 450 meters

West of Desmond Lake

PRECISELY DESCRIBE POSITION OF POST RELATIVE TO KNOWN TOPOGRAPHICAL OR SURVEYED FEATURES THAT RELATE TO FEATURES ON A MAP

† BEARING AND DISTANCE TO TRUE POSITION OF LEGAL CORNER POST FROM THE WITNESS POST °

BEARING AND DISTANCE FROM IDENTIFICATION POST TO WITNESS POST °

I HAVE COMPLIED WITH ALL THE TERMS OF THE MINERAL ACT AND REGULATIONS PERTAINING TO THE STAKING OF MINERAL CLAIMS AND HAVE ATTACHED A PLAN, ACCEPTABLE TO THE MINING RECORDER, OF THE LOCATION

SWORN AND SUBSCRIBED TO AT Kamloops

THIS 15 DAY OF November 1978 BEFORE ME

(SIGNATURE)

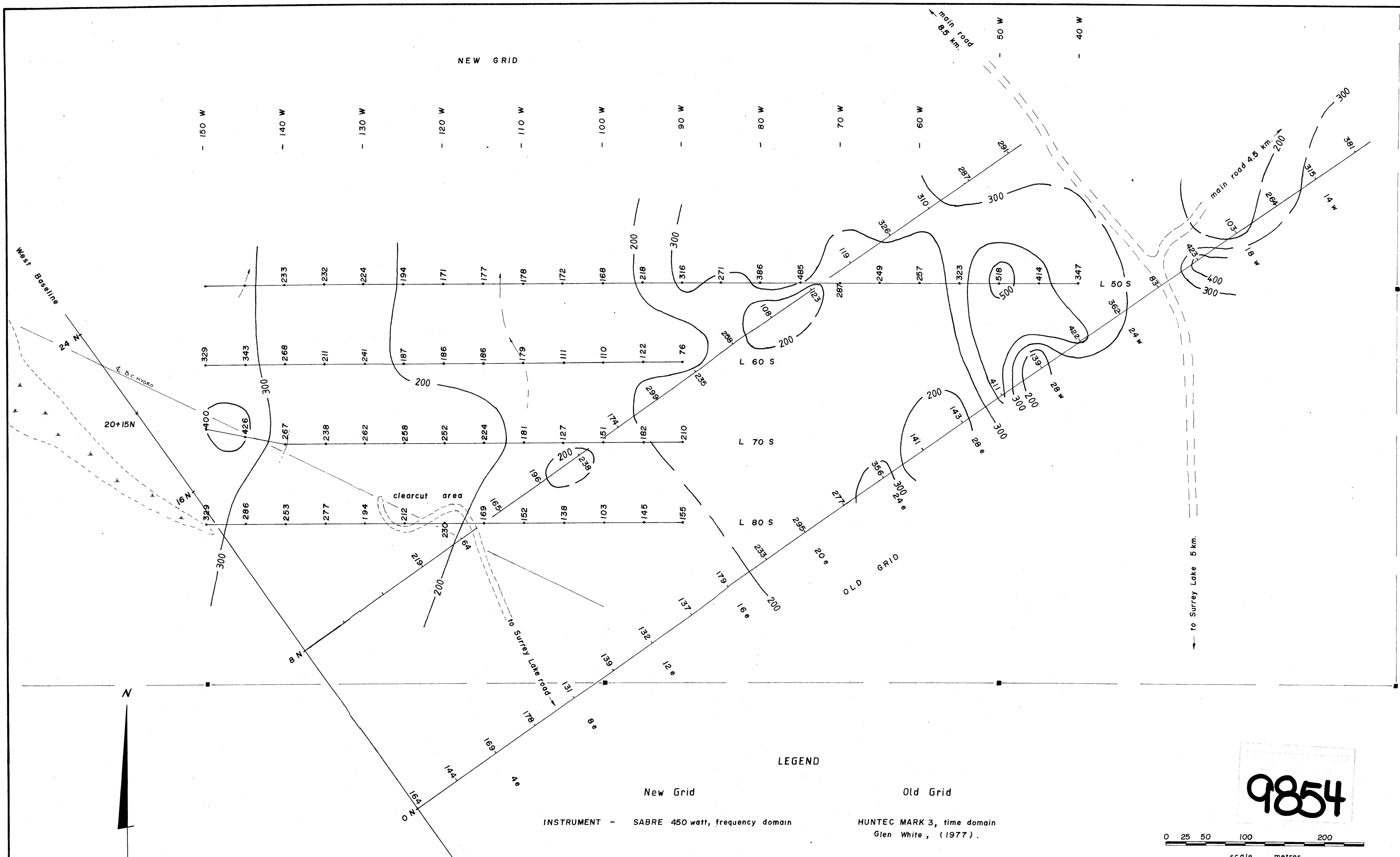
* THIS AFFIDAVIT MAY BE TAKEN BY A PERSON EMPOWERED TO TAKE AFFIDAVITS BY THE EVIDENCE ACT OF BRITISH COLUMBIA.

GOLD COMMISSIONER
121142E
NOV 15 1978
41.00
KAMLOOPS
BRITISH COLUMBIA

NO. OF UNITS 8

WORK NUMBERS	C/L IN $	MINING RECEIPT AND DATE RECORDED	TYPE OF WORK	YEAR OF EXPIRY	CREDIT WORK UNITS	CREDIT RENTAL IN $'S	TRANSFERS (B.S.'S, ASSIGNMENTS, CONVEYANCES)
SURVEY PENDING				4/1 4371/80			No 13151 To Mike D. Stad...
		2 yrs.		Nov 15			
5517-532		Nov 13/79	G	1981			
SURVEY PENDING				4/1 5590/81			

COPY



LEGEND

	New Grid	Old Grid
INSTRUMENT –	SABRE 450 watt, frequency domain	HUNTEC MARK 3, time domain Glen White, (1977).
ARRAY –	Dipole – Dipole, a = 100m, n = 2	Pole – Dipole, a = 400', n = 1

– For comparison purposes 1 % F.E. ≅ 2 msec.

– " " " ohm metre = ohm feet · 0.3048

0 25 50 100 200

scale metres

Charles Boitard

APPARENT RESISTIVITY COMPILATION MAP DES CLAIM

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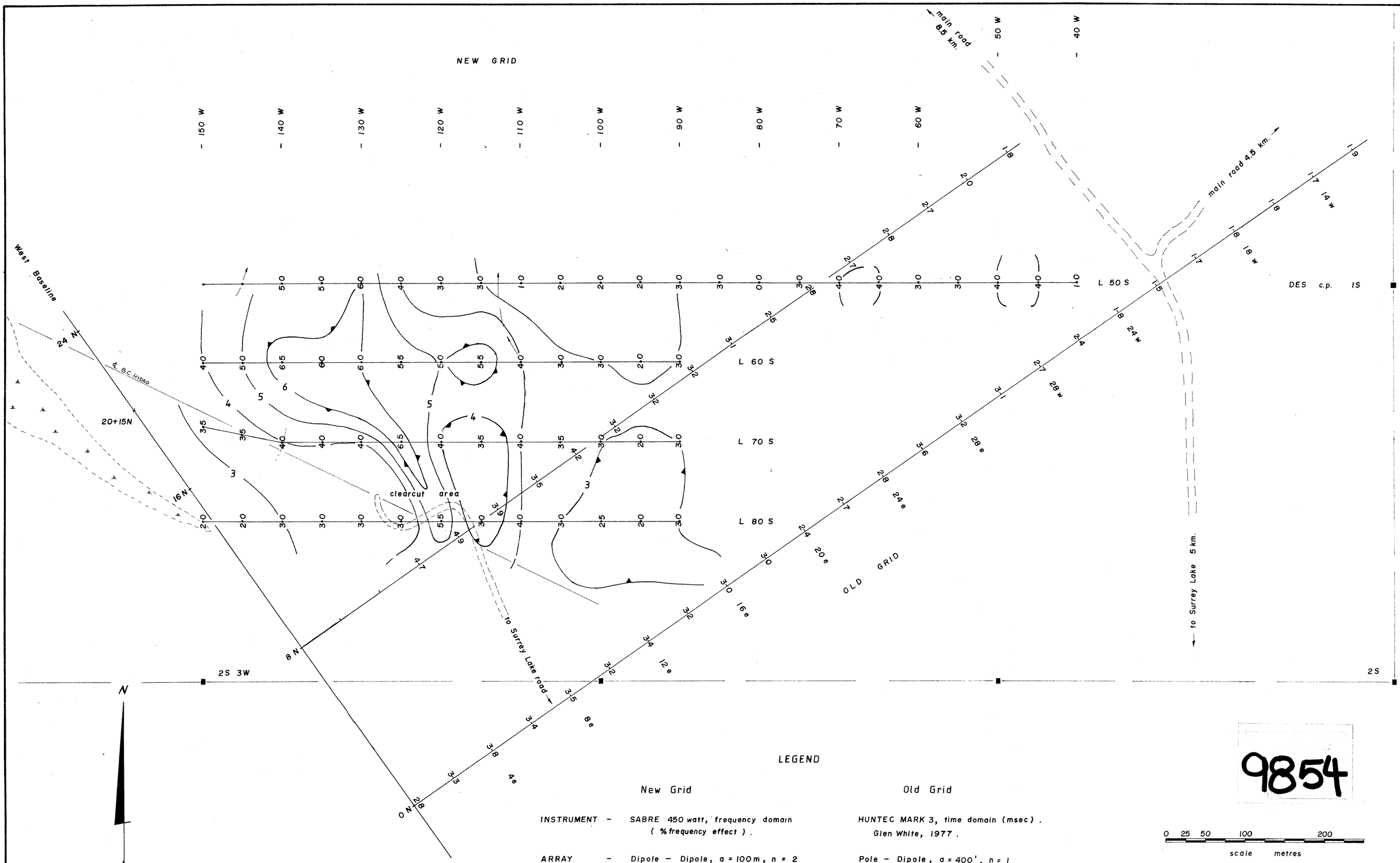
scale 1 : 2,500	NTS 92 I/7E	FIG. 4
date October, 1981		



LEGEND

	New Grid	Old Grid
INSTRUMENT –	SABRE 450 watt, frequency domain (% frequency effect).	HUNTEC MARK 3, time domain (msec). Glen White, 1977.
ARRAY –	Dipole – Dipole, a = 100m, n = 2	Pole – Dipole, a = 400', n = 1
FREQUENCY –	0.3 and 10 c.p.s.	
–	For comparison purposes 1% F.E. ≅ 2 msec.	

ohm metre = ohm feet • 0.3048

9854

0 25 50 100 200

scale metres

Charles Boitard

INDUCED POLARIZATION COMPILATION MAP DES CLAIM

A·M exploration ltd.

scale 1 : 2,500	NTS 92I/7E	FIG. 3
date October, 1981		