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GEOPHYSICAL REPORT

ON AN

INDUCED POLARIZATION SURVEY

MIN CLAIM GROUP

MINNIE LAKE AREA, NICOLA M.D., B.C.

MIN CLAIM GROUP : 32 km S70E of Merritt, B.C. and 4 km E of Minnie Lake

: 50° 120° SE

: N.T.S. 92I/1W

WRITTEN FOR : Dakota Energy Corporation
403-750 West Pender Street
Vancouver, B.C., V6C 2T7

BY : David G. Mark
GEOTRONICS SURVEYS LT
403-750 West Pender S
Vancouver, B.C., V6C

DATED : December 10, 1980

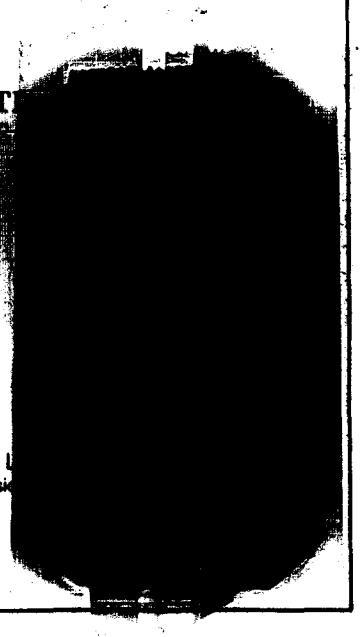

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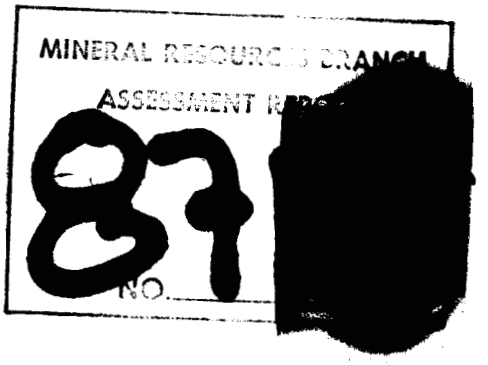
TABLE OF CONTENTS



SUMMARY	i
CONCLUSIONS	i
RECOMMENDATIONS	ii
INTRODUCTION AND GENERAL REMARKS	1
PROPERTY AND OWNERSHIP	2
LOCATION AND ACCESS	2
PHYSIOGRAPHY	3
HISTORY OF PREVIOUS WORK	3
GEOLOGY	3
INSTRUMENTATION AND THEORY	5
SURVEY PROCEDURE	6
COMPILATION OF DATA	7
DISCUSSION OF RESULTS	8
GEOPHYSICIST'S CERTIFICATE	11
CERTIFICATE OF EXPENSES	12

MAPS - at back		FIGURE
Location Map	1:8,600,000	1
Claim Map	1:50,000	2

MAPS - in pocket		SHEET
Induced Polarization Survey Resistivity - Data and Contours	1:3,000	3
Induced Polarization Survey Frequency Effect - Data and Contours	1:3,000	4
Induced Polarization Survey Pseudo-Sections - Data and Contours	1:3,000	5

SUMMARY

An induced polarization survey was carried out over the central part of the MIN Claim Group during the first week in July, 1980. The MIN Claims are located 4 km east of Minnie Lake in the Nicola Mining Division. Access is via 50 km of highway and dirt road from the town of Merritt, B.C. The terrain is fairly gentle and vegetation is that of open forests and grassland.

The claims were only recently staked and therefore the only work done to date is a soil geochemistry survey. The object of the I.P. survey was to locate potential zones of copper and molybdenum sulphides.

The property is underlain by granodiorites and quartz diorites of the Penask Batholith which is of the Coast Intrusions. The mineralization occurs as copper and molybdenum sulphides contained in fine fractures.

The I.P. equipment used was frequency domain type with a dipole-dipole array of 60 meter dipole length. The readings were taken at one separation and three separations every 60 m on lines 100 m apart. Frequency effect and resistivity data were plotted on pseudo-sections, and plan-type maps and subsequently contoured.

CONCLUSIONS

1. The I.P. survey has revealed several small anomalies, most of which correlate with copper and molybdenum anomalies.

2. Two of the more promising anomalies are D and F because of the encouraging correlation of I.P. highs, resistivity lows, copper soils, and molybdenum soils.

3. Anomaly A is a fairly large low amplitude anomaly that does not correlate directly with soil geochemistry highs. It is suggested therefore that its causitive source is pyritization associated with nearby copper and molybdenum mineralization.

4. The resistivity highs on the property suggest intrusive dykes.

RECOMMENDATIONS

1. The next stage in Kelly's report is diamond drilling. Drill targets are starting to shape up, especially anomalies D and F. However, the writer feels more detailed and more extensive I.P. work around these 2 anomalies should be carried out.

2. Accompanying this should be geological mapping, even though the outcrops may be sparse.

3. Consideration should be given to running a VLF-EM survey over the property for the purpose of mapping fault and shear zones. Some of the geochemical anomalies are long and lineal suggesting a fault or shear is related to the causitive source.

GEOPHYSICAL REPORT

ON AN

INDUCED POLARIZATION SURVEY

MIN CLAIM GROUP

MINNIE LAKE AREA, NICOLA M.D., B.C.

INTRODUCTION AND GENERAL REMARKS

This report discusses the survey procedure, compilation of data, and the interpretation of an induced polarization (I.P.) survey carried out over the 2 MIN Claims for Dakota Energy Corporation, from July 1st to July 8th, 1980.

The field work was carried out by R. Fassler and four assistants. A total of 10 km at one separation and 3 km at 3 separations was completed for a total of 13 km.

The purpose of the survey was to test soil geochemistry anomalies in molybdenum and copper from a survey completed earlier in the year.

Prior to the I.P. work, the lines were cut out by chainsaw and picketted. This was necessary due to heavy underbrush in parts of the property.

PROPERTY AND OWNERSHIP

The property is comprised of two contiguous claims, both named MIN, containing 15 units as shown on the claim map and as described below:

CLAIM	NO. UNITS	RECORD NO.	EXPIRY DATE
MIN	9	665	July 23, 1987
MIN	6	733	Sept. 26, 1987

The expiry date remains as shown only if the work applied for assessment credits is accepted.

The property is wholly owned by Dakota Energy Corporation.

LOCATION AND ACCESS

The property is located about 4 km east of Minnie Lake and 32 km S70E of the town of Merritt, British Columbia. The geographical coordinates are 50° 01'N latitude and 120° 20'W longitude.

The access can be gained by 2-wheel drive vehicle. The access description is quoted from Kelly's engineering report on the MIN Claims; "Highway 5 (Merritt-Kamloops Highway) is followed northeasterly out of Merritt for about 24½ km to a turn-off to the right (south) on a gravel road marked Paradise Lake and Pennask Lake. This road continues southerly across the plateau, and at about 18½ km there is a turn-off to the left (east) to Douglas, Paradise and Pennask Lakes. This is followed for some 3.9 km to yet another turn-off, the Pennask Road, leading to the right (south). 1.6 km along this road there is an unmarked fork; take the left branch, the Wasley Creek road. About 1 km further, the road goes through a wire fence running N 45° E. About 7½ m southwesterly of the cattle-guard gate, the legal post of the

first MIN claim stands alongside the fence".

PHYSIOGRAPHY

The MIN Claims lie in the southern part of the physiographic division known as the Thompson Plateau which is part of the Interior Plateau System. The property lies on the Douglas Plateau on which the terrain is generally that of flat or rolling hills. Elevations vary from 1,100 meters a.s.l. in the northwest corner to 1,350 meters a.s.l. in the southeast corner to give a relief of only 250 meters.

The main water source is Wasley Creek and its tributaries. Wasley Creek flows westerly across the northern part of the property. A small lake is located 2 km to the west.

Vegetation on the property is that of open coniferous timber and grasslands. Dense underbrush occurs over much of the property as well.

HISTORY OF PREVIOUS WORK

Since the claim was staked, a soil geochemistry survey was carried out by V.L. Paulger and Associates. The report is presently being prepared by Sherwin Kelly.

GEOLOGY

The following is quoted from Kelly's report; "The MIN Claim is located within agranitic mass of Coast Intrusives of Middle Jurassic to Upper Cretaceous age. This particular body is shown in the southeast corner of geological Map 886A, "Nicola", accompanying Memoir 249 of the Geological Survey of Canada, "Geology and Mineral Deposits of the Nicola Map-Area, British Columbia" by W.E. Cockfield, Ottawa, 1948. The name "Penask

Batholith" is given the body in that report. It is reported to consist of grey to pink, medium to coarse grained granodiorites to quartz diorites. The Minnie Lake area lies close to the western end of this east-west oval shaped mass.

"Some 18 miles southeast of the MIN CLaim, the Brenda Mine is producing copper-molybdenum ore from a deposit in the southeast portion of this Penask Batholith. Mineralization at Brenda occurs in faults and fractures, in the form of separate grains, bunches and platy networks of chalcopyrite, pyrite and molybdenite occupying quartz or quartz-microcline veins and veinlets in the fractures. The molybdenite, however, tends to occur largely in subsidiary, cross fractures and spectacular, platy molybdenite is sometimes found in veinlets in altered wall-rock.

"At start-up, nearly ten years ago, Brenda had an orebody of 177,000,000 tons grading 0.183% copper and 0.049% molybdenum, with a central core of 26 million tons grading approximately 20% higher".

"It is important to note that surface oxidation and leaching extend to variable depths, sometimes in excess of twenty feet. In consequence, samples taken in early trenches and pits and by X-ray drills, yielded low, unrepresentative assays. Such a situation might also result in lowered, unrepresentative geo-chemical soil samples."

"Outcrops are not abundant in this rolling topography, but there are a few exposures, mainly on hillsides, in which the grey quartz diorite is evident. It exhibits fine fractures, many occupied by quartz veinlets, which may carry copper and molyb-denum sulphides. The fractures, some so fine as to be hardly noticeable, are usually spaced only a few inches apart.

"Three such outcrops lie in a grassy area sloping down from the access road northwest to the bed of a creek. Each had, at some time, been blasted with probably one or two holes, but without cleaning out the muck. The blasted fragments exhibit the type of fractures mentioned above and carry veinlets with scattered chalcopyrite and occasional molybdenum".

INSTRUMENTATION AND THEORY

The induced polarization equipment used was frequency-domain type manufactured by Sabre Electronic Instruments Ltd. of Burnaby, B.C. A 12-volt lead-acid battery was used for a power source to give a power potential of 500 watts.

The transmitter output voltage is 125, 250, 375 and 500 volts with selection by a switch. The transmitter current varies up to 1,000 milliamperes. The self-potential buckout is operated manually by a 10-turn precision pot with a range of $\pm$ 1 volt.

There are basically two methods of I.P. surveying, frequency domain and time domain. Both methods are dependent on a current flowing across an electrolyte-electrode interface or an electrolyte-clay particle interface, the former being called electrode polarization and the latter being called membrane polarization.

In time-domain electrode polarization, a current is caused to flow along electrolyte-filling capillaries within the rock. If the capillaries are blocked by certain mineral particles that transport current by electrons (most sulphides, some oxides, graphite), ionic charges build up at the particle-electrolyte interface, positive ones where the current enters the particle, and negative ones where it leaves. This accumulation of charge creates a voltage that tends to oppose the current flow across the interface. When this current is stopped, the created voltage

slowly decreases as the accumulated ions diffuse back into the electrolyte. Thus is produced the induced polarization effect.

In membrane polarization a similar effect occurs. A charged clay particle attracts opposite charged ions from the electrolyte in the capillary around the particle. If a current is forced through the capillary, the charged ions are displaced. When the current is stopped, the ions slowly diffuse back to the same equilibrium state as before the current flow. This explains I.P. anomalies where no metallic-type minerals exist.

Frequency domain I.P. is based on the fact that the resistance produced at the electrolyte-charged particle interface decreases with increasing frequency. The parameter commonly used for measuring frequency-domain induced polarization is frequency effect. The one used for time-domain is chargeability.

In the process of carrying out an I.P. survey, two other geophysical methods are used and measured. These are self-potential (S.P.) and resistivity. The S.P. must be nulled by I.P. receiver in order to obtain accurate I.P. measurements and is a measure of the 'battery action' of the ground. The resistivity value is calculated from the voltage and current readings obtained while measuring the I.P. effect and therefore can be utilized to determine how resistive (or conductive) the ground is.

SURVEY PROCEDURE

The dipole-dipole array was used with an electrode spread (or dipole length) of 60 m at 1 separation for 10 km and at three separations (n = 1, 2, 3) for 3 km giving a total of 13 km. The two frequencies used were 0.3 Hz and 10 Hz.

Non-polarizing, unglazed porcelain pots with a copper electrode

and copper sulphate electrolyte were used for the potential electrodes. Stainless steel stakes were used for the current electrodes.

Readings were taken every 60 m on 100 m separated north-south trending lines.

COMPILATION OF DATA

1. Percent frequency effect (P.F.E.) - this is the actual measure of the induced polarization effect in a frequency domain survey. The term is derived from the percentage charge in the electrode-electrolyte transfer impedance at the two different frequencies. The disseminated sulphide body would cause a large change. This property is measured directly in the field.

   The P.F.E. was plotted in pseudo-section form on Sheet 5 for the 3 separation as well as in plan form on Sheet 3. The maps were drawn at a scale of 1:3,000. The contour interval was 1% beginning at 4%. The 4% contour was dashed since the writer felt that it was only possibly anomalous. Contours 5% and above were drawn in solid meaning these contours were definately anomalous.

2. Resistivity - this is a measure of how resistive, or inversely, how conductive the overburden and/or bedrock is. Most often a disseminated sulphide body is expressed by a resistivity low. The resistivity values in ohm-meters were arrived at by dividing the receiving voltage by the transmitter current and multiplying by a geometric factor peculiar to the dipole-dipole array with a dipole length of 60 m and a dipole separation of n = 1 (or 2, or 3 as the case may be).

The values were plotted on Sheet 5 in pseudo-section form with the frequency effect pseudo-sections as well as in plan form for n = 1 on Sheet 4. The values were contoured at a 45 ohm-meter interval with those contours 70 ohm-meters and less, dashed, and contours 60 ohm-meters and above, solid.

The 45 ohm-meter contour interval was determined by statistical analysis and is the equivalent of 1 standard deviation. The mean background value was determined to be 115 ohm-meters.

DISCUSSION OF RESULTS

The induced polarization survey has revealed several anomalies across the survey area. Considering that the background is about 3% and the highest values in each anomaly is 5 to 6% (except for one 7%), the anomalies are somewhat low in amplitude. However, the I.P. response over parts of the Brenda orebody, which occurs in the same Penask Batholith was not that strong either.

The I.P. anomalies have been labelled by the letters A to I according to their correlation or near correlation with the soil geochemistry results. There is no B I.P. anomaly, however, and anomalies H and I correlate with unlabelled soil geochemistry anomalies.

Anomaly A is the largest anomaly in area as well as having a good depth extent. The eastern half correlates with a resistivity low and the western with the edge of a resistivity high. Direct correlation with soil geochemistry anomalies is poor, but these do occur all around anomaly A. A probable explanation is that the I.P. is responding to pyritization associated with the causitive sources of the soil geochemistry anomalies (principally copper).

Anomaly C, seen only on the pseudo-section of line 5 correlates

with a small copper anomaly and a strong molybdenum anomaly. The correlating resistivity values are background.

Anomaly D is considered by the writer to be one of the more interesting anomalies. It correlates with a fairly strong, but small, copper and molybdenum soil geochemistry anomaly as well as a resistivity low.

Anomaly E is a low amplitude one that correlates with low amplitude geochemistry values. The resistivity correlation is a high.

Anomaly F is also of particular interest. It correlates with a strong copper and molybdenum anomaly that is long and lineal. The I.P. survey readings were taken over only 2 lines, but the soil geochemistry anomaly occurs on several lines giving a possible length of over 500 m. The resistivity correlation is a low.

Anomaly G contains the highest readings on the property but the anomaly is small. However, it is open to the north and correlates with a resistivity low. Adjacent to the I.P. anomaly is a molybdenum anomaly.

Anomaly I is a low amplitude anomaly with depth that correlates with a low amplitide copper anomaly. There is a correlating resistivity low.

Anomaly H is strong, but small, and correlates with a copper anomaly. It occurs on the edge of a resistivity high.

The resistivity highs on the property are long and lineal suggesting the causitive sources may be intrusive dykes that

are more electrically resistive than the country rock.

December 11, 1980

Respectfully submitted,
GEOTRONICS SURVEYS LTD.

David G. Mark,
Geophysicist

GEOPHYSICIST'S CERTIFICATE

I, DAVID G. MARK, of the City of Vancouver, in the Province of British Columbia, do hereby certify:

That I am a Consulting Geophysicist of Geotronics Surveys Ltd., with offices at #403-750 West Pender Street, Vancouver, British Columbia.

I further certify:

1. I am a graduate of the University of British Columbia (1968) and hold a B.Sc., degree in Geophysics.

2. I have been practising my profession for the past twelve years and have been active in the mining industry for the past fifteen years.

3. I am an active member of the Society of Exploration Geophysicists and a member of the European Association of Exploration Geophysicists.

4. This report is compiled from data obtained from an induced polarization survey carried out by R. Fassler as crew chief, and four assistants, during July, 1980 on the MIN Claim Group.

5. I am a director of Dakota Energy Corporation. I do not hold any shares but will be purchasing some. This will not be as a result of writing this report.

David G. Mark

December 11, 1980

CERTIFICATE OF EXPENSES

I, DAVID G. MARK, Manager of Geotronics Surveys Ltd. certy the Induced Polarization Survey and Linecutting was carried out between the dates of July 1st and July 8th, 1980 on the MIN Claim Group was done to the values of the following:

LINECUTTING	
2-man crew, 62 hours at $24/day	$ 1,488.00
Truck rental and gas	513.00
Room and board	440.00
	$ 2,441.00
I.P. SURVEY	
5-men (geophysical technician and four helpers) and instrument rental for 8 days at $800/day	6,400.00
4-wheel drive rental and gas	443.00
Room and board	1,232.00
Survey supplies	75.00
Report	2,000.00
	$ 10,150.00
Grand Total	$ 12,591.00

Respectfully submitted,
GEOTRONICS SURVEYS LTD.

David G. Mark,
Geophysicist

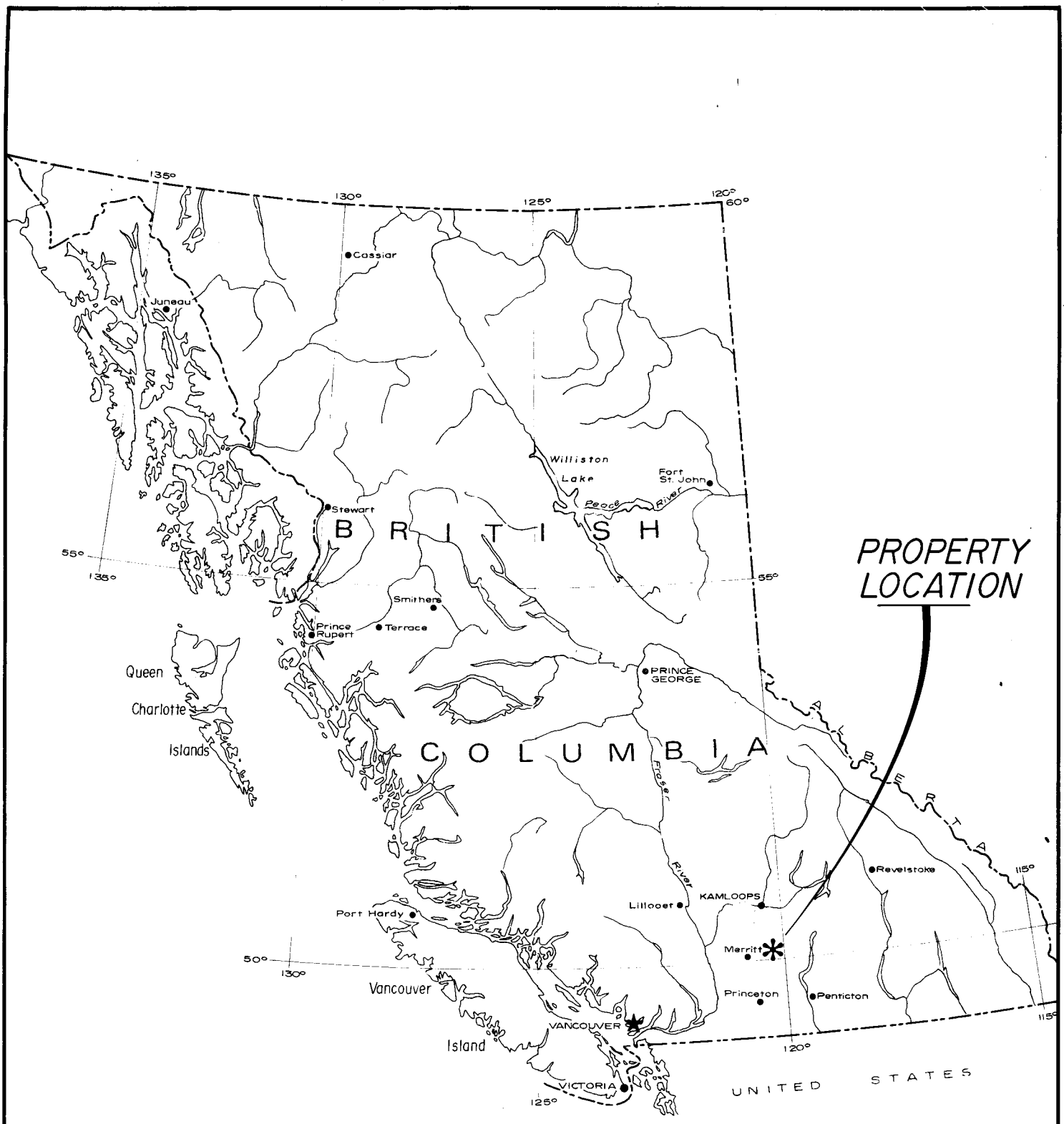


FIG. 1

GEOTRONICS SURVEYS LTD.

DAKOTA ENERGY CORPORATION

MIN CLAIMS

MINNIE LAKE AREA, NICOLA M.D., B.C.

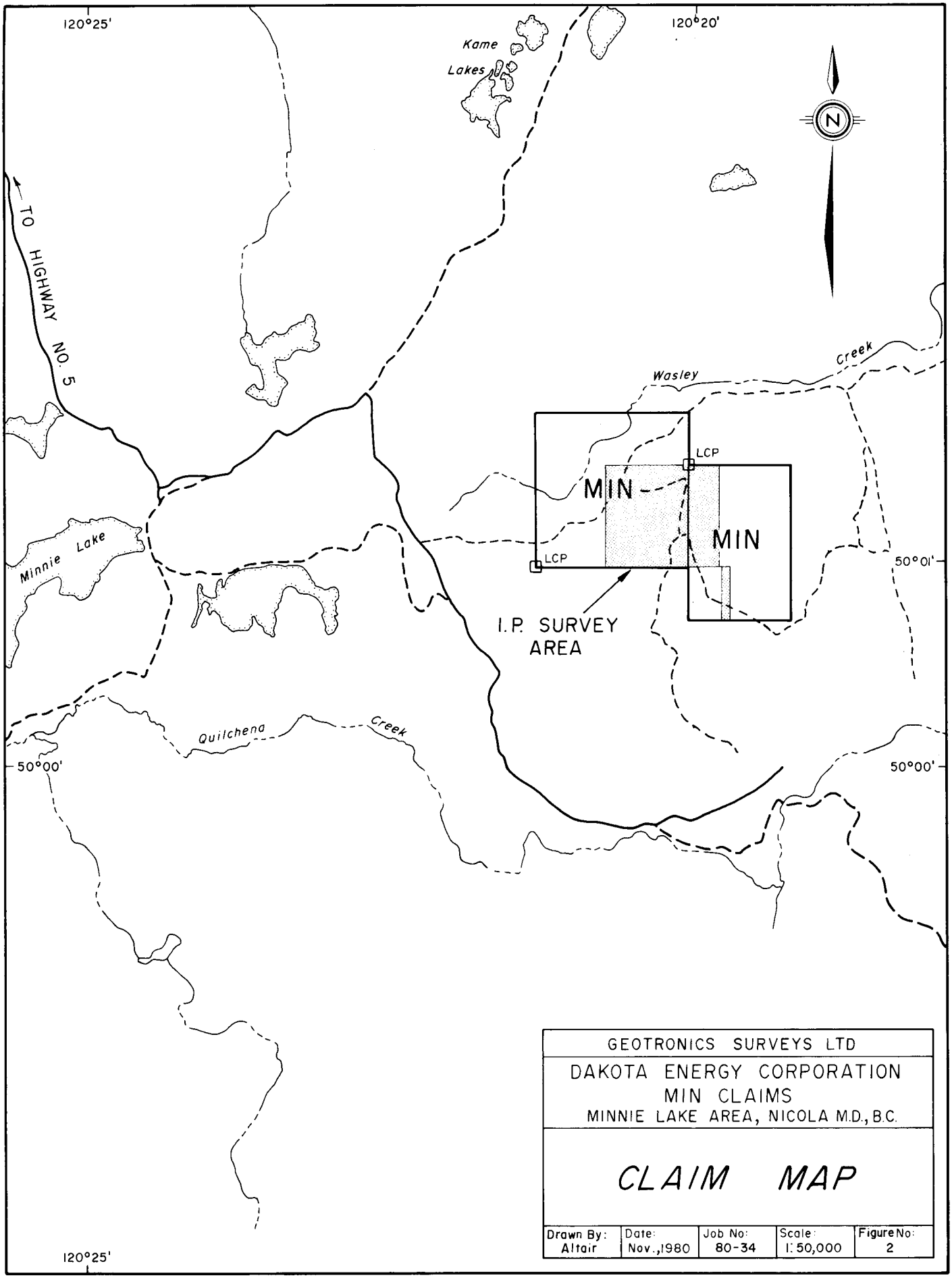
LOCATION MAP

SCALE

Km. 100 50 0 100 200 300 400 Km.

Miles 100 50 0 100 200 Miles

ALTAIR drafting services ltd.



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DAKOTA ENERGY CORPORATION
MIN CLAIMS
MINNIE LAKE AREA, NICOLA M.D., B.C.

CLAIM MAP

Drawn By:	Date:	Job No:	Scale:	Figure No:
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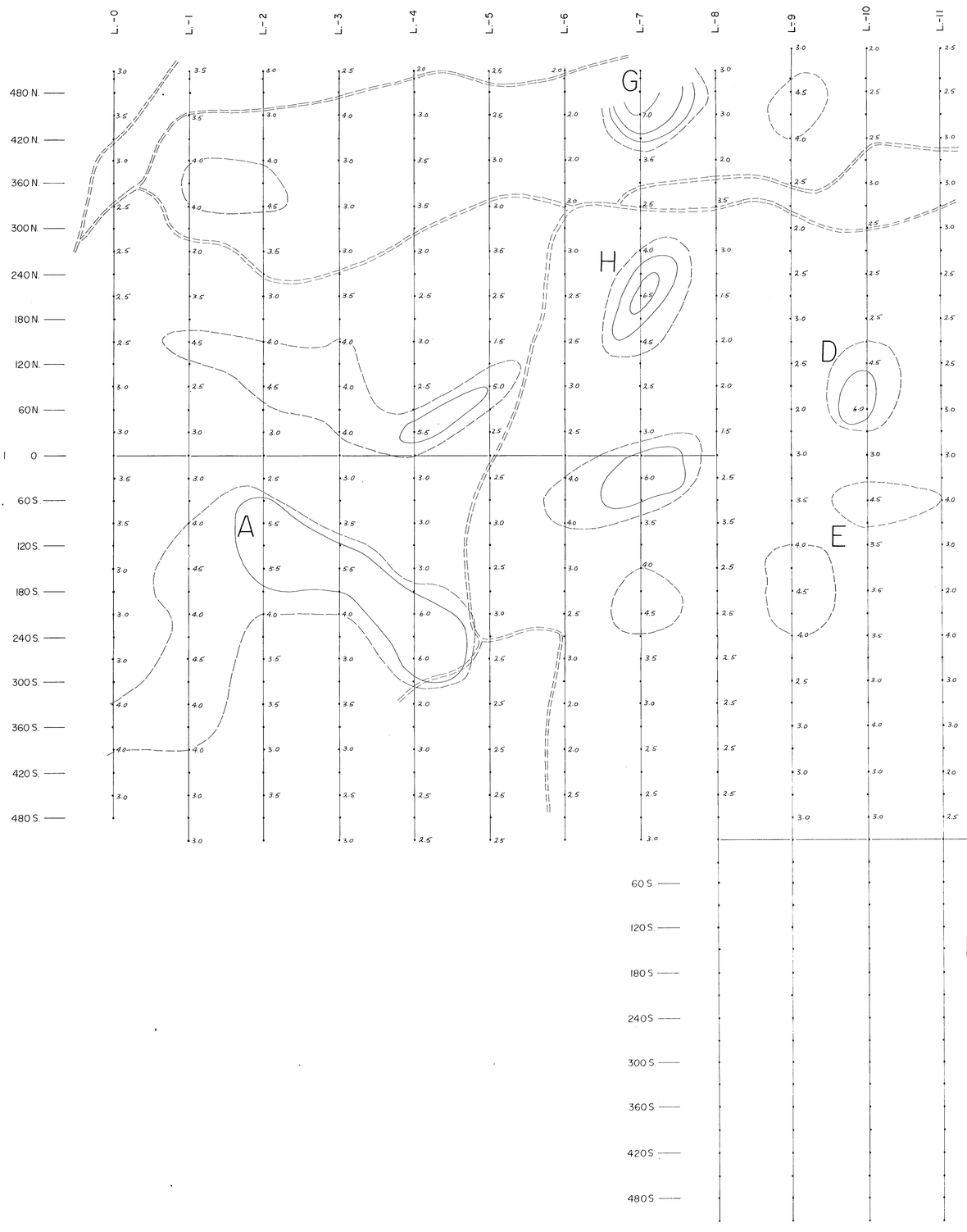

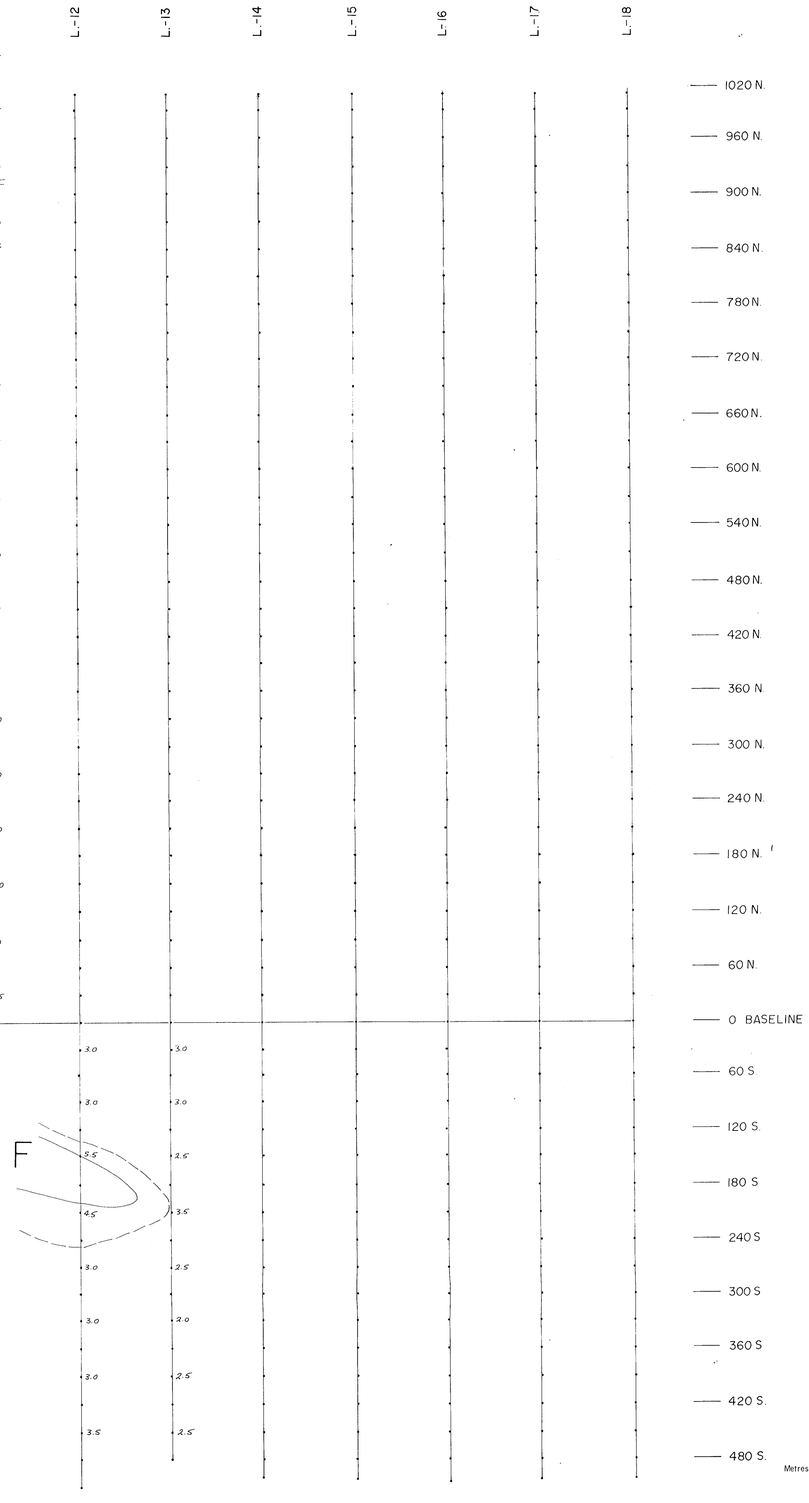

Metres 60 0 60 120 180 240 Metres

To Accompany Geophysical Report By David G. Mark, Geophysicist.

INSTRUMENTATION- FREQUENCY DOMAIN

ARRAY DIPOLE - DIPOLE

DIPOLE LENGTH 60 METRES

DIPOLE SEPARATION n=1,2,3

FREQUENCY 0.3 Hz., 10 Hz.

FREQUENCY EFFECT (% F.E.)

CONTOUR INTERVAL 1.0 %

- - - - - - 4.0% (POSSIBLY ANOMALOUS)

——— 5.0 % AND ABOVE (ANOMALOUS)

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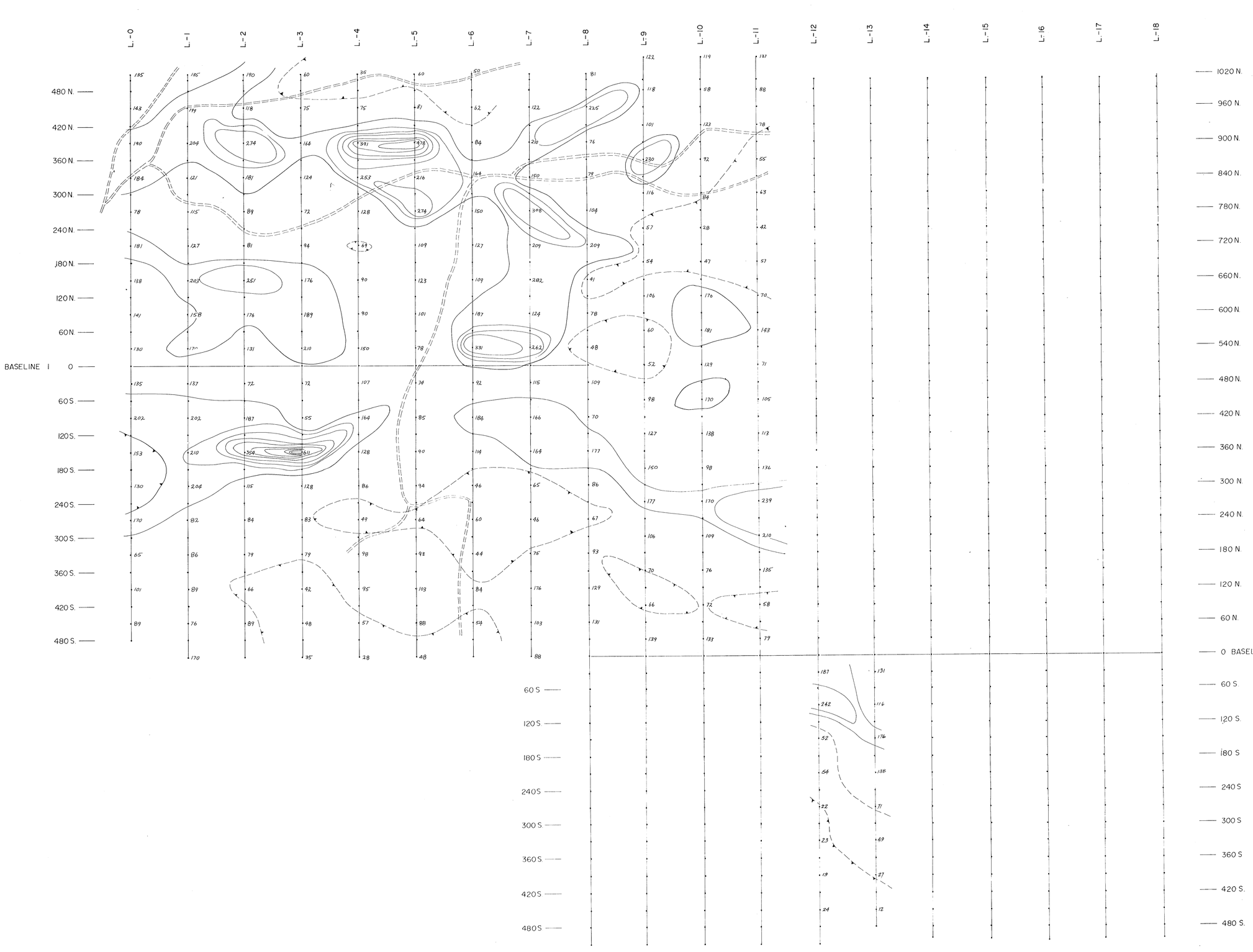
DAKOTA ENERGY CORPORATION
MIN CLAIMS
MINNIE LAKE AREA, NICOLA M.D., B.C.

INDUCED POLARIZATION SURVEY
FREQUENCY EFFECT
DATA & CONTOURS

SURVEYED BY:	DATE:	JOB No.	SCALE:	SHEET No.
G.A.P.	NOVEMBER, 1980	80 - 34	1 : 3000	3



RESISTIVITY

CONTOUR INTERVAL 45 OHM-METRES

---- 70 OHM-METRES

———— 160 OHM-METRES

INSTRUMENTATION- FREQUENCY DOMAIN

ARRAY DIPOLE - DIPOLE

DIPOLE LENGTH 60 METRES

DIPOLE SEPARATION n=1,2,3

FREQUENCY 0.3 Hz., 10 Hz.

Metres 60 0 60 120 180 240 Metres

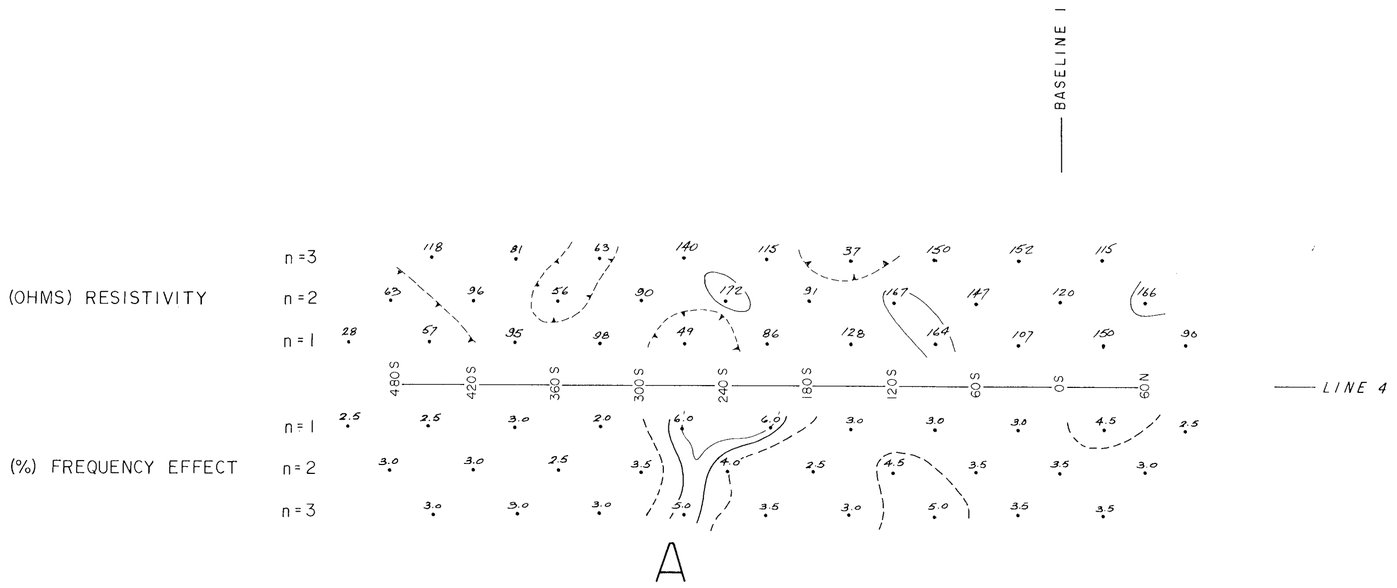
To Accompany Geophysical Report By David G. Mark, Geophysicist.

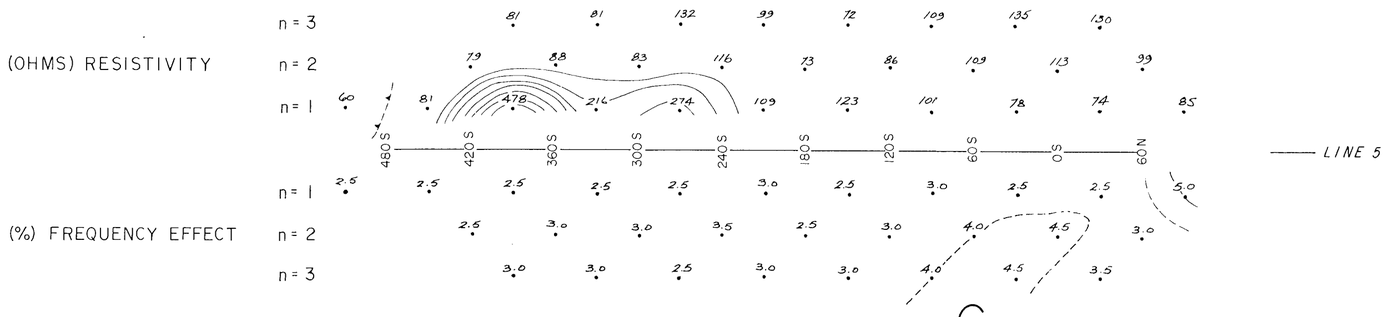
GEOTRONICS SURVEYS LTD.

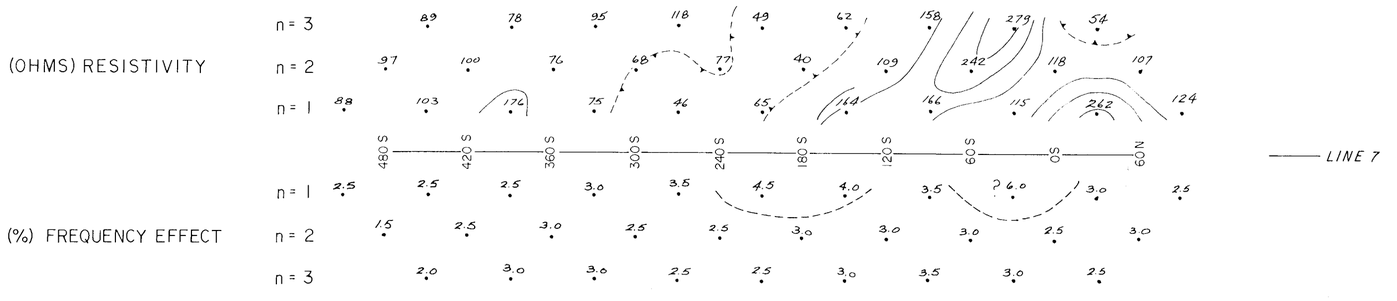
DAKOTA ENERGY CORPORATION
MIN CLAIMS
MINNIE LAKE AREA, NICOLA M.D., B.C.

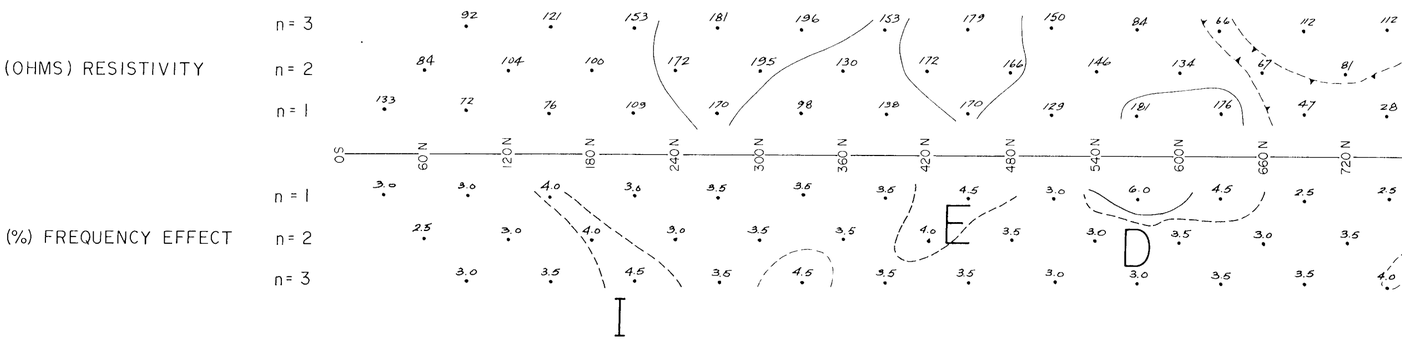
INDUCED POLARIZATION SURVEY
RESISTIVITY
DATA & CONTOURS

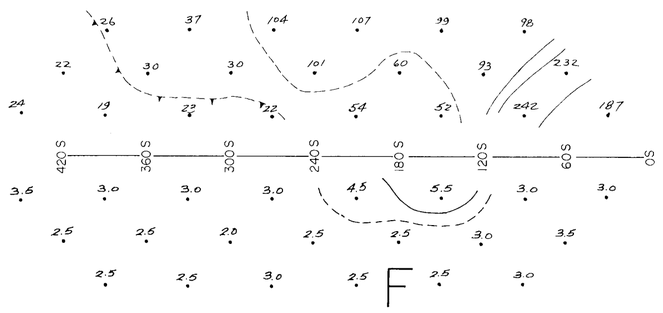
SURVEYED BY:	DATE:	JOB No.	SCALE:	SHEET No.
G.A.P.	NOVEMBER, 1980	80-34	1:3000	4











n = 3

n = 2 RESISTIVITY (OHMS)

n = 1

LINE 12

n = 1

n = 2 FREQUENCY EFFECT (%)

n = 3

BASELINE 2

LEGEND

RESISTIVITY

CONTOUR INTERVAL 45 OHM-METRES

70 OHM-METRES

160 OHM-METRES

INSTRUMENTATION – FREQUENCY DOMAIN

ARRAY DIPOLE - DIPOLE

DIPOLE LENGTH 60 METRES

DIPOLE SEPARATION n=1, 2, 3

FREQUENCY 0.3 Hz., 10 Hz.

FREQUENCY EFFECT (% F.E.)

CONTOUR INTERVAL 1.0 %

4.0% (POSSIBLY ANOMALOUS)

5.0 % AND ABOVE (ANOMALOUS)

Metres 60 0 60 120 180 240 Metres

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GEOTRONICS SURVEYS LTD.

DAKOTA ENERGY CORPORATION
MIN CLAIMS
MINNIE LAKE AREA, NICOLA M.D., B.C.

INDUCED POLARIZATION SURVEY PSEUDO SECTIONS
DATA & CONTOURS

SURVEYED BY:	DATE:	JOB No.	SCALE:	SHEET No.
G.A.P.	NOVEMBER, 1980	80 – 34	1: 3000	5