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A GEOPHYSICAL REPORT ON AN INDUCED POLARIZATION SURVEY WET, EAGLE AND HOPE CLAIMS GROUPS GRAND FORKS, B.C. (49°, 118°, S.W.)

- for -

THE GRANBY MINING COMPANY LIMITED

May 17 to August 22, 1970

- by -

82E/2E

A. R. Dodds, B.Sc., P.Geoph.
J. B. Prendergast, M.A., P.Eng.

REPORT ON

AN INDUCED POLARIZATION SURVEY

OVER

WET, EAGLE AND HOPE CLAIMS GROUPS

FOR

THE GRANBY MINING COMPANY LIMITED

BY

KENTING EARTH SCIENCES

CALGARY, ALBERTA

SEPTEMBER 1970

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INTRODUCTION

This report describes an Induced Polarization Survey carried out by Kenting Earth Sciences for The Granby Mining Company Limited over the Wet, Eagle and Hope claim groups, located near Grand Forks, British Columbia. The claim groups are contiguous and straddle Highway No. 3 approximately seven (7) miles by road west of Grand Forks. Their relative positions are shown on the location map.

Access to the claims is possible by foot directly from Highway No. 3, but steep slopes on either side of the highway preclude vehicle access by this route. The Wet and Eagle claim groups are reached by bush roads running north from Grand Forks. Access to the Hope Group is possible by an unpaved road turning west from Highway No. 3 approximately two (2) miles south of the claims.

The reconnaissance survey comprised concurrent readings of chargeability and resistivity taken at 200 foot intervals on pre-cut survey lines spaced 400 feet apart. The survey lines were oriented approximately north over the Wet and Hope claims, and approximately east over the Eagle claims. Detailing comprised coverage of selected lines with additional electrode separations and, in some cases, surveying of fill-in lines at 200 foot intervals or lines perpendicular to the reconnaissance grid.

The field work was done at various times between May 17th and August 22nd, 1970, the actual periods of work on each grid being listed in the Appendix to this report. The Party Chief was D. Ragan, supervised from Calgary by A. R. Dodds. Supervisory visits were made at regular intervals to ensure optimum survey results, at which times decisions

regarding the survey specifications were made in consultation with Mr. J. Paxton of The Granby Mining Company Limited.

The purpose of the survey was to prospect for economic sulphide mineralization similar to that being mined at Phoenix, approximately five (5) miles to the north west. The effectiveness of the I.P. method for this purpose was demonstrated in test profiles run over the mine workings in 1967, which clearly showed the ore zones as chargeability highs.

The reconnaissance data are presented in the form of contoured plan maps of apparent chargeability and apparent resistivity at a scale of 1 inch to 200 feet (Drawings 1227B-1 & 2 and 1227C-1 & 2). Data for lines detailed with more than one electrode separation are shown as profiles at the same horizontal scale (Drawings 1227B-4 to 8, 1227C-4 & 5). Maps showing the correlation between the survey grids and claim boundaries are also included (Drawings 1227B-3 and 1227C-3).

SURVEY SPECIFICATIONS

Equipment

The Induced Polarization equipment used for this survey operates in the time-domain and is manufactured by Huntec Limited in Toronto. The following specifications apply to the Mark II Unit, which was used for the majority of the work:

Type of Current	Direct Current, broken at periodic intervals.
Period	1.5 seconds "current on" and 1.0 seconds "current off". Alternate pulses have reverse polarity.
Delay Time	15 milliseconds
Integrating Time	400 milliseconds
Maximum Power Available	7.5 kilowatts
Maximum Current Available	8.0 amperes

Measurements taken in the field are:

1. The current flowing through the current electrodes C_1 and C_2.
2. The primary voltage Vp, between measuring electrodes during "current on" time.
3. The apparent chargeability, Ma, which is the secondary voltage between the measuring electrodes during the "current off" time referenced to Vp.

The specifications for the Mark I Unit, which was used for parts of this survey, differ from the above in that the "current off" time is shortened to 0.5 seconds and that the secondary voltage, Vs, is measured directly rather than as a ratio of Vp. Thus the apparent chargeability is calculated subsequently by dividing Vs by Vp and multiplying by 400, which

is the sampling time in milliseconds of the receiver unit. The Mark II Unit performs this operation internally and provides a direct readout of apparent chargeability.

The apparent resistivity is calculated by dividing Vp by the current and multiplying by the geometrical factor appropriate to the electrode array being used.

Electrode Configuration

The pole-dipole electrode array was used for this survey. In this array, one current electrode, C_1, and the two potential electrodes, P_1 and P_2, are moved in unison along the survey lines. The second current electrode, C_2, is placed sufficiently far from the moving electrodes that it does not affect the direction of current flow within the moving array. The electrode separation, "a", is defined as the distance between electrodes C_1 and P_1, and controls the depth penetration of the array. The length of the potential dipole must be less than or equal to "a", and is generally kept in a constant ratio, e.g. a/2 or a/4, for a survey area.

For this survey, the reconnaissance work was done using an "a" value of 400 feet, keeping the potential dipole at a/2. Detailing, to provide additional data for interpretation purposes, was done with "a" values of 100 feet and 200 feet.

GEOLOGY

The geology of the area is taken from information provided by The Granby Mining Company Limited. Only the general picture and any specific features considered pertinent to the geophysical interpretation will be discussed in this report.

The geological maps show complex areas of sediments, chiefly limestone and argillite, with diorite and monzonite intrusions; these are surrounded by extensive areas of andesite which have been interpreted as thin flows overlying the sediments. Most of the sulphide showings occur in the sediments and have been thoroughly investigated by pitting or trenching, with the conclusion that they are of small extent. The sulphide minerals present are pyrite, pyrrhotite and chalcopyrite, frequently with skarn minerals.

INTERPRETATION

Wet and Eagle Grids

Two (2) I.P. Receivers were used for this work. The initial part was done with the Huntec Mark I Receiver, covering the northeast corner of Wet Grid and the whole of the Eagle Grid. Extension of the lines to the south proved impossible with the Mark I Receiver because of high noise levels and very low resistivities. The Huntec Mark II Receiver was therefore tried and coped with the problem and was therefore used for the remainder of the Wet Grid. Comparative tests showed that while resistivity measurements were almost identical with the two receivers, the chargeability measurements, because of different instrument parameters, were approximately 50% higher when using the Mark II Receiver than when the Mark I Receiver was used. Areas covered with each of the receivers are clearly identified on the apparent chargeability contour map, Drawing No. 1227B-1.

The survey shows an extensive belt of high chargeability extending from the southeast corner of the grid to the northwest corner. There is no indication of any decrease in the strength of the anomalies at the edges of the survey grid, so the zone can be expected to extend beyond the grid limits. The zone is almost a half a mile wide at its narrowest point. Individual anomalies can be selected within this belt, some of which were detailed with other electrode separations and all of which are discussed in the following paragraphs. With the exception of the northwest corner, the whole of this belt also shows low to very low resistivities. To the east of Line 16E, the change from high to low resistivity occurs at approximately Station 5N and appears to mark the contact between andesite and limestone, the former being of higher resistivity. The northwest edge of the low resistivity area is some-

what indefinite and may mark the boundary between bedded and massive limestones, with the bedded limestones giving the low resistivity. The western boundary of the low resistivity area is again fairly clear and follows Lines 0 and 4W. Outcrop is apparently sparse in this area and it cannot be told whether the high resistivity zone is indicating andesite or massive limestone. However, on the strength of the known geology from the Hope Grid on the west side of the highway, and the low chargeabilities in the southwest corner of this grid, it is expected that the underlying rocks are andesite.

Generally, therefore, it is postulated that areas underlain by andesite show high resistivities and low chargeabilities. Areas underlain by sediments show high chargeabilities and, where these sediments are bedded limestone, low resistivities. In areas where high chargeabilities or low resistivities are recorded over andesite, it is suggested that the andesite is of limited thickness and is underlain at shallow depth by sediments.

Zone 1

This zone is located in an area of little outcrop, such information as is available indicating that the underlying rock is limestone. The zone is simple and has good strike length, extending from 7+00S on Line 36E to the southeast corner of the grid. Detailing was done on Line 44E and indicates a wide horizontal source as shown beneath the detail profile. The depth to the top of this source is expected to be not more than 50 feet, and the thickness of the order of 100 feet. The source appears to taper at the north end, although the depth to the upper surface remains much the same. The true chargeability of the source must be at least 40 milliseconds above background, and probably considerably higher, indicating a sulphide content, if sulphides are the cause, of at least 3% by volume. The other

likely source material in this environment is graphite, this possibility being supported by the apparent bedded nature of the anomalous body. A vertical drill-hole (DDH 1) is suggested for testing this anomaly, collared between 13+00S and 15+00S on Line 44E and drilled to a depth of 200 feet. Since there is no geophysical indication of any variation in the source material over the extent of the anomaly, discouraging results from this hole should eliminate the anomaly from further investigations, so long as a source for the higher chargeabilities is located.

Zone 2

This zone comprises a single point anomaly on Line 44E which is possibly linked to the northern end of Zone 1. The detail results do not give a clear picture, but again seem to indicate a flat lying source at shallow depth. No further work is recommended at this time because of the limited extent and poor definition of the anomaly and the probability of the same source material as for Zone 1.

Zone 3

This extensive and irregular zone, outlined by the 30 millisecond contour, doubtless includes a number of anomalies that cannot readily be separated in the reconnaissance data. It is close to the western edge of the area of low resistivities and extends over the southern edge of the survey area. The bedrock is expected to be limestone, under a thin overburden cover. Detailing was done on Line 12E and identifies five anomalies within the zone, the locations of the interpreted sources being shown under the detail profiles.

The southernmost source comes close to surface at about 29+00S and appears to

dip gently northwards. The most likely solution appears to be a tabular body striking north east and extending from Line 16E into the unsurveyed area south of the grid limits. This body would dip gently to the northwest for a horizontal distance of at least 600 feet. However, much the same apparent dip effect would be produced by a vertical source angling laterally away from the survey line, so that the above solution, although most probable, is not unique. For this reason it is recommended that this anomaly be tested at the southern end, where its location is most accurately known. If there are no indications of the source of this anomaly at surface in the area of 29+00S to 30+00S on Line 12E, trenching might be considered at this location. However there is no guarantee, from the geophysics, that the source is shallow enough or at bedrock surface; in fact the resistivity profiles show rather higher resistivities in the near surface layers, possibly indicating a thin capping of andesite. In this case drilling is suggested, and a hole (DDH 2) collared at approximately 28+00S on Line 12E and plunging 60° south should intersect the target within 200 feet.

The second anomaly identified under the detail profile lies between 13+50S and 16+50S and appears to be very shallow, probably within 50 feet of surface, quite concentrated but with little depth extent. It is uncertain whether this is a single source centred on 15+00S or whether two sources, centred on 14+00S and 16+00S, are involved. The strike direction and extent of this anomaly are uncertain because of the complexity of the zone and because the anomaly only shows up strongly on the narrower detail electrode separations. Further investigation of this anomaly should be restricted, at this time, to surface examination of the immediate area, and possibly trenching, for geological indications. If this should prove unsuccessful, a drill-hole (DDH 3), collared at 15+00S on Line 12E and plunging 60°

north for a hole length of 250 feet, should intersect the source.

The third anomaly extends from 8+50S to 11+50S on Line 12E and has the characteristics of a horizontal slab. The depth to top is expected to be less than 100 feet and the thickness about 50 feet. As for the last anomaly, and for the same reasons, the strike direction and length of this anomaly are uncertain. A vertical drill-hole (DDH 4), collared at 10+00S and drilled to a depth of 150 feet should determine the cause of the anomaly.

The anomaly at 5+50S is considerably deeper than any other in this zone, showing most strongly on the 200 and 400 foot electrode separations. Thus, although the apparent chargeabilities are weaker than some others in this zone, the greater depth of burial would indicate equally high true chargeabilities within the source. It seems probable that this source extends from 4+00S on Line 4E to 6+00S on Line 20E and possibly further towards Zone 1. The source is slightly more conductive than surrounding rocks which, together with the high chargeabilities, may indicate a high concentration of sulphides or graphite. The target for this anomaly is 300 feet below 5+75S on Line 12E, a 60° hole (DDH 5A or 5B) being recommended. It should be pointed out that, although this anomaly appears to be continuous through this line, it is possible that the source is in fact to one side of the line, probably east, and not directly under the survey line. The optimum target would be under Line 16E, but lack of detailing here precludes the definition of a location. Additional I.P. detailing might be warranted if further investigations indicate this general area to be favorable geologically.

A fifth anomaly at shallow depth is picked up at the northern extremity of this

detail line. However the anomaly is relatively weak and of small extent, and was not fully detailed, so no analysis can be given. Further work should depend on the development of the geological picture from drilling more clearly defined I.P. targets.

Zone 4

Assuming that the geology, taken from a 1 inch to 1,000 feet map, is accurate, this zone is underlain primarily by limestone, with a diorite dyke cutting across the northern edge. There are at least two pyrite showings in the immediate vicinity. Resistivities in the area are intermediate so that, by the earlier deductions, the limestone here may be transitional between bedded and massive.

The zone was not detailed because outcrop is widespread and the area has therefore been thoroughly investigated on surface. Also, there are no encouraging showings of economic mineralization in the immediate area nor is there a concealing cover of andesite. This, of course, does not rule out the possibility of non-outcropping economic sulphides, and the anomalies cannot be totally discounted. The strongest part of this zone in part coincides with a pyrite showing, giving an obvious and most probable source. Further investigation might be warranted along the anomaly to the northwest, if there is any probability of a change in the sulphide minerals present. Detailing, with a fill-in line at 2W, would be required to give drilling targets.

Zone 5

This zone was selected for detailing because of the presence of economic sulphide outcrops nearby and because most of the zone is underlain by andesite, which shields the more favorable sedimentary rocks. Although the original anomaly was fairly simple, the

detailing, including three fill-in lines, complicated the picture considerably. It is evident that this is not a simple source, but a series of narrow bands, and in spite of fairly heavy detailing, it is somewhat speculative to trace these sources from line to line. Some assumption is necessary, and it has been assumed that a northwest strike is most probable.

Detailing on Line 14W shows that the sources are shallow, only the 100 foot electrode separation showing the individual sources rather than integrating them into a general anomaly. Both of the more southerly sources are expected to be very narrow and shallow, that at 8+00N coinciding with outcropping sulphide mineralization. The source at 5+70N may be under andesite. The anomaly at 10+50N indicates a rather deeper source, but still within 200 feet of surface.

The anomalies over Line 18W indicate deeper sources, as would be expected with the andesite cover, and discrimination of individual anomalies is poor. The source at approximately 11+00N is fairly well defined, but that at 5+50N is not definite, since the expression in the 400 foot electrode spacing results is weak and the 200 foot separation does not pick up this source. It is possible that the northerly source links up with the source at 10+50N on Line 14W.

Line 22W shows one anomaly, but detailing is not comprehensive. The source is therefore not accurately located laterally or as regards depth. However the location as shown should not be more than 100 feet in error and a minimum depth of burial of 200 feet is expected. Linking this anomaly to the tentative source at 5+50N on Line 18W gives a strike which, when extended to the east, would cross the showing on Line 14W. This continuity is therefore reasonable and would indicate a possible extension of this economic mineralization.

The doubtful continuity and poor definition of these anomalies decreases the likelihood of drill-holes intersecting the sources. It is therefore recommended that every effort be made to resolve the complex geology in this area, primarily by tying in the known geology to the survey lines, before recoursing to drilling. Failing any clarification after this has been done, the following drill-holes are suggested:

DDH 6 - collared at 7+60N on Line 14W and drilled 60° south for a hole length of 250 feet.

DDH 7 - collared at 11+30N on Line 14W and drilled at 60° south for a hole length of 300 feet.

DDH 8 - drilled at 60° north or south to intersect a point 400 feet below Station 5+75N on Line 18W.

Hope Claim Group

The resistivity survey of this area shows an extensive strong low associated with an area mapped as limestone, similar to one encountered on the Wet Claim Group. However the boundaries do not coincide with geology of the east flank, where the low resistivity extends into andesite, or in the southwest corner, where higher resistivities are encountered over limestone. Assuming the geological map to be accurate, and that all the limestones and only the limestones have lower resistivities in this area, then the surface rocks in these two areas must be thin. In the southeast corner of the grid, the andesite would be underlain at shallow depths by limestone, while in the southwest corner, the limestone would be underlain by high resistivity rocks such as intrusives. The area of limestone extending from near surface to over 400 feet depth would, under this assumption, be roughly outlined by the 1,000 ohm-meter contour. Alternatively, there may be low resistivity rocks other than limestone in the southeast corner, possibly fractured andesite, and high resistivity limestone, possibly more

massive as in the case of the Wet Grid, in the southwest corner.

In the centre of this limestone belt is a north striking zone of very low resistivity, so low that readings were difficult or impossible to obtain when further complicated by high noise level near the power line. The cause of this extremely low resistivity does not appear to be metallic because of the lack of comparable chargeabilities, although the strength of the low would indicate this. Barring such artificial causes as water pipes, the source could be saline water in a highly fractured zone or some form of current channeling. A Wenner array resistivity survey would map this zone more effectively and might assist in defining the cause.

The area is characterized by high chargeabilities throughout, with all rock types. As is normal in this situation, the chargeability variations are considerable, so that selection of interesting features for further investigation has to be somewhat arbitrary and may well ignore some areas that do not show flat chargeabilities, and could warrant additional work if supported by favorable indications with other techniques. The four zones selected for discussion are thoseshowing linear continuity rather than great areal extent, since the latter can be caused by very minor changes in subsurface.

Zone 1

This zone comprises three circular anomalies on Line 28E, following the eastern edge of the low resistivity area. The northern peak is underlain by andesite, the southern peak by limestone and the centre peak is located close to the contact between these rock-types. As mentioned earlier, it is suspected that the andesite here is underlain by limestone at fairly shallow depth, so that all three sources may well be located within the limestone.

Moreover it is quite possible that the anomalies in fact come from a continuous source striking roughly north, the peak chargeabilities occurring where the source comes closest to the survey line.

Because of the last named possibility, detailing was done on two cross-lines at 22+00S and 32+00S. This detailing, with narrow electrode spacings, reveals the true complexity of the sources. Three sources are shown under Line 22S, all being narrow and near surface. The westerly source, at 6+00E (about 25+30E on the original grid), is associated with a resistivity low and therefore may contain massive sulphides or graphite, whereas the source at 9+00E (the intersection with Line 28E) has no resistivity contrast associated. Both of the sources may be very narrow, possibly as little as 20 feet. The third source (at 12+00E) appears to be wider and has been placed in limestone underlying the andesite, although there is nothing in the detail work to indicate the source topping off at this depth. This profile also shows a sharp drop in chargeability and increase in resistivity at about 13+50E (32+50E on the original grid) and would be interpreted as the contact between andesite and limestone except for geological mapping evidence. It is therefore suggested that the surface andesite west of this point is thin, say 20 feet thick, and at this point either the contact becomes near vertical or there is a change in rock-type under the andesite capping.

Detail Line 32S covers the southern peak in Zone 1, and indicates two sources; a narrow one at 5+00E and a wider one between 8+00E and 10+00E, the latter coinciding with the intersection between this line and Line 28+00E. Neither source shows any resistivity contrast, but resistivities over this section are, in any case, quite low. Neither source shows up on the wider (200 feet) electrode separation, which may be accounted for by the westerly

source being very narrow and the easterly source having little depth extent. A third source may be showing up at the east end of this line, between 12+00E and 14+00E, indicated by both increasing chargeabilities and lower resistivities, but detailing did not extend far enough to cover them because of very rough terrain. The west end of the detail line also shows the extremely low resistivities in the region of Line 20E, with a strong non-chargeable conductor between 2+00E and 3+00E on the detail line.

The following drill-holes are recommended to test the anomalies:

DDH 8 - collared at 6+30E on Line 22S and drilled at 60° west to a hole length of 200 feet.

DDH 9 - collared at 9+50E on Line 22S and drilled at 60° west to a hole length of 200 feet.

DDH10 - collared at 9+00E on Line 32S and drilled vertically to a hole length of 150 feet.

Favorable results would indicate the desirability of detailing the northern anomaly, at 10+00S on Lines 24E and 28E.

Zone 2

This zone is located in the southwest corner of the grid, where higher resistivities were obtained over limestone surface rocks. No detailing was done because of the proximity of the zone to claim boundaries. The source is expected to be wide, of the order of 200 feet across, and could be either homogeneous or a series of mineralized bands. The resolution of this last alternative and an estimation of depth of burial would require detailing with narrower electrode separations, preferably done on Lines 8E and 12E between 24+00S and 40+00S. The sources should, however, be located under the peak chargeabilities.

Zone 3

This zone is located in the area of high resistivities and is underlain primarily by argillite. The strongest part of the anomaly occurs on Line 8E with weaker expressions on Line 12E and a possible, but tentative, extension through to the weak high on Line 24E. The double peak on Line 8E could be caused by a shallow source in the vicinity of 8+00S or two deeper sources under the peaks, the latter possibility being more probable since two sources are definitely indicated by readings on Line 12E. A depth of burial of the order of 300 feet is therefore suggested, but should be checked prior to drilling by detail work with closer electrode separations on Line 8E.

Zone 4

The rock type here is shown as argillite. The anomaly is open to the west, outside the grid, and has a strike length of at least 800 feet. The source is expected to be either wide or fairly deeply buried, detailing being required to resolve these possibilities. High resistivities in the area would indicate a disseminated source which, if wide, would require only minor sulphides to produce this strength of anomaly. The anomaly is sufficiently strong and extensive to warrant detail work unless there are other indications to the contrary, such as an obvious known source.

SUMMARY

The Induced Polarization Survey over the Wet, Eagle and Hope Claim Groups shows areas of relatively low chargeability and high resistivity associated with andesites. Areas mapped as sediment generally show higher chargeabilities and in some places, low to very low resistivities. The latter occur in the southeast quarter of the Wet Claim Group and the southern part of the Hope Claim Group over areas mapped as limestone, and are interpreted as being caused by bedded rather than massive limestone. Some areas near the edge of the andesites show lower resistivities or higher chargeabilities and it is interpreted that in these areas the thickness of the andesite is small and that the source of lower resistivities or higher chargeabilities comes from beneath the andesite.

The extensive areas of chargeabilities in the 20 millisecond range are regarded as background for these rock types and could be caused by very minor amounts of sulphides, graphite or magnetite. Five anomalies on the Wet Claim Group and four on the Hope Claim Group have been selected as being possibly caused by more concentrated zones of these minerals.

Wet Claim Group

Zones 1, 2 and 3 occur in an area of little outcrop and therefore little known geology. It is considered important to discover the reason for the generally high chargeabilities and low resistivities in this area, and five drill-holes have therefore been recommended to test Zones 1 and 3. Zone 2 is considered too small in extent to warrant further investigation before the geological picture has been clarified.

Zone 4 occurs in sediments and is probably caused by pyrite, which is present in outcrops nearby. This can be confirmed by checking surface geology. No further work is suggested.

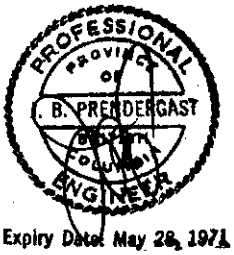
Zone 5 is complex and partly associated with sulphide outcrops, some containing economic mineralization. A more precise correlation between the geology and the survey lines has been recommended, and three drill-holes have been tentatively spotted.

Hope Claim Group

Only one (Zone 1) of the four anomalous zones in this area was detailed. A complex north-striking source has been interpreted for this zone, and three drill-holes recommended. Further detailing is required on the other three zones, and on the northern part of Zone 1, before drilling targets could be recommended. All three zones, with the possible exception of Zone 3, are sufficiently strong and extensive to warrant this additional work, on geophysical grounds.

Respectfully submitted,

KENTING EARTH SCIENCES
Western Division



Expiry Date: May 28, 1971

8/15/70

A. R. Dodds, B.Sc., P.Geoph.
Chief Geophysicist.

J. B. Prendergast, M.A., P.Eng.
Division Manager.

APPENDIX

CLAIMS SURVEYED

The following mineral claims were covered, in whole or in part, by this survey:

Wet and Eagle Grids

Alpha	L3174
Buller	L3242
Connection	L954
Crescent	L3383
Denver	L2169
Eagle	L577
Homestake Fr.	L3167
Hesperus	L3057
Myrtle	L3019
The Layover	L434
Wet	1-29 Inc.

Hope Grid

Hope 1-6, 8,
400, 500, 700, 800 FR's.

MILES SURVEYED

The following list gives the number of readings taken and miles of line covered with each electrode spacing:-

Electrode Separation	Station Interval	Miles Surveyed	Readings
100'	100'	1.74	95
200'	100'	1.85	104
400'	200'	28.46	802
	Total	32.05	1,001

TIMING

The field work on each claim group was done during the following periods:-

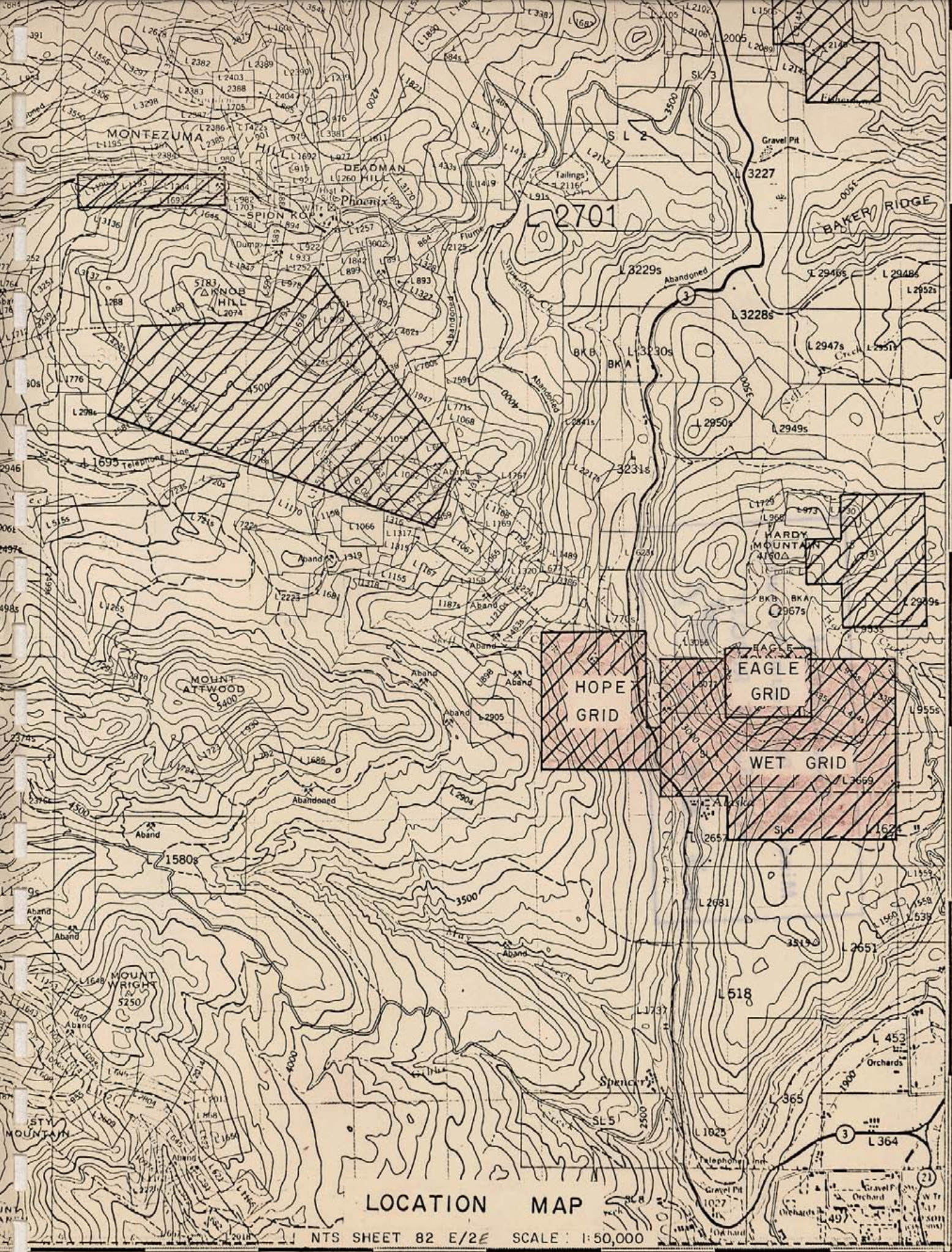
Eagle Claim Group	- May 17-23, 1970	7 Survey Days
Wet Claim Group	- May 24-30, 1970) - June 12-30, 1970) - Aug. 13-19, 1970)	31 Survey Days
Hope Claim Group	- July 1-9, 1970) Aug. 20-22, 1970)	12 Survey Days

APPRENDIX (cont'd)

PERSONNEL

The following personnel were involved in the survey:-

Name	Position	Period	Rate/Day	Total Cost
D. Ragan	Party Chief	May 17-Aug. 22/70	$80.00	$4,000.00
J. Wilson	Operator	May 17-July 9/70	$66.00	2,640.00
G. Teske	Operator	June 14-Aug. 22/70	$66.00	1,620.00
M. Hicke	Helper	May 17-20/70	$40.00	160.00
B. Regan	Helper	May 22-June 15/70	$40.00	480.00
B. Ragan	Helper	Aug. 13-22/70	$30.00	300.00
G. Simard	Helper	Aug. 13-22/70	$40.00	400.00
A.R.Dodds	Geophysicist	Aug. 4, 5/70) Sept. 12-25/70)	$135.00	1,495.00
M. Cole	Draftsman	Sept. 14-Oct. 6/70	$75.00	1,250.00
G. McVeigh	Typist	Sept. 30/70	$25.00	25.00
I.P. Unit		May 17-Aug. 22/70	$58.00	2,860.00
4x4 Vehicle		ditto	$20.00	1,000.00
Board & Lodging, etc.				1,831.64
			TOTAL	$18,061.64


MONTEZUMA HILL
DEADMAN HILL
SPION KOP
KNOB HILL
5183
BAKER RIDGE
HARDY MOUNTAIN
4760
MOUNT ATTWOOD
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MOUNT WRIGHT
5250
HOPE GRID
EAGLE GRID
WET GRID
Gravel Pit
Tailings
Dump
Flume
Abandoned
Telephone Line
Orchards
Spencer
Telephone Inn
L 2701
L 3227
L 3228s
L 3229s
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L 3231s
L 2950s
L 2949s
L 2947s
L 2948s
L 2946s
L 2952s
L 1695
L 1580s
L 2904
L 2905
L 2681
L 2657
L 2651
L 518
L 453
L 365
L 364
L 1025
L 1027
SL 1
SL 2
SL 3
SL 5
SL 6
SL 8
BKA
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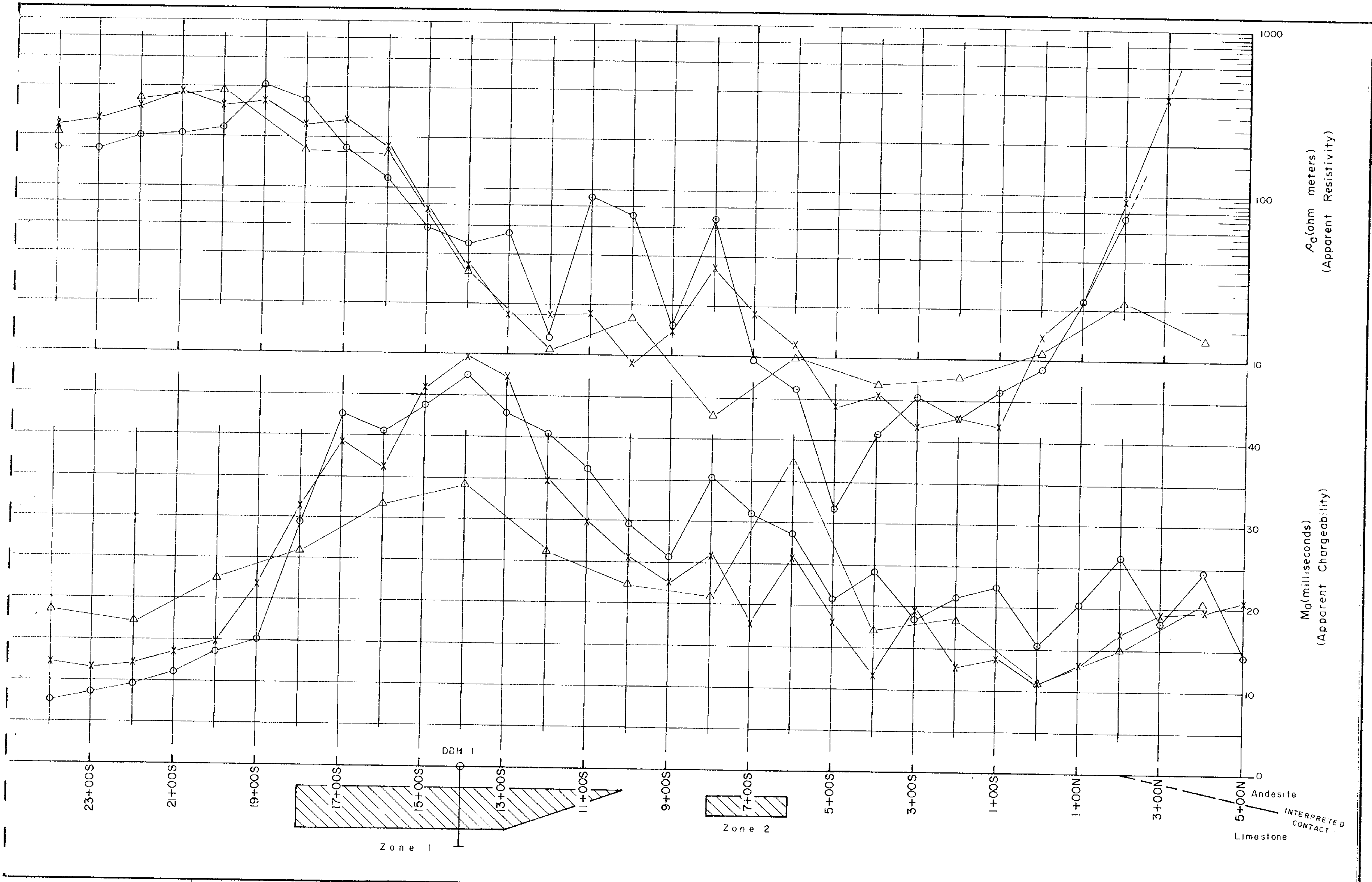
Abandoned
Alaska
LOCATION MAP
NTS SHEET 82 E/2E SCALE : 1:50,000
41
40
39
38
37
36
35
34
33
32
31
30
49°00'
118°30'
81
82
83
84
85
86
87
88
90
389000m.E.



INDUCED POLARIZATION SURVEY

DETAIL PROFILE: LINE - 44 E

THE GRANBY MINING COMPANY LIMITED

WET CLAIM GROUP, GRAND FORKS, B.C.

LEGEND

INTERPRETED CAUSATIVE BODY

RECOMMENDED D.D. HOLE

a = 50'

a = 100'

a = 200'

a = 400'

POLE - DIPOLE ARRAY

C_2 P_2 P_1 Sta. Loc. C_1

∞ $\frac{a}{2}$ $\frac{a}{2}$ $\frac{a}{2}$

Horizontal Scale: 1 inch : 200 feet.

Vertical Scales:

Chargeability — 1 inch: 10 milliseconds

Resistivity — 2 inches: 1 logarithmic cycle (ohm-meters)

INSTRUMENT PARAMETERS

ON	1.5 secs.
OFF	1.0 secs.
DELAY	0.015 secs.
INTEGRATE	0.4 secs

PROFESSIONAL ENGINEER PROVINCE OF B. PRENDERGAST

Expiry Date: May 28, 1971

To accompany report by:

Andrew R. Dodds

Andrew R. Dodds, B.Sc. P. Geoph.

Geophysicist

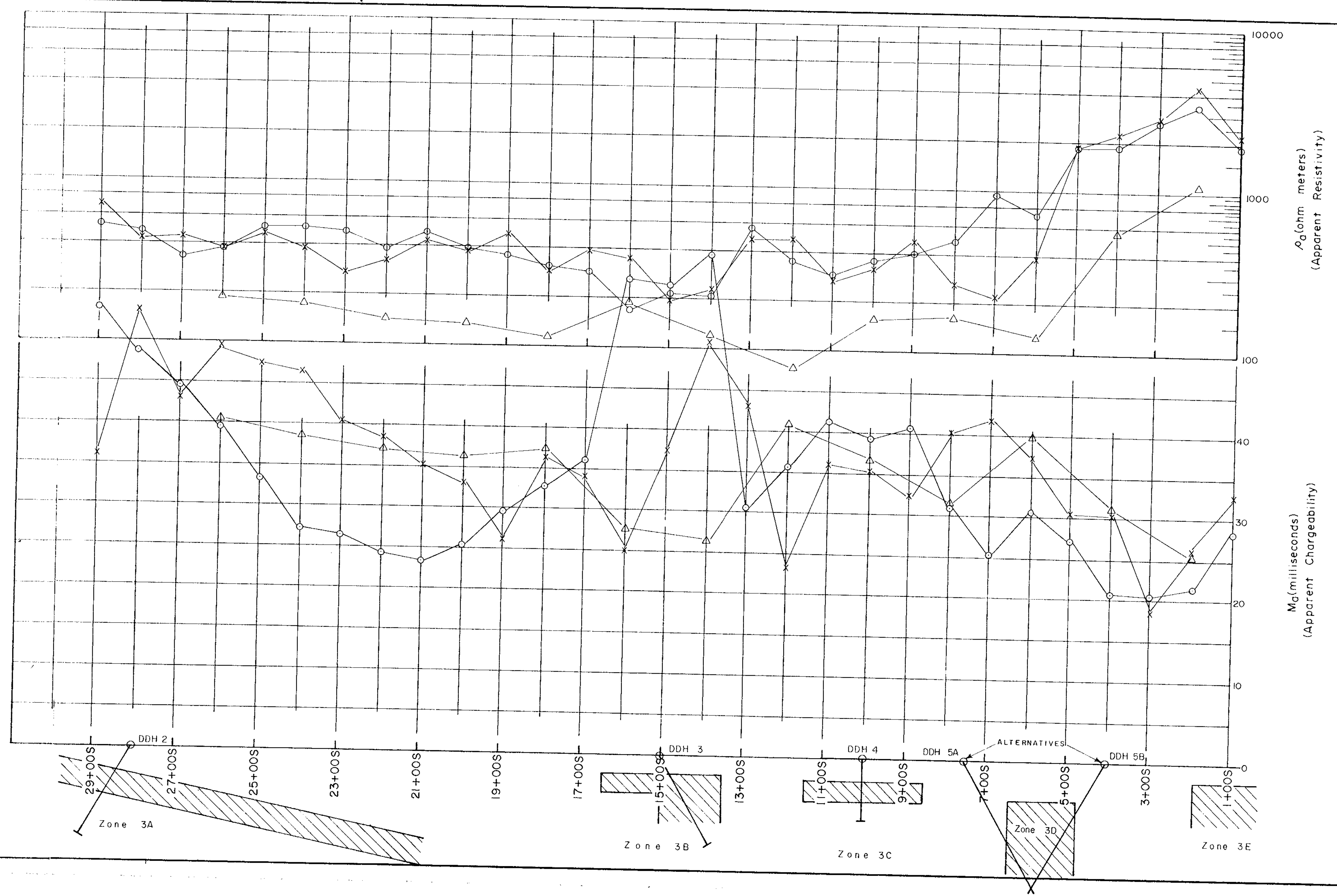
KENTING EXPLORATION SERVICES LIMITED

Earth Sciences Division

CALGARY CANADA

JOB No. PC 1227

DWG No. 1227B/4



INDUCED POLARIZATION SURVEY

DETAIL PROFILE: LINE - 12 E

THE GRANBY MINING COMPANY LIMITED

WET CLAIM GROUP, GRAND FORKS, B.C.

LEGEND

INTERPRETED CAUSATIVE BODY

RECOMMENDED D.D.HOLE

a = 50'
a = 100'
a = 200'
a = 400'

POLE - DIPOLE ARRAY

C2 — ∞ — P2 — a/2 — P1 — a/2 — Sta. Loc. — a/2 — C1

Horizontal Scale: 1 inch : 200 feet.

Vertical Scales:

Chargeability — 1 inch : 10 milliseconds

Resistivity — 2 inches : 1 logarithmic cycle (ohm-meters)

INSTRUMENT PARAMETERS

ON	1.5 secs.
OFF	1.0 secs.
DELAY	0.015 secs.
INTEGRATE	0.4 secs.

To accompany report by:

Andrew R. Dodds B.Sc. P.Geoph.

Geophysicist

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — J. B. P...ERGAST

Expiry Date: May 28, 197?

80/5/70

KENTING

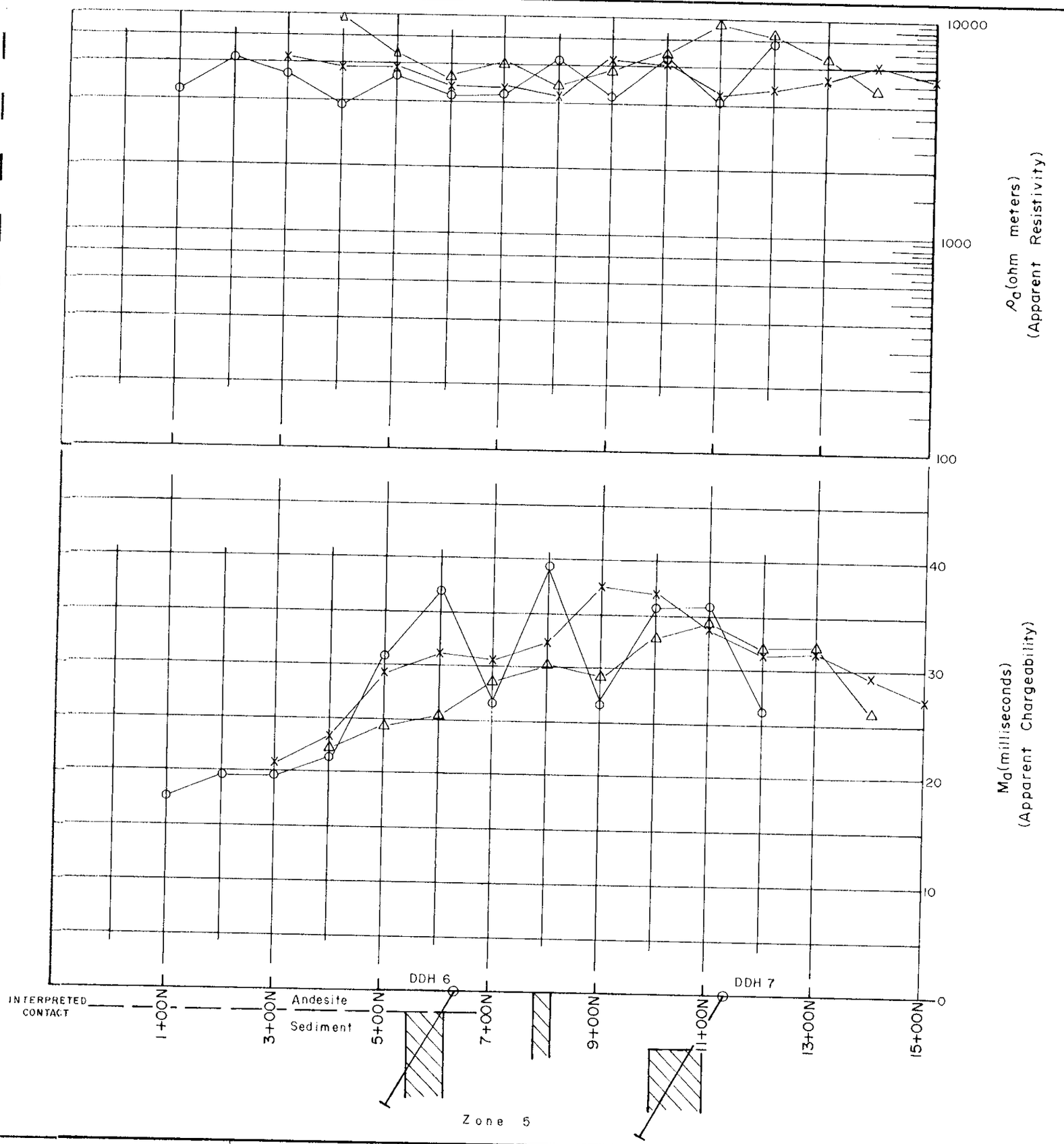
EXPLORATION SERVICES LIMITED

Earth Sciences Division

CALGARY CANADA

JOB No. PC1227

DWG No. 1227 B/5



INDUCED POLARIZATION SURVEY

DETAIL PROFILE: LINE - 14 W

THE GRANBY MINING COMPANY LIMITED
WET CLAIM GROUP, GRAND FORKS, B.C.

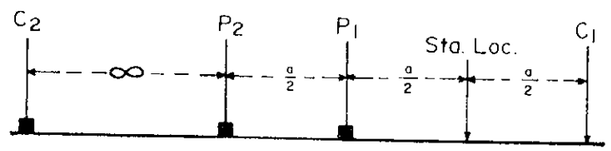
LEGEND

INTERPRETED CAUSATIVE BODY

RECOMMENDED D.D. HOLE

a = 50'
a = 100'
a = 200'
a = 400'

POLE - DIPOLE ARRAY



Horizontal Scale: 1 inch : 200 feet.
Vertical Scales:
Chargeability — 1 inch : 10 milliseconds
Resistivity — 2 inches: 1 logarithmic cycle (ohm-meters)

INSTRUMENT PARAMETERS

ON	1.5 secs.
OFF	1.0 secs.
DELAY	0.015 secs.
INTEGRATE	0.4 secs.

To accompany report by:

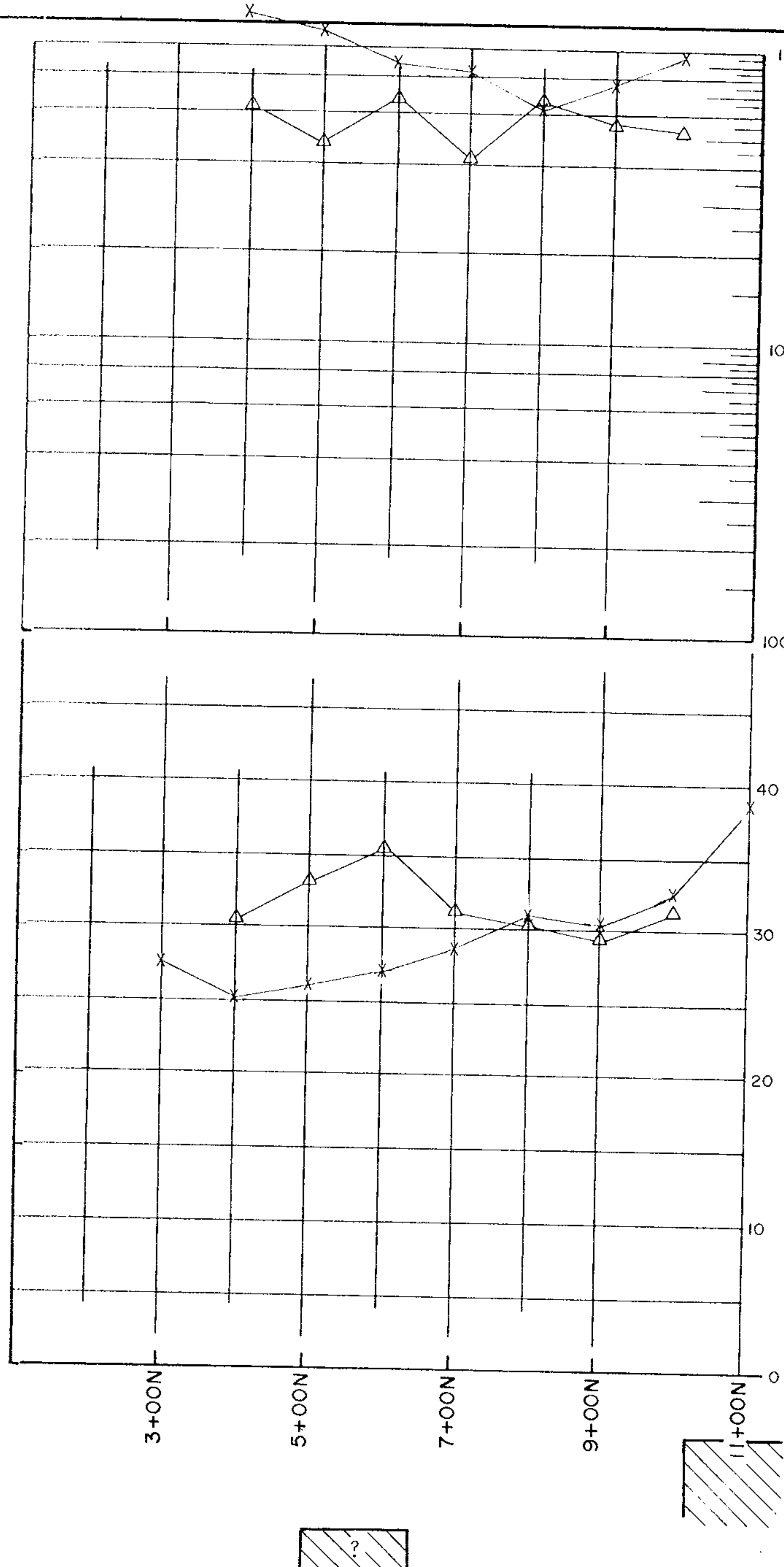
Andrew R. Dodds B. Sc. P. Geoph.
Geophysicist

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
J. D. PRENDERGAST
Expiry Date: May 31st, 1972

KENTING
EXPLORATION SERVICES LIMITED
Earth Sciences Division
CALGARY CANADA

JOB No. PC 1227

DWG No. 1227 B/6



INDUCED POLARIZATION SURVEY

DETAIL PROFILE: LINE - 18 W

THE GRANBY MINING COMPANY LIMITED
WET CLAIM GROUP, GRAND FORKS, B.C.

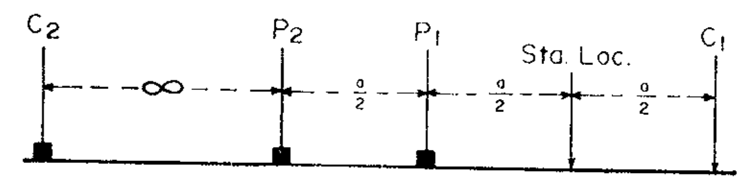
LEGEND

INTERPRETED CAUSATIVE BODY

RECOMMENDED D.D. HOLE

a = 50'
a = 100'
a = 200'
a = 400'

POLE - DIPOLE ARRAY



Horizontal Scale: 1 inch : 200 feet.
Vertical Scales:
Chargeability – 1 inch: 10 milliseconds
Resistivity – 2 inches: 1 logarithmic cycle (ohm-meters)

INSTRUMENT PARAMETERS

ON	1.5 secs.
OFF	1.0 secs.
DELAY	0.015 secs.
INTEGRATE	0.4 secs.

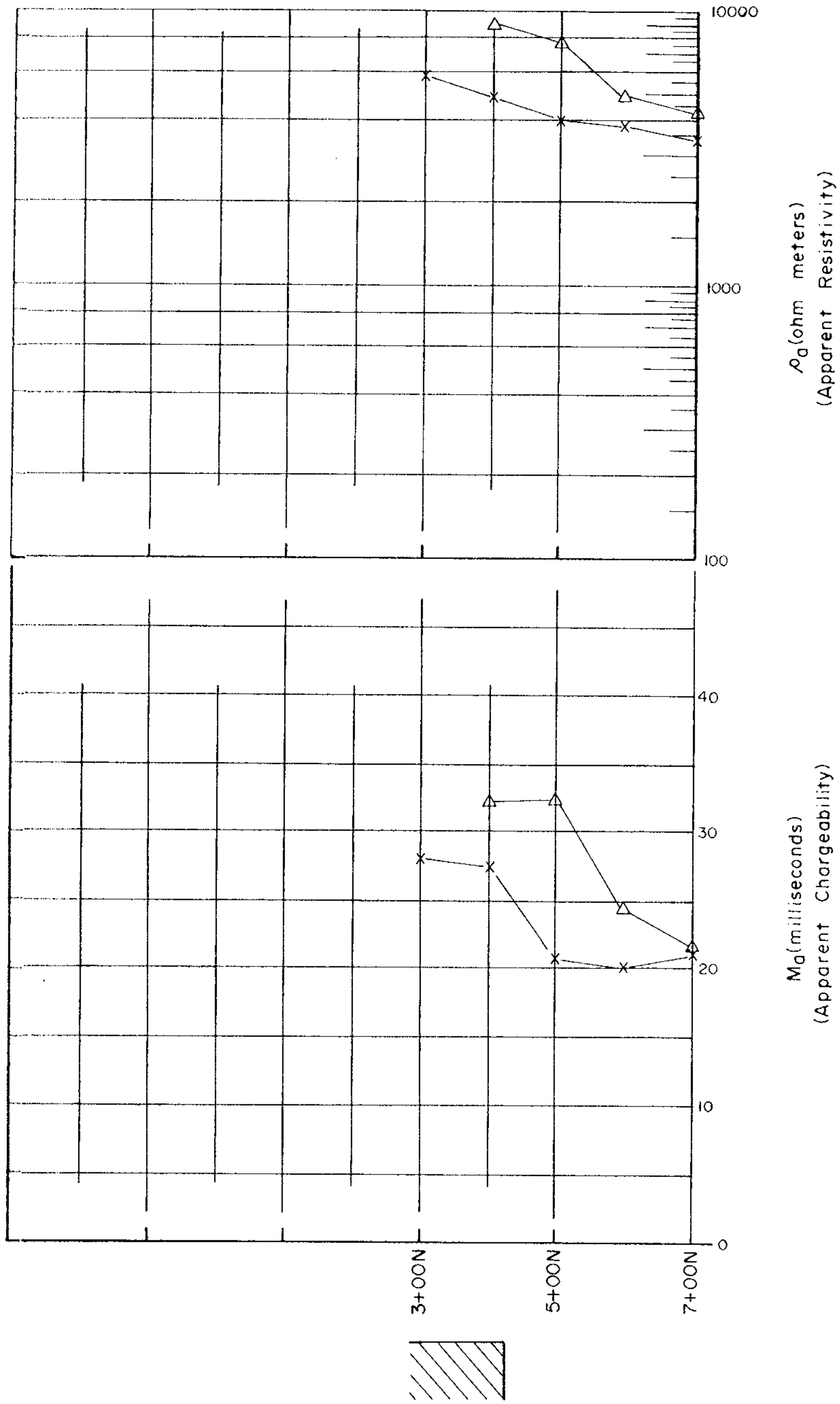
PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA J. B. PRENDERGAST
Expiry Date: May 28, 1971

To accompany report by:

Andrew R. Dodds B.Sc. P. Geoph.
Geophysicist

KENTING
EXPLORATION SERVICES LIMITED
Earth Sciences Division
CALGARY CANADA

JOB No. PC 1227
DWG No. 1227B/7



INDUCED POLARIZATION SURVEY

DETAIL PROFILE: LINE - 22 W

THE GRANBY MINING COMPANY LIMITED

WET CLAIM GROUP, GRAND FORKS, B.C.

LEGEND

INTERPRETED CAUSATIVE BODY

RECOMMENDED D.D. HOLE

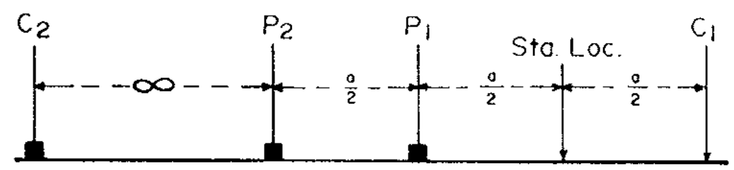
a = 50'

a = 100'

a = 200'

a = 400'

POLE - DIPOLE ARRAY



Horizontal Scale: 1 inch : 200 feet.

Vertical Scales:

Chargeability — 1 inch: 10 milliseconds

Resistivity — 2 inches: 1 logarithmic cycle (ohm-meters)

INSTRUMENT PARAMETERS

ON	1.5 secs.
OFF	1.0 secs.
DELAY	0.015 secs.
INTEGRATE	0.4 secs.

PROFESSIONAL ENGINEER, PROVINCE OF BRITISH COLUMBIA, J. B. PRENDERGAST

Expiry Date: May 28 [illegible]

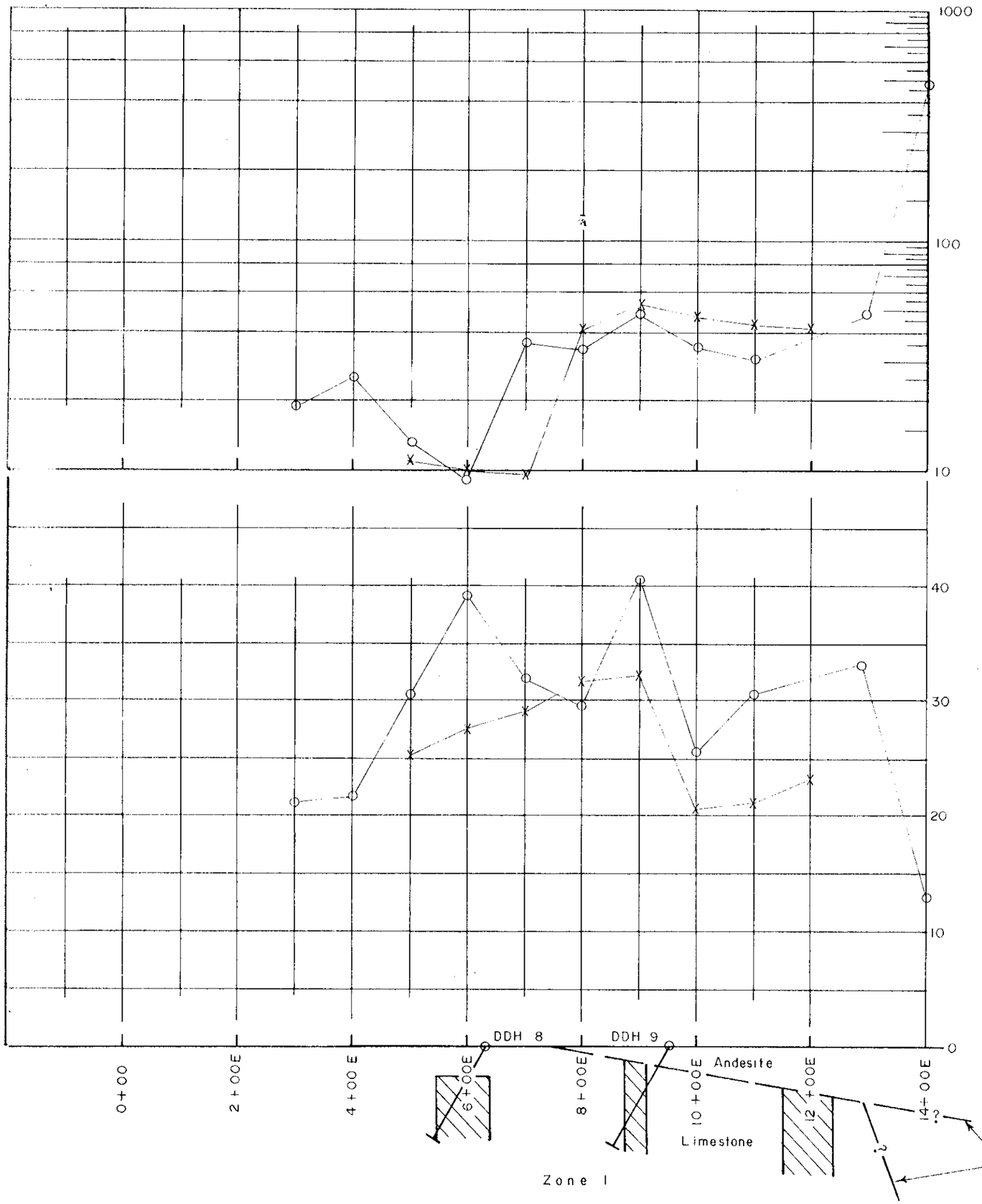
To accompany report by:

Andrew R. Dodds B.Sc. P. Geoph.
Geophysicist

KENTING
EXPLORATION SERVICES LIMITED
Earth Sciences Division
CALGARY CANADA

JOB No PC 1227

DWG No. 1227 B/8



INDUCED POLARIZATION SURVEY

DETAIL PROFILE: LINE - 22S

THE GRANBY MINING COMPANY LIMITED

HOPE CLAIM GROUP, GRAND FORKS, B.C.

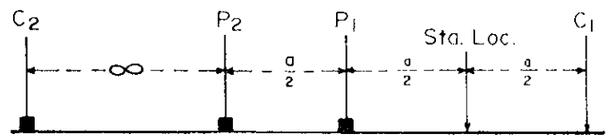
LEGEND

INTERPRETED CAUSATIVE BODY

RECOMMENDED D.D.HOLE

a = 50'
a = 100'
a = 200'
a = 400'

POLE - DIPOLE ARRAY



Horizontal Scale: 1 inch : 200 feet.

Vertical Scales:

Chargeability — 1 inch : 10 milliseconds

Resistivity — 2 inches: 1 logarithmic cycle (ohm-meters)

INSTRUMENT PARAMETERS

ON	1·5 secs.
OFF	1·0 secs.
DELAY	0·015 secs.
INTEGRATE	0·4 secs.

To accompany report by:

Andrew R. Dodds

Andrew R. Dodds, B.Sc., P.Geoph.

Geophysicist.

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA A. B. PRENDERGAST

Expiry Date: May 28, 1976

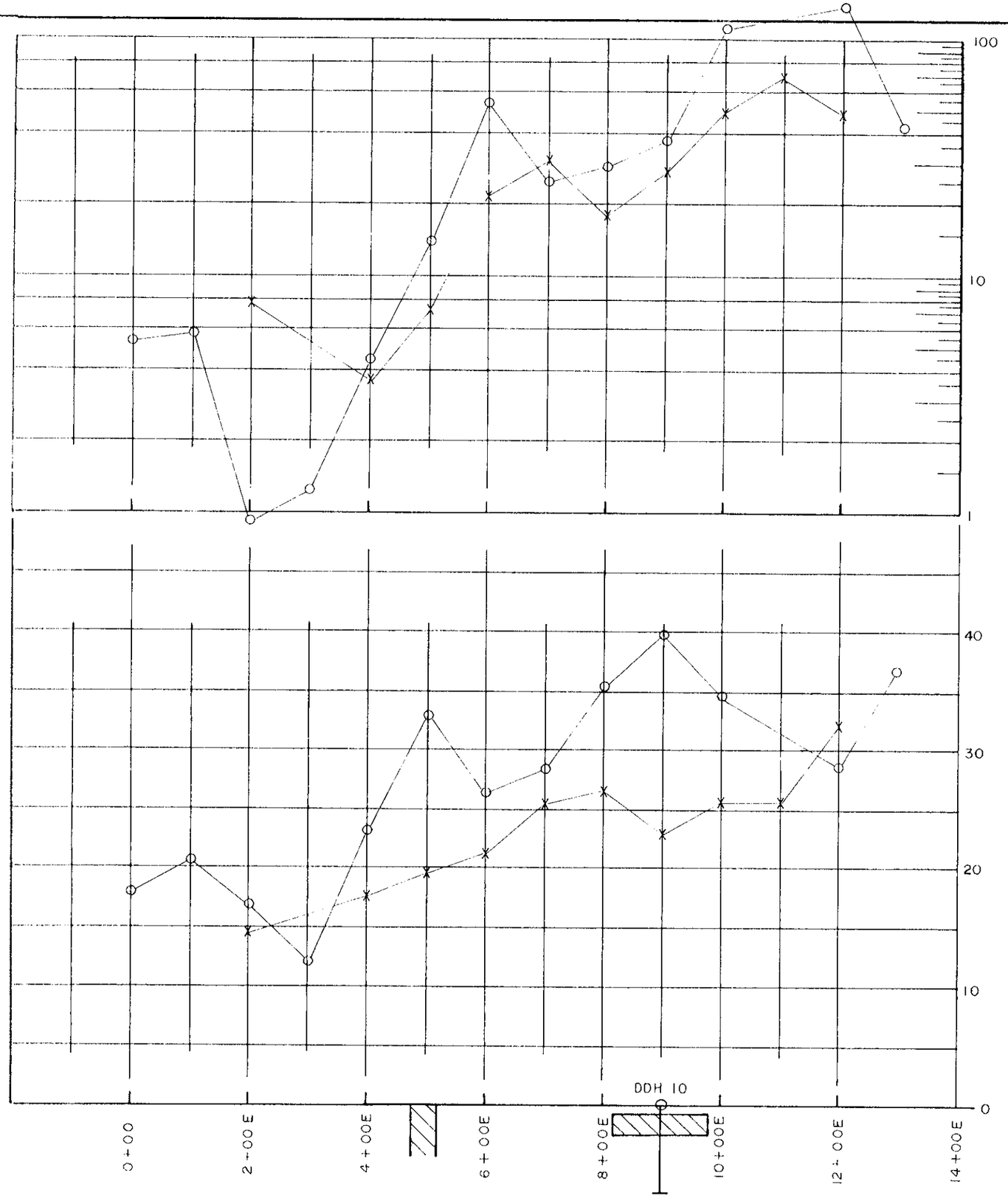
KENTING EXPLORATION SERVICES LIMITED

Earth Sciences Division

CALGARY CANADA

JOB Nº P.C. 1227C

DWG Nº 1227C - 4



INDUCED POLARIZATION SURVEY

DETAIL PROFILE: LINE - 32S

THE GRANBY MINING COMPANY LIMITED

HOPE CLAIM GROUP, GRAND FORKS, B.C.

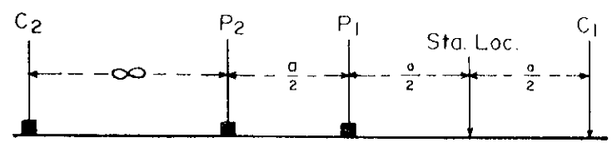
LEGEND

INTERPRETED CAUSATIVE BODY

RECOMMENDED D.D HOLE

a = 50'
a = 100'
a = 200'
a = 400'

POLE - DIPOLE ARRAY



Horizontal Scale: 1 inch : 200 feet.

Vertical Scales:

Chargeability — 1 inch : 10 milliseconds

Resistivity — 2 inches: 1 logarithmic cycle (ohm-meters)

INSTRUMENT PARAMETERS

ON	1·5 secs.
OFF	1·0 secs.
DELAY	0·015 secs.
INTEGRATE	0·4 secs.

To accompany report by:

Andrew R. Dodds, B.Sc., P.Geoph.
Geophysicist.

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
J. R. PRENDERGAST
Expiry Date: May 28/ 1970

KENTING
EXPLORATION SERVICES LIMITED
Earth Sciences Division
CALGARY CANADA

JOB Nº P.C. 1227C

DWG Nº 1227C-5

ZONE 5

ZONE 4

ZONE 3

ZONE 3

ZONE 2

ZONE 1

EAGLE BASELINE

MK I RECEIVER

MK II RECEIVER

B/L 1

B/L 1

N

a = 400 feet

C1 NORTH
Sta. Loc.
P1
P2 SOUTH
C2

NOTE: Eagle Mountain Grid
C1 to the East

LEGEND

PORTION OF LINE COVERED BY DETAIL SURVEYING

M_0 (MK II) $\simeq$ M_0 (MK I) x 1·5

APPROXIMATE OUTLINE OF ANOMALOUS ZONE

INTERPRETED LOCATION OF ANOMALOUS SOURCE FROM DETAILING

2768 M-2

THE GRANBY MINING COMPANY LIMITED
WET AND EAGLE CLAIM GROUPS GRAND FORKS, B.C.

INDUCED POLARIZATION SURVEY
APPARENT CHARGEABILITY CONTOURS
CONTOUR INTERVAL = 2·0 milliseconds.

To accompany report by
A.R. Dodds, B.Sc., Geophysicist.

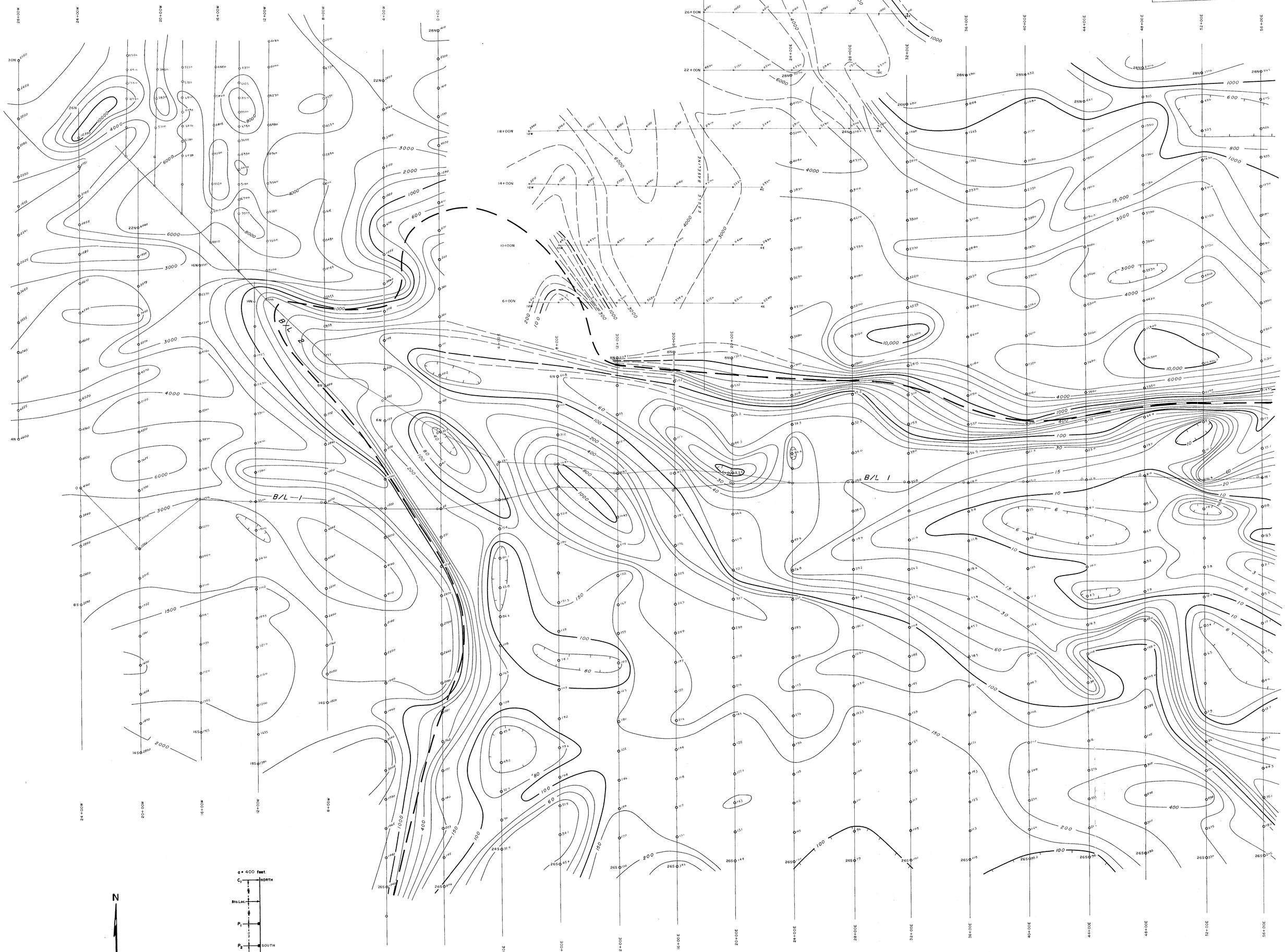
KENTING EXPLORATION SERVICES LIMITED
Earth Sciences Division
CALGARY CANADA

INSTRUMENT PARAMETERS

ON	1·5	4·5 secs
OFF	0·5	1·0 secs
DELAY	0·05	0·005 secs
INTEGRATE	0·4	0·4 secs

MK I MK II Expiry Date: May 26, 1971

SCALE 1 inch = 200 feet | DRAWN M.C. | DATE JULY 1970
JOB No. P.C. 1227 | DWG No. 12278-1



LEGEND

OUTLINE OF LOW RESISTIVITY

AREA - BEDDED LIMESTONE?

2768 M-3

THE GRANBY MINING COMPANY LIMITED

WET AND EAGLE CLAIM GROUPS, GRAND FORKS, B.C.

INDUCED POLARIZATION SURVEY

APPARENT RESISTIVITY CONTOURS

Contours at (logarithmic intervals) 150, 200, 300, 400, 600, 800, 1000 etc ohm x meters

To accompany report by: A. R. Dodds, B.Sc., Geophysicist.

INSTRUMENT PARAMETERS		
ON	1.5	1.5 secs.
OFF	0.5	1.0 secs.
DELAY	0.03	0.05 secs.
INTEGRATE	0.4	0.4 secs.
	MK I	MK II

Kentina EXPLORATION SERVICES LIMITED
Earth Sciences Division
CALGARY CANADA

Expiry Date May 1st 1971

SCALE: 1 inch = 200 feet	DRAWN: M.C.	DATE: JULY 1970
JOB No.: P.C. 1227		DWG. No.: 12278-2

HOMESTAKE FR.
L 3167

HESPERUS
L 3057

MYRTLE
L 3019

EAGLE
L577

ALPHA
L 3174

CONNECTION
L954

CRESCENT
L3383

THE LAYOVER
L 434

BULLER
L3242

DENVER
L2169

BASELINE

EAGLE

WET 1 WET 2 WET 3 WET 4 WET 5 WET 6 WET 7 WET 8 WET 9 WET 10 WET 11 WET 12 WET 13 WET 14 WET 15 WET 16 WET 17 WET 18 WET 19 WET 20 WET 21 WET 22 WET 23 WET 24 WET 25 WET 26 WET 27 WET 28 WET 29

N

LEGEND

2768 M-4

THE GRANBY MINING COMPANY LIMITED
WET CLAIM GROUP, GRAND FORKS, BC

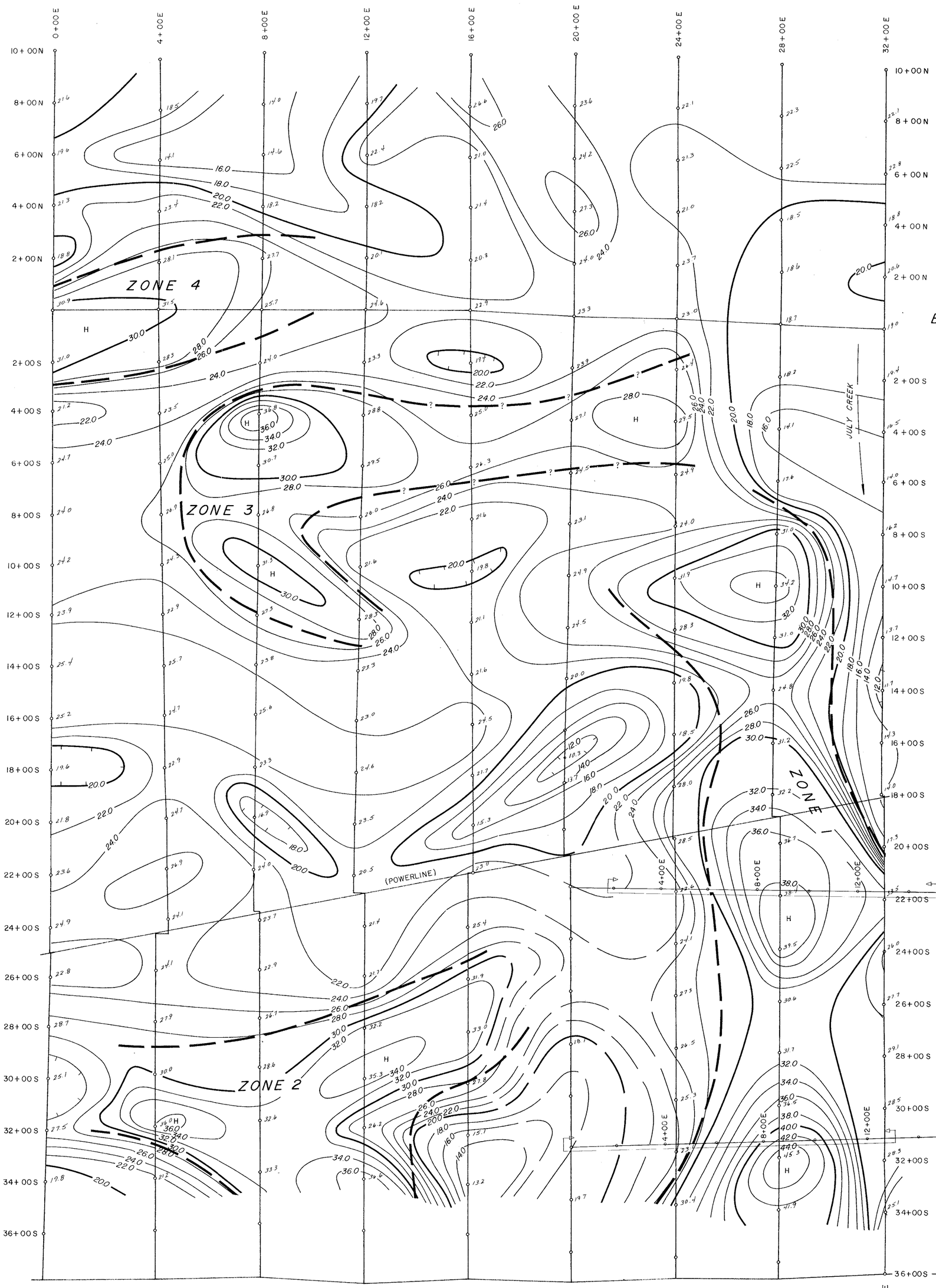
INDUCED POLARIZATION SURVEY

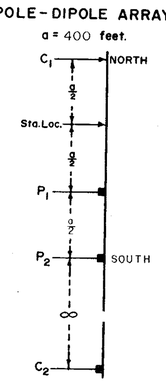
CLAIMS GROUPS

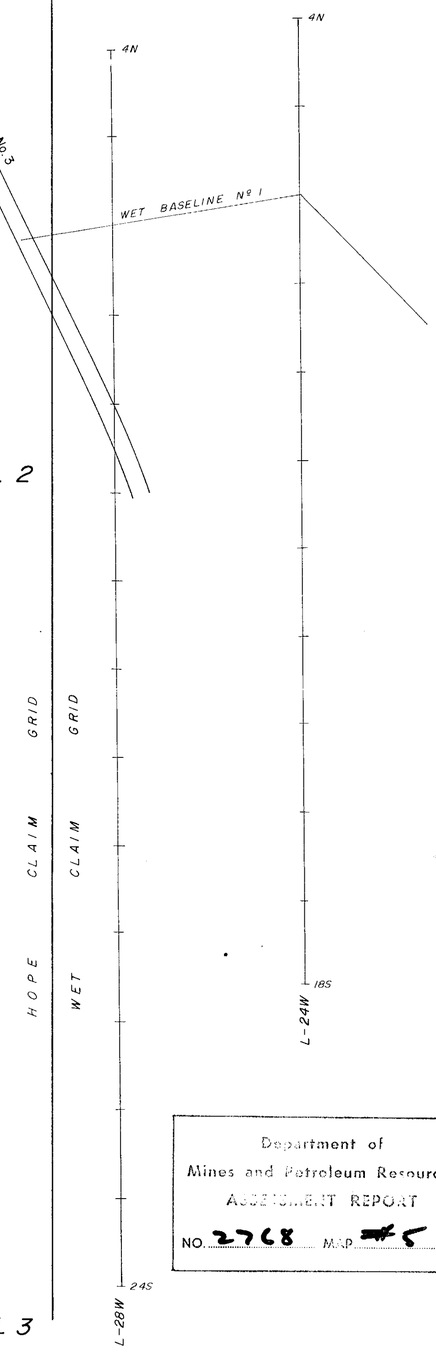
To accompany report by:
A. R. Dodds, B.Sc., Geophysicist.

KENTING EXPLORATION SERVICES LIMITED
Earth Sciences Division
CALGARY CANADA

SCALE: 1 inch = 200 feet	DRAWN: M.C	DATE:	
JOB No.: P C 1227		DWG. No.: 12278 - 3	







Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 2768 MAP. M-5

INSTRUMENT PARAMETERS

ON	1.5 secs.
OFF	1.0 secs.
DELAY	0.015 secs.
INTEGRATE	0.4 secs.

LEGEND

PORTION OF LINE COVERED BY DETAIL SURVEYING

ZONE 1

APPROXIMATE OUTLINE OF ANOMALOUS ZONE

2768 M-5

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — A. R. DODDS
Expiry Date: May 31st 1971

THE GRANBY MINING COMPANY LIMITED

HOPE CLAIM GROUP, GRAND FORKS, B.C.

INDUCED POLARIZATION SURVEY

APPARENT CHARGEABILITY CONTOURS

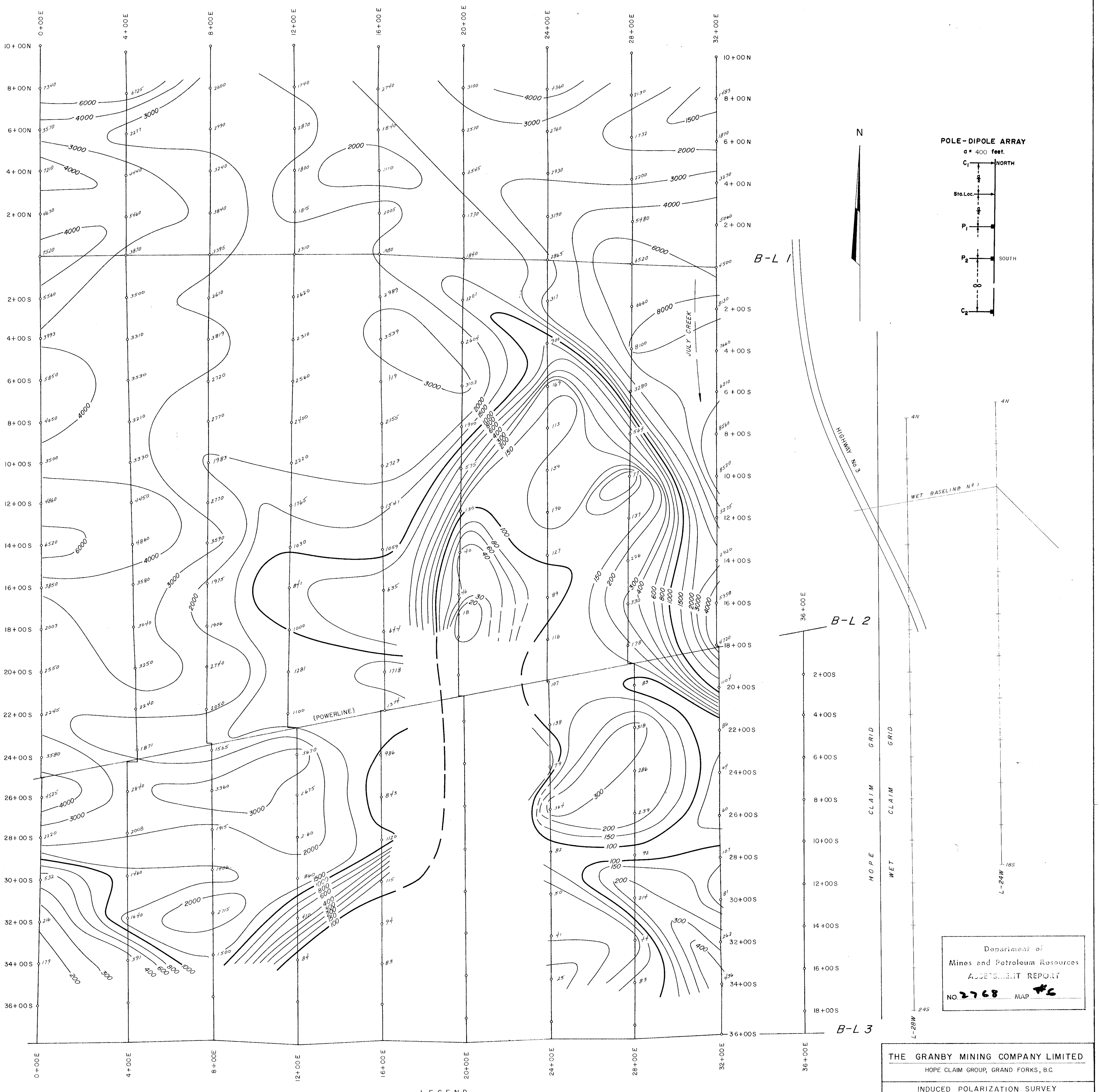
CONTOUR INTERVAL 2.0 milliseconds

To accompany report by: A. R. Dodds

A. R. Dodds B.Sc. Geophysicist

KENTING EXPLORATION SERVICES LIMITED
Earth Sciences Division
CALGARY CANADA

SCALE: 1inch = 200 feet	DRAWN: V.L.	DATE: Aug. 1970
JOB No: PC 1227		DWG No: 1227C-1



LEGEND

INSTRUMENT PARAMETERS	
ON	1.5 secs.
OFF	1.0 secs.
DELAY	0.015 secs.
INTEGRATE	0.4 secs.

2768 M-6

THE GRANBY MINING COMPANY LIMITED
HOPE CLAIM GROUP, GRAND FORKS, B.C.

INDUCED POLARIZATION SURVEY
APPARENT RESISTIVITY CONTOURS
Contours at (logarithmic intervals) 100,150,200,300,400,600,800,1000 etc.
ohm – meters

To accompany report by: A. R. Dodds B.Sc. Geophysicist

KENTING EXPLORATION SERVICES LIMITED
Earth Sciences Division
CALGARY CANADA

SCALE: 1 inch = 200 feet	DRAWN: V.L.	DATE: Aug. 1970
JOB No. PC 1227		DWG No.: 1227C-2

HOPE 1

HOPE 2

HOPE 3

HOPE 4

HOPE 5

HOPE 6

HOPE 7

HOPE 8

(POWERLINE)

JULY CREEK

HIGHWAY No. 3

WET BASELINE No. 1

WET 800 FRACTION

WET 700 FRACTION

WET 400 FRACTION

WET 500 FRACTION

WET 26

WET 25

B-L 1

B-L 2

B-L 3

L-24W

L-28W

HOPE CLAIM

WET CLAIM

GRID

GRID

4N

185

245

N

0+00 E
4+00 E
8+00 E
12+00 E
16+00 E
20+00 E
24+00 E
28+00 E
32+00 E
36+00 E

10+00 N
8+00 N
6+00 N
4+00 N
2+00 N
2+00 S
4+00 S
6+00 S
8+00 S
10+00 S
12+00 S
14+00 S
16+00 S
18+00 S
20+00 S
22+00 S
24+00 S
26+00 S
28+00 S
30+00 S
32+00 S
34+00 S
36+00 S

LEGEND

Department of Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 2768 M.P. M-7

THE GRANBY MINING COMPANY LIMITED

HOPE CLAIM GROUP, GRAND FORKS, B.C.

INDUCED POLARIZATION SURVEY

CLAIMS MAP

To accompany report by: Robert R. Dodds

A. R. Dodds B. Sc. Geophisicist

KENTING EXPLORATION SERVICES LIMITED
Earth Sciences Division
CALGARY CANADA

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA J. B. PRENDERGAST
Expiry Date: May 28, 1971

SCALE: 1 inch = 200 feet	DRAWN: V.L.	DATE: Aug. 1970
JOB No.: PC 1227		DWG. No.: PC 1227C-3

2768 M-7