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REPORT ON
GEOPHYSICAL SURVEYS
RED CLAIM GROUP

West Redonda Island, B. C.
Vancouver Mining Division

92K/7W

by

A. I. Betmanis, P. Eng.

REPORT ON

GEOPHYSICAL SURVEYS
Including Physical Work

Of The

RED CLAIM GROUP

West Redonda Island, B. C.

Vancouver Mining Division

by

A. I. Betmanis, BASc., P. Eng.

Claims:	Red Group: Red 1-4, Red 9-10, Tish 1-5
Location:	Northwest corner West Redonda Island, 24 miles northeast of Campbell River, B. C. Latitude 50°17' N; Longitude 124°50' W.
Dates:	September 29, 1972 - November 4, 1972.

GEOPHYSICAL ENGINEERING LIMITED

January 22, 1973 Vancouver, B. C.

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INTRODUCTION

The following report is based on work done by Geophysical Engineering and Surveys Limited for Teck Corporation Limited on a group of mineral claims located for copper and molybdenum at the northwest corner of West Redonda Island, British Columbia. The claims, Red 1-4, 9-10, and Tish 1-5, cover pyrite with chalcopyrite and molybdenum mineralized intrusive rocks.

The work done during 1972 on the property consisted of line cutting and limited magnetic and electomagnetic surveying. Five claims, Tish 1-5, were staked at the start of the 1972 program to cover adjoining ground where previous Red claims had lapsed.

The magnetometer survey was made along two base lines running the length of the property. It was a pilot survey for later surveying of the property after all lines were cut, and provided an indication of magnetic relief and supplied control for surveying of the lines. The electromagnetic survey was a test survey to locate suitable VLF transmitting stations for locating possible conductors that may occur on the property.

Because of adverse weather conditions, the work had to be abandoned before being entirely completed.

The program was directed by W. R. Bergey and supervised by A. I. Betmanis of Geophysical Engineering and Surveys Limited for Teck Corporation Limited.

LOCATION AND ACCESS

The claim group covers the northwest slope of Mount Perritt, at the northwest corner of West Redonda Island, in the Vancouver Mining Division of British Columbia. It lies 24 air miles northeast of Campbell River. The claims are centred around latitude 50° 17' N and longitude 124° 50' W.

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LOCATION MAP

RED CLAIM GROUP
Vancouver Mining Division - B.C.

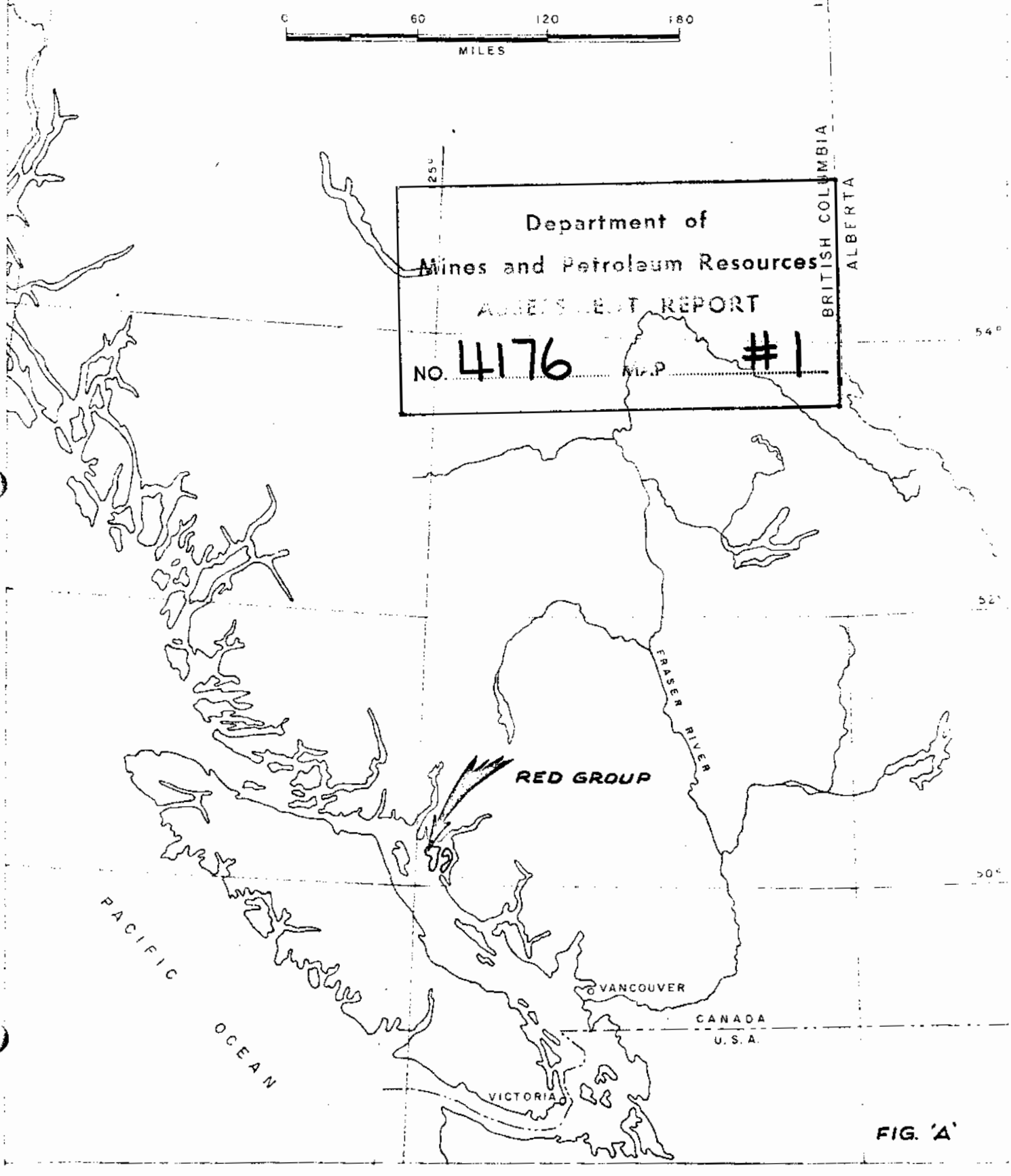

FIG. 'A'

The claims are most readily accessible by helicopter from Campbell River. Landing is possible at various widened sections of an old logging road which passes through the property. Access is also possible by boat to Redonda Bay, where there is a government wharf. However, the logging road from Redonda Bay to the property climbs about 2,500 feet in 5 miles, and is heavily overgrown, and partly washed out. The island is uninhabited.

The topography in the area is exceptionally rugged, with frequent 45° slopes, and numerous vertical cliff faces. Most of the claim area has been logged, and there is a new growth through rotting slash and windfall. Working in these conditions is exceptionally slow, and liberal time must be allotted for any exploration program.

CLAIMS

The property consists of six Red claims (RED 1-4, and RED 9-10) and five Tish claims (TISH 1-5). The Red and Tish claims were grouped January 18, 1973 to form the RED GROUP.

The Red claims were staked by J. C. Stephen for Mastodon-Highland Bell Mines Ltd., and were later acquired by Teck Corporation Limited. The Tish claims were staked by A. I. Betmanis for R. M. Butler, who holds them for Teck Corporation. The Tish claims were staked to cover some of the ground that had come open by expiry of previous Red claims.

Claim	Record No.	Expiry Date	Extended To*
Red 1-4	10403-06	July 14, 1973	July 14, 1978
Red 9-10	10411-12	July 14, 1973	July 14, 1978
Tish 1-5	21873-77	October 16, 1973	October 16, 1978

* Subject to granting of certificates of work.

Configuration of claims and area covered are shown on map 1051-1 accompanying this report.

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PREVIOUS WORK

The first work done on the property was in 1965 by Mastodon-Highland Bell Mines Ltd. The claim area, then consisting of fourteen Red claims, was mapped geologically, a geochemical soil survey was made, and a vertical loop electromagnetic survey was conducted over a portion of the property. (See Geological, Geochemical, and Geophysical Report on the Red Claim Group by W. R. Bacon, June 8, 1965; Assessment Report No. 638). Geologically and mineralogically the area looked interesting, several copper and molybdenum soil anomalies were outlined, and the EM survey picked up broad cross-overs. Further work was recommended, and additional claims, Red 15-30 were staked to cover the surrounding area.

In 1966, five hand and four bulldozer trenches were cut, and mineralized areas were drilled and blasted to obtain fresh samples. The physical work was recorded on Red 1-15, Red 17, and Red 19 claims.

No further work was done on the property until 1972, at which time all claims had expired except for Red 1-4, and Red 9-10. When work was started in 1972 on the existing Red claims, the Tish 1-5 claims were staked, and the line grid later extended to take in the new claims.

GENERAL GEOLOGY

The property area is underlain by dioritic intrusive rocks of the Coast Range batholith. Remnant blocks or roof pendants of volcanic rocks are included in the diorites northeast of the property. A sub-oval to triangular quartz porphyry, 450 - 800 feet in diameter intrudes the diorite south of base line 70'N between 50'E and 57'E. Either a hornblende porphyry and hornblende porphyry breccia, or a strongly hornblende altered and brecciated area strikes S 20^{o} E from 60'E on base line 70'N.

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The diorite has been moderately to strongly fractured and pyritized in the claim area. Fracturing locally approaches intense shattering. Strong fracturing is often accompanied by silicification.

Four mineralized zones were mapped in 1965 by Bacon:

Zone 'A': Copper and molybdenum mineralization at the western "nose" of the quartz porphyry.

Zone 'B': Copper and molybdenum mineralization in the hornblende diorite and breccia, with lithological or alteration boundaries.

Zone 'C': A small, poorly exposed zone of copper and minor molybdenum mineralization adjacent to and west of Zone 'B'.

Zone 'D': A large zone defined by strong fracturing, silicification and pyrite mineralization which contains erratic molybdenum in quartz veining and minor chalcopyrite.

Approximately two miles to the northeast of the property, in a direction parallel to conductors located by the 1965 EM survey, air photo linears, and major stream directions of the area, are crown granted claims covering high grade massive magnetite mineralization.

LINE CUTTING

A line grid was laid out to cover the Red claims. The grid was extended to include the Tish claims after they were staked. The line cutting was done by K. W. Davies, assisted by G. Culley.

Two east-west base lines were cut, 6800 feet each and 2000 feet apart, approximately across the slope of the land. The lines were cut by chainsaw, and picketing done by backsighting to obtain accurate control for plotting the cross lines.

A total of 11.5 miles of north-south picket lines were planned to be put in at 400 foot intervals, but due to an early snow and rugged terrain, two miles of these lines could not be cut, and had to be left for better spring weather.

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A corrected grid configuration in relation to claim boundaries is shown on Map 1051-1.

MAGNETOMETER SURVEY

A magnetometer survey of the base lines was made using a Scintrex MF-2 fluxgate magnetometer to measure vertical intensity in gammas. Values were obtained by reading stations every four hundred feet and looping back to the previous station read to correct for diurnal variation. The lines were then re-read at 100 foot stations, and readings corrected. The two base lines were then tied into each other by looping. The survey was carried out by A. I. Betmanis.

It was intended to continue the survey to include all cross lines if the base line surveys proved to show significant relief, but late in the program snow conditions made it impossible to loop between control stations in sufficient time to correct for diurnal variation.

Magnetic relief along the base lines is in the order of 2000 gammas. A broad magnetic low occurs on base line 70'N centred about mineralized Zone 'B'. On base line 50'N there is a low south of Zone 'D'. It is difficult to predict whether these magnetic expressions will be significant, but a complete survey of picket lines during a summer season appears justified.

ELECTROMAGNETIC SURVEY

A test electromagnetic survey of base line 70'N was done using a VLF-EM Radem unit manufactured by Crone Geophysics. It uses very low frequency (12 - 24 kilocycles) radio waves broadcast by the U.S. Navy. The data is recorded as inclinations of the electromagnetic field, and a conductor is indicated by a "cross-over" in the angle of inclination. The unit is fast and easy to use for a reconnaissance survey in rugged areas like the Red Group, but adjustments have to be made for topography to filter out misleading cross-overs.

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A filter operator was designed by Dr. D. C. Fraser, Chief Geophysicist of Geophysical Engineering and Surveys Limited, to phase shift the dip angle data by 90 degrees. It is a variation of the first derivative method for partially correcting for topography, and shows actual cross-overs as positive values. Negative filtered values are meaningless, and are not shown on Map 1051-3.

For efficient use of the VLF-EM method a transmitting station should be chosen which is in a direction on strike with the expected conductors, and the lines of traverse should be parallel to the primary field; that is, perpendicular to the direction to the transmitting station. The purpose of the test survey was to determine which transmitting stations could be received with sufficient field strength to obtain accurate readings of dip angles, and to determine whether strong conductors exist in other directions than indicated by the 1965 EM survey. The test survey was made by A. I. Betmanis.

Cutler, Maine (NAA) was the only transmitting station that could be picked up for approximately east-west striking conductors, but its field strength was insufficient to read dip angles at more than 10% of the stations. The strongest field strength was at station 80'E on base line 70'N, which corresponds to a northeast striking conductor picked up by the 1965 EM survey. The field strength decreased too rapidly each side of the conductor to give useful dip angle readings.

Lualualei, Hawaii would have been a suitable transmitting station for northeast to east-west conductors, but a crystal for that station was not available at the time of the survey. Although Hawaii is approximately the same distance away as Cutler, there is less topographic obstruction, and a stronger field strength would be obtained. A Radem survey, using Hawaii, and reading the field strength as well as dip angles would be useful in determining important structures or conductors.

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Seattle, Washington (NPG) was the only station that could be clearly read. The survey indicated a broad conductor at 63'E on base line 70'N. This would correspond to the eastern edge of mineralized Zone 'B'. It is also in the magnetic low surrounding Zone 'B'.

CONCLUSIONS AND RECOMMENDATIONS

A complete magnetometer survey may prove useful by indicating the strongest altered areas as magnetic lows. Hopefully, these would correspond to centres of mineralization, and thus have a greater probability of having chalcopyrite rather than pyrite mineralization.

Cutler, Maine gives too weak a signal to be useful for a VLF-EM survey. Using Hawaii as a transmitter, and reading field strengths as well as dip angles, structures or conductors which may have influenced mineralization could possibly be picked up.

Because of the abundance of pyrite in the area, most geophysical methods would not be of significant value in locating copper and molybdenum mineralization. Direct mapping of structures and alteration, evaluating the copper and molybdenum content in outcrop, assisted by geophysical methods that would indicate alteration and structure, may lead to defining more accurately mineralized zones that warrant further work. It is therefore recommended that:

1. Outcrops be mapped for alteration and structure.
2. Outcrops be sampled and analyzed for copper and molybdenum.
3. A magnetometer survey be made along all grid lines.
4. A VLF-EM Radem survey be made using Hawaii as a transmitting station.

Respectfully submitted,

A. I. Betmanis, P. Eng.

Vancouver, B. C.
January 22, 1973

APPENDIX I

AUTHOR'S CERTIFICATE

C E R T I F I C A T E

I, Andris I. Betmanis, do hereby certify that:

1. I am a geologist with residence at 1235 Deep Cove Road, North Vancouver, British Columbia.

2. I am a graduate of the University of Toronto, with the degree of BASc. in Applied Geology in 1965.

3. I am a Professional Engineer registered in the Provinces of British Columbia and Ontario.

4. From graduation to present I have been employed as a geologist with Geophysical Engineering and Surveys Limited.

5. From September to November, 1972, I supervised the physical work, and conducted the geophysical surveys described in this report.

A. I. Betmanis
January 22, 1973

A P P E N D I X II

PERSONNEL AND DATES

Name and Address	Position	Employed From-To	Days Worked
A. I. Betmanis, 1235 Deep Cove Road, North Vancouver, B. C.	Geologist	Sept. 29/72-Jan. 22/73	26
K. W. Davies, 159 Riverside Drive, North Vancouver, B. C.	Line-cutter	Sept. 29/72-Nov. 4/72	37
G. Culley, 4869 - 6th Avenue, Delta, B. C.	Assistant	Sept. 29/72-Nov. 4/72	37

APPENDIX III

COST OF WORK

COST OF WORK

Supervision		
A. I. Betmanis	11 days @ $90/day	$ 990.00
Magnetometer Survey		
A. I. Betmanis	8 days @ $90/day	720.00
EM Survey		
A. I. Betmanis	3 days @ $90/day	270.00
Line Cutting		
K. W. Davies	37 days @ $50/day	1,850.00
G. Culley	37 days @ $23.50/day	869.50
Related Costs		
Camp costs and accommodation		673.90
Report preparation and drafting		428.02
Sundry		212.00
Helicopter Charges		
3.3 hours @ $260/hour		858.00
	TOTAL	$ 6,871.42

The above costs, other than helicopter charges, are property related costs only, and do not include preliminary compilation of previous data, administrative costs, transportation to and from Vancouver, and other costs not normally applicable for assessment credits.

Declared before me at the City of Vancouver, in the Province of British Columbia, this 23 day of January 1973, A.D.

A. I. Betmanis

A Commissioner for taking Affidavits within British Columbia or a Notary Public in and for the Province of British Columbia.

Sub-mining Recorder

N

L 32 E
L 36 E
L 40 E
L 44 E
L 48 E
L 52 E
L 56 E
L 60 E
L 64 E
L 68 E
L 72 E
L 76 E
L 80 E
L 84 E
L 88 E
L 92 E
L 96 E
L 100 E

RED 10
RED 1
RED 3
TISH 4
TISH 1
RED 9
BASE LINE 70 N
RED 2
RED 4
TISH 5
TISH 2
TISH 3
BASE LINE 50 N

Timber Logged

4176 M-2

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RED CLAIM GROUP

W. REDONDA ISLAND, BRITISH COLUMBIA

CLAIM AND GRID MAP

200 100 0 200 400 600 800 1000 FT

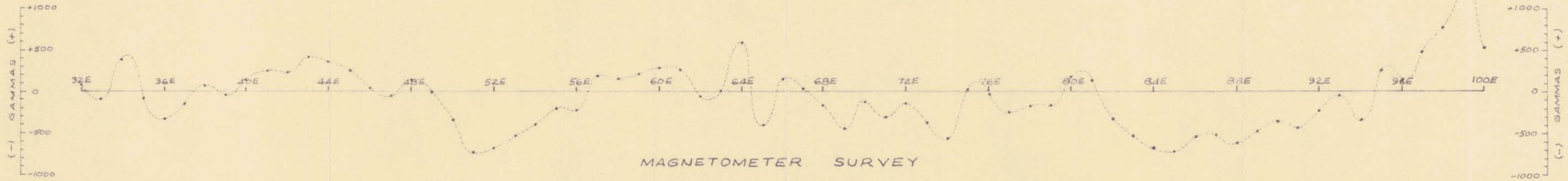
SCALE 1 IN. = 400 FT.

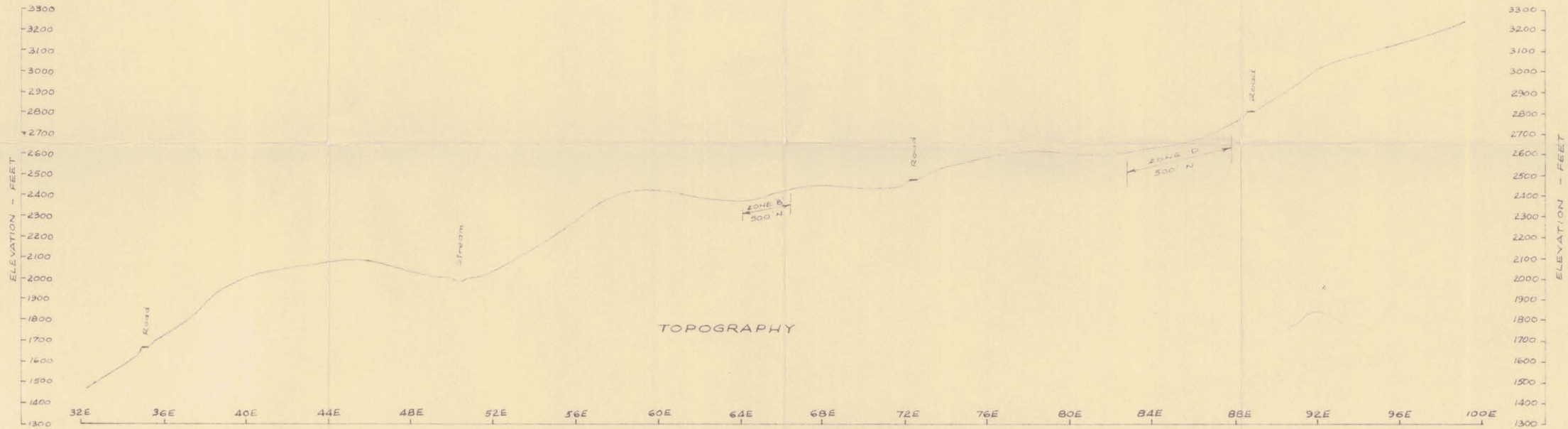
A.I. BETMANIS NOVEMBER 1972

To Accompany "Report on Geophysical Surveys, Red Claim Group, West Redonda Island, B.C."
By A.I. Betmanis, P.Eng.
Dated January 22, 1973.

A.I. Betmanis

Map Nº 1051-1





TECK CORPORATION LIMITED

RED AND TISH CLAIMS
WEST REDONDA ISLAND B.C.

GEOPHYSICAL SURVEYS
OF
BASE LINE 50N

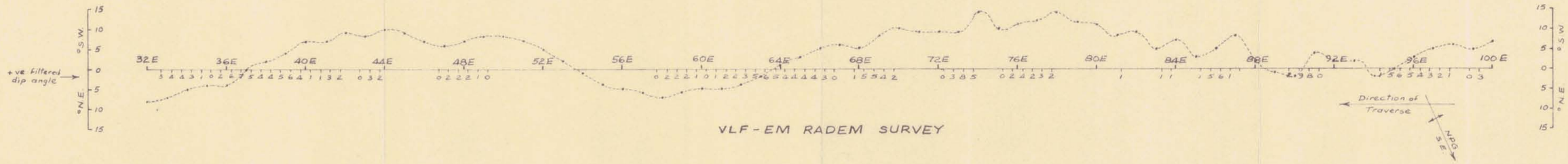
Scale : 1 in = 400 ft.

A.I. Betmanis November 1972.

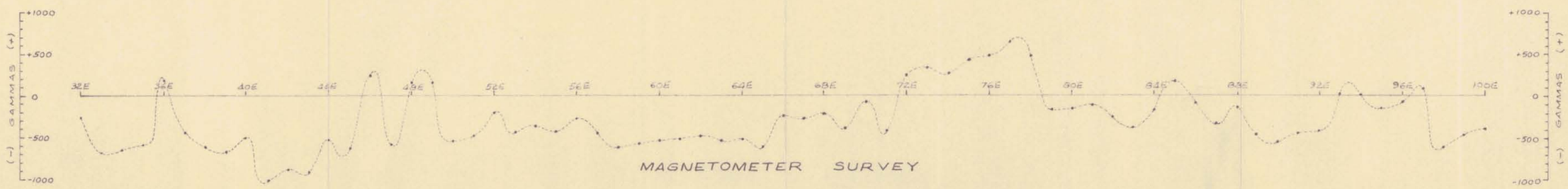
To Accompany "Report on Geophysical Surveys, Red Claim Group, West Redonda Island, B.C."
By A.I. Betmanis, P.Eng.
Dated January 22, 1973.

A.I. Betmanis

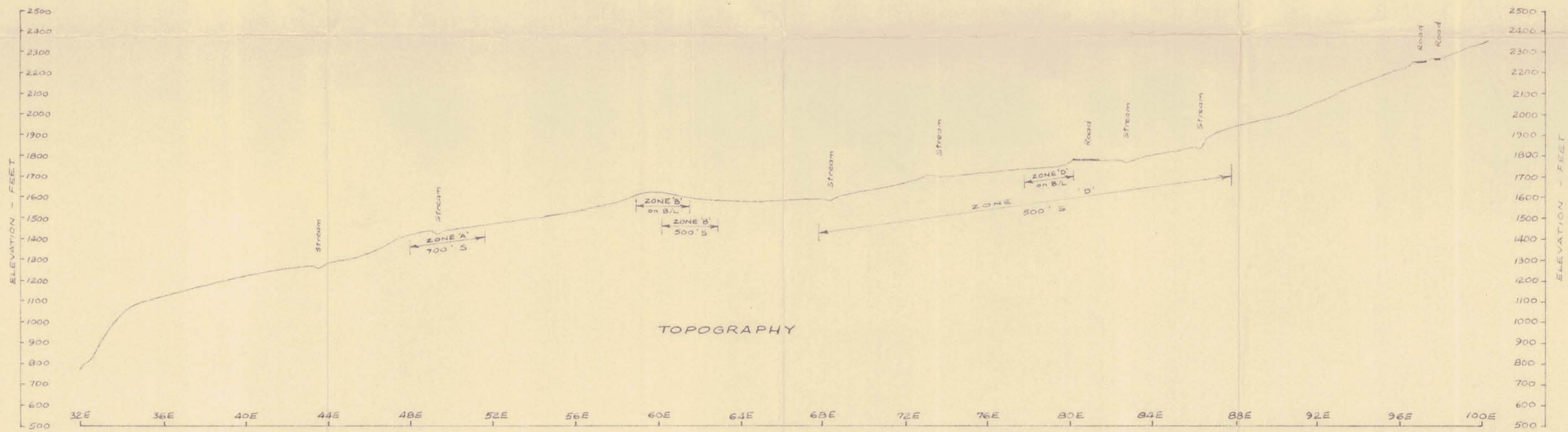
Map Nº 1051-2



VLF-EM RADEM SURVEY



MAGNETOMETER SURVEY



TOPOGRAPHY

TECK CORPORATION LIMITED.

RED AND TISH CLAIMS
WEST REDONDA ISLAND B.C.

GEOPHYSICAL SURVEYS
OF
BASE LINE 70N

Scale : 1 in = 400 ft.

A.I. Betmanis November 1972

To Accompany "Report on Geophysical Surveys, Red Claim Group, West Redonda Island, B.C."
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A.I. Betmanis

Map № 1051-3