2434

REPORT ON
AEROMAGNETIC SURVEY
TULAMEEN AREA, BRITISH COLUMBIA
ON BEHALF OF
COPPER RANGE EXPLORATION COMPANY LTD.

by

Richard O. crosby, B.Sc., P.Eng.

May 20, 1970

CLAIMS:
(see attched list)

LOCATION:
About 8 miles northwest of Tulameen, B.C.
New Westminster and Similkameen Mining Divisions
49° 120° NW

DATES:
March 22 to March 25, 1970

CLAIMS

WINDFALL	No. 1 Fr.
WINDFALL	1 - 42 (inclusive
IRA	1 - 60 (inclusive)
RA	1 - 34 (inclusive)
IR	1 - 50 (inclusive)
SC	1 - 4 (inclusive)
SC	9 - 16 (inclusive)
SC	25 - 28 (inclusive)
SC	33 - 58 (inclusive)
ML	1 - 27 (inclusive)
ML	28 Fr.
ML	29 Fr.
ML	30 - 33 (inclusive)
PRES	1 - 12 (inclusive)
SK	1 - 14 (inclusive)
SK	17 - 24 (inclusive)
SKF	No. 2 Fr.

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SUMMARY

The present airborne magnetic survey has indicated extensive zones interpreted as being underlain by porphyritic rocks which are known to carry sulphide mineralization in the survey area. Two alteration zones and major faulting have been interpreted.

REPORT ON
AEROMAGNETIC SURVEY
TULAMEEN AREA, BRITISH COLUMBIA
ON BEHALF OF
COPPER RANGE EXPLORATION COMPANY LTD.

INTRODUCTION

From March 22 through March 25, 1970, an airborne geophysical survey was executed on behalf of Copper Range Exploration Company Ltd. in the Tulameen area, British Columbia, covering approximately 10 square miles (see Plate 1).

The airborne survey consisted of magnetometer measurements using a Scintrex NPM-1 nuclear resonance, total intensity magnetometer.

Appendix "A", attached, gives full details of the airborne geophysical equipment and the ancillary equipment employed, as well as the treatment of data resulting from this survey. In the case of the present survey a Bell 47G3B1 helicopter, on charter from Okanagon Helicopters, was employed as the transport vehicle.

The survey lines were flown northwest-southeast at a nominal 500' line interval at a mean terrain clearance of 300 feet. The magnetometer sensor was flown 50 feet below the helicopter. Flight navigation and flight path recovery have been based upon a topographic map on the scale of approximately 1" = 500'. Sixty-two flight lines measuring a total of 120 line miles were flown on the present programme. The intensity of the earth's total magnetic field in the survey area measures approximately 58,000 gammas and the inclination of the total field vector is approximately 73 degrees. The purpose of the present survey was to obtain information relating to geologic structure and rock type.

PRESENTATION OF DATA

The results of the survey are shown on Plates 2 and 3, both on the scale of 1" = 500'.

Plate 2 shows the flight lines, magnetic contours and geophysical interpretation. Plate 3 shows the magnetic contours superimposed on the topography of the survey area. Magnetic data are contoured at a 20 gamma interval. Base datum is arbitrary.

The magnetometer data are presented together with altimeter and fiducial recording on a dual trace Moseley recorder.

The vertical scale of the magnetic trace is 1" = 100 gammas with automatic steps of 500 gammas.

GEOLOGY

A description of the geology of the area including the present survey grid is found in G.S.C. Memoir 243 "Geology and Mineral Deposits of the Princeton Map-Area, British Columbia", by H.M.A. Rice, 1960. The map accompanying this report reveals that most of the area is underlain by Upper Triassic volcanics, sediments and metamorphic rocks of the Nicola group. The Nicola group rocks have been intruded by a granodioritic batholith, the Eagle granodiorite. Along the contact of the granodiorite and the Nicola rocks are irregular bodies and plugs of various types of quartz-feldspar porphyry. These deposits occur as quartz veins carrying galena, sphalerite, pyrite and minor amounts of other sulphides in sheared Nicola rocks bordering the granodiorite. Drilling results provided by Copper Range on the Independence Property indicated copper intersections which make the area also attractive as a large, low-grade copper or copper-molybdenum target area.

DISCUSSION OF RESULTS

The observed magnetic relief is a total of 2400 gammas and occurs primarily on sheet 2 Plate 3 in the southern part of the survey area as a broad, oval shaped anomalous zone containing two individual anomalies. The southernmost anomaly reaches a maximum of 3140 gammas approximately midway along L 13. The northern anomaly contains 3 sharp peaks recorded on L 23, L 25 and L 28. The maximum magnetic value of 3600 gammas was recorded on L 23 and L 25.

The magnetic field in the northern half of the survey grid is dominated by a elongate positive magnetic zone extending northward from L 41 to L 61, the last line on the grid. The zone measures about 1500' across its short dimension and reaches a maximum value of 1940 gammas on L 44 and L 62. This magnetic positive anomaly is bounded on the east and west by moderately intense negative anomalies. The remainder of the magnetic field is characterized by randomly oriented, relatively high-frequency anomalies of varying amplitudes, however considerably less than the previously mentioned anomalous areas.

GEOPHYSICAL INTERPRETATION

The rock types mapped in the survey area normally have sufficient magnetic susceptibility contrasts to enable them to be recognizable from one another. That is, all except the sediments (limestone, argillites, etc.) which are in most cases non-magnetic, and therefore not identifiable. Volcanic rocks, greenstones, adesites etc., are usually characterized by relatively high frequency randomly oriented magnetic anomalies, the intensity of the anomalies varying

according to the amount of magnetite, pyrrhotite and other magnetic minerals present.

Intrusive rocks are recognized generally by the shape of the magnetic anomalies and their areal extent, which can vary from a small circular anomaly associated with a cylindrical shaped intrusive to an extensive regional gradient found over large areas of homogeneous acidic intrusives.

Intrusive anomalies are usually categorized either as acidic, intermediate and basic, depending upon the intensity of the magnetic feature.

Faults are recognizable as magnetic linear zones along which individual anomalies or parts of anomalies have been distorted or displaced.

Plate 2 shows the interpretation of the magnetic data using, wherever possible, geological information made available by Mr. A. D. K. Burton of Copper Range.

The most striking feature of the interpretation is the intense anomalous area in the southern half of the grid interpreted as underlain by porphyritic rocks. This portion of the grid contains two areas which are interpreted as possible alteration zones and should therefore be checked for disseminated type sulphide mineralization.

The magnetic field of the northern half of the survey area is more contorted than the southern half due to numerous faults. Three major ones trending in a northerly direction have been interpreted, however many more are probably present. The numerous randomly oriented anomalies suggest extensive areas of volcanic rocks.

The northwest-southeast trending magnetic anomaly is interpreted as being due to porphyritic rocks. The flanking negative zones are the result of a normal induction anomaly caused by a nearly vertical "dike-like" body striking generally magnetic northwest-southeast and steeply dipping.

CONCLUSIONS AND RECOMMENDATIONS

The present airborne geophysical survey has indicated areas warranting further investigation. Among these are the two alteration zones interpreted in the southern portion of the grid, the extensive areas interpreted as being underlain by prophyritic rocks and fault zones.

In addition, positive anomalies in the vicinity of interpreted intrusive rocks should be investigated as possible skarn zones.

It is recommended that the areas mentioned above be field checked for evidence of sulphide mineralization and that the interpreted alteration zones be geochemically sampled for concentration of heavy metals.

Respectfully submitted,

SEIGEL ASSOCIATES LIMITED

Richard O. Crosby

Richard O. Crosby, B.Sc., P.Eng.
Geophysicist

Vancouver, B. C.
May 20, 1970

MAGNETOMETER - SCINTREX NPM-1

The Scintrex NPM-1 nuclear resonance airborne magnetometer is based on a Newmont modification of a Varian Associates magnetometer and is produced under license to both companies. It is a very light weight, solid state unit, especially designed for use in a helicopter or light fixed-wing aircraft where weight is an important consideration.

Its cycle period is 1.1 seconds. Each cycle it measures the total intensity of the earth's magnetic field and this quantity, in gammas, is recorded, in analogue form, on a suitable graphic recorder. The full scale sensitivity is usually 1000 gammas and the recorder automatically steps each 500 gammas. In very active areas a full scale sensitivity of 5000 gammas with steps of 2,500 gammas may be employed. Only the magnetic variations are actually recorded although the absolute base level may be established from the NPM-1 as well.

The magnetic sensing head may be on a cable as much as 100 ft. below the aircraft or, in some installations, may be rigidly attached to the aircraft on a suitable boom.

The intrinsic noise level of each reading is about 5 gammas.

Where it is intended to contour the NPM-1 information it is customary to fly tie lines across the survey grid. A fixed magnetic field monitor is often used as well, on the ground, primarily to indicate periods of magnetic storms during which the aeromagnetic data should be considered as unreliable.

The aeromagnetic data may be contoured if desired, using a contour interval of 25 gammas or up, depending on the amount of magnetic relief. Alternatively they may be used simply for purposes of correlation with simultaneously obtained electromagnetic data to determine which conductor zones are appreciably magnetic.

ANCILLARY EQUIPMENT

1. Altimeter

A Bonzer, high frequency solid state radioaltimeter is employed to continuously indicate the mean terrain clearance of the helicopter or other transporting aircraft. The altimeter is installed in the aircraft (unless otherwise indicated) so that the elevation of the sensing birds (electromagnetic or magnetic) will be less by the usual vertical displacement of these birds below the aircraft.

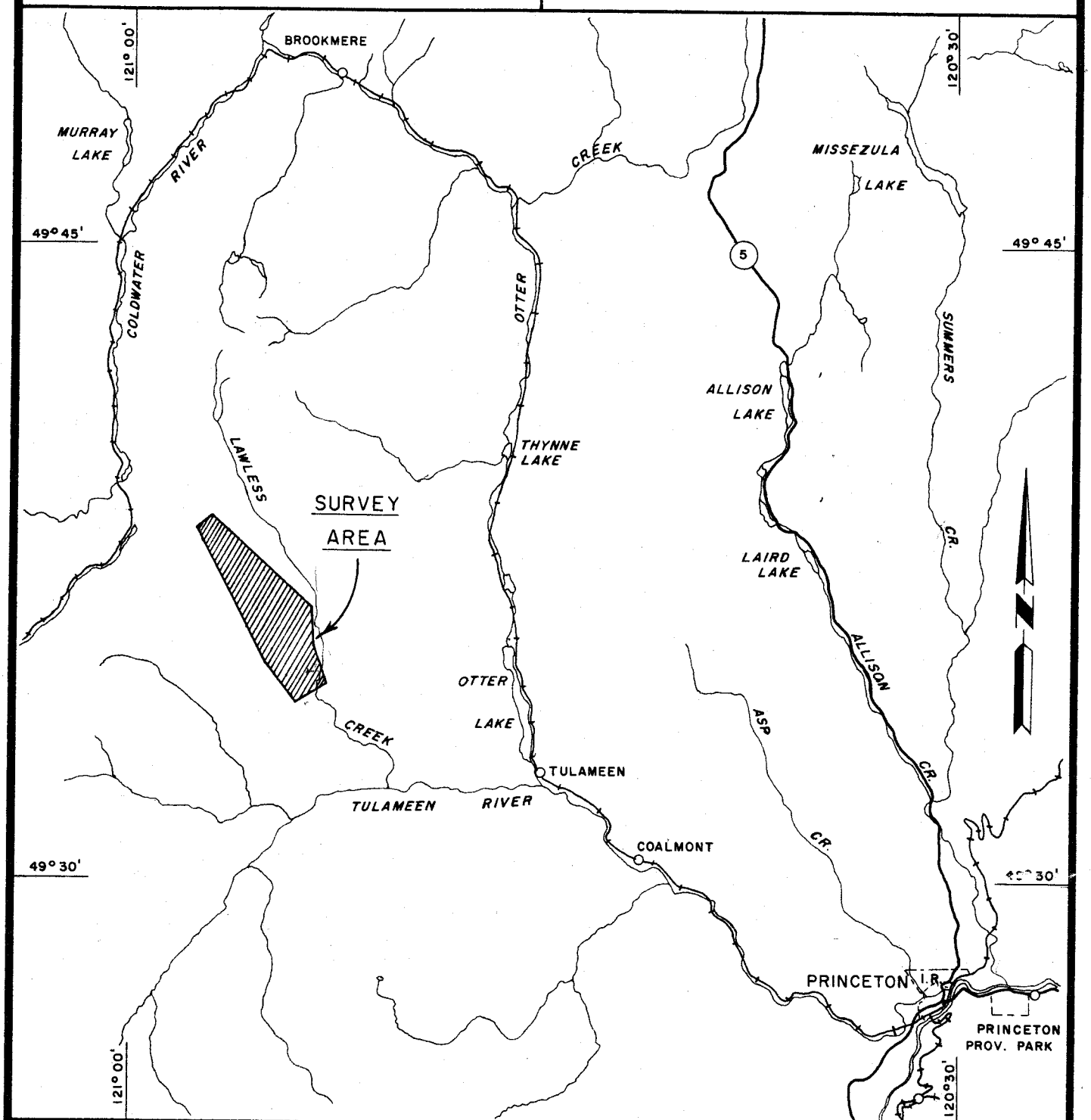
The output of the Bonzer may be expressed in analogue form on a suitable graphic recorder, or may be, for convenience, converted to a semi-digital form on a recorder side pen. In the latter event the altimeter record is a series of spaced pulses whose separation is proportional to the mean terrain clearance.

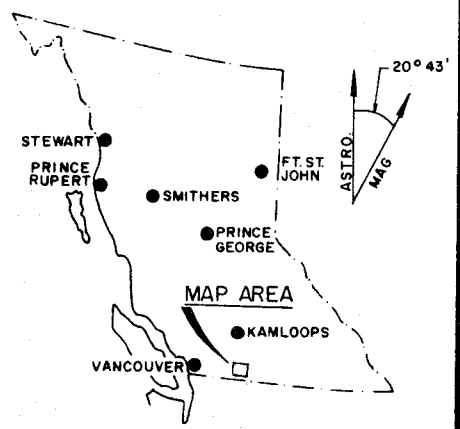
2. Positioning Camera

A Vinten Mark 3 16 mm positioning camera is employed with a wide angle lens. Photographs of the ground are taken with sufficient frequency to give a complete record of the flight path of the aircraft or helicopter. The frequency of exposure is controlled by the intervalometer referred to below.

3. Intervalometer

A Scintrex IA-2 intervalometer provides regularly spaced timing pulses which drive the positioning camera exposure mechanism and produces synchronous "fiducial marks" on the side pen of the geophysical graphic recorder or recorders. Because of the synchronization of the geophysical traces and the positioning camera it is then possible to relate the geophysical events of interest to their proper ground location. The timing pulse frequency may be adjusted in accordance with the ground speed of the aircraft so that an adequate flight path record is obtained.





BRITISH COLUMBIA

COPPER RANGE EXPLORATION COMPANY INC.

LOCATION MAP

AIRBORNE MAGNETOMETER SURVEY

IRISH-BRITCO PROPERTY, TULAMEEN AREA, B.C.

4 0 4 8

SCALE IN MILES

SURVEY BY

SEIGEL ASSOCIATES LIMITED

MARCH-APRIL 1970

PLATE I

DOMINION OF CANADA:

PROVINCE OF BRITISH COLUMBIA.

TO WIT:

In the Matter of a geophysical survey on behalf of Copper Range Exploration Co. Inc.

I, J. L. McCrea for Seigel Associates Limited

of 750 - 890 West Pender Street, Vancouver

in the Province of British Columbia, do solemnly declare that an aeromagnetic survey has been executed on WINDFALL, IRA, RA, IR, SC, ML, PRES, SK AND SKF claims Tulameen area, British Columbia between March 21 to March 25, 1970. The following expenses were incurred:

(1)	Wages:			
	C. Mohagen	4 days @ $37.50/day	$150.00	
	D. Phillips	4 days @ $37.50/day	150.00	$300.00
(2)	Transportation & shipping to the job			215.67
(3)	Transportation on the job (helicopter)			1,645.60
(4)	Food & living expenses			70.40
(5)	Use of geophysical equipment	4 days @ $200.00/day		800.00
(6)	Paid to Seigel Associates Limited to cover geophysicist's supervision, calculating, plotting and fairdrawing data and preparation of final reports. 121 line miles @ $14.28/mile			1,728.80
				$4,760.47

Note: Navigational aids were furnished by the Copper Range Exploration Co. Inc., to assist flight navigation.

And I make this solemn declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath and by virtue of the "Canada Evidence Act."

Declared before me at the City of Vancouver, in the Province of British Columbia, this 12th day of June, 1970, A.D.

J L McCrea

L Gournotte

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

SUB - MINING RECORDER

APR 23 1970

INVOICE

McELHANNEY SURVEYING & ENGINEERING LTD.

Please remit to: X 1200 West Pender St., Vancouver 1, B.C. Phone 683-8521
9507A Scott Rd., North Surrey, B.C. 581-5261
4619 Lazelle Ave., Terrace, B.C. 635-7163

In account with:

Copper Range Exploration Co. Inc.,
850 West Hastings Street,
Vancouver, B. C.

Invoice No. **70-003**

Date **21st April 1970**

Your Order No.

Our Job No **07139-0**

Attention: Mr. H. Neugebauer

Terms: Net 30 days, thereafter interest at 1% per month

FOR PROFESSIONAL SERVICES IN RESPECT OF:

Cutting of compass baseline with stations at 400' intervals for Aero Magnetic Survey

Final Billing

1. Office Labour		
R. Seel, Supervisor, 6 hrs.	$ 35.40	
F. Egvari, Draftsman, 1 hr.	3.13	
W. Kent, Plotter, 16 hrs.	58.08	
M. Rogers, Legal Plans, ¼ hr.	2.35	
	98.96	
Plus 100%	98.96	$ 197.92
2. Field Labour		
W. Kent, Instrumentman, 200 hrs.	726.00	
Plus 100%	726.00	1,452.00
A. Perrin, Chainman, 152 hrs.	398.24	
C. Vanderhorst, Chainman, 152 hrs.	439.28	
	837.52	
Plus 50%	418.76	1,256.28
3. Expenses		
Vehicle Rental	312.00	
Equipment Rental (Ski-Doo)	558.73	
Equipment Rental (Power Saw)	70.00	
Expendable Field Supplies	126.05	
Gas & Oil	54.92	
Government Fees - L.R.O.	17.00	
Hotels	188.60	
Meals	319.16	
Maps, Plans and Reproductions	14.70	
Telephone and Telegraph	1.90	
Transportation	12.10	
Mileage Allowance	18.00	
Equipment left on Job Site	167.50	
	1,860.66	
Plus 10%	186.07	2,046.73
		$ 4,952.93

APPROVED FOR PAYMENT

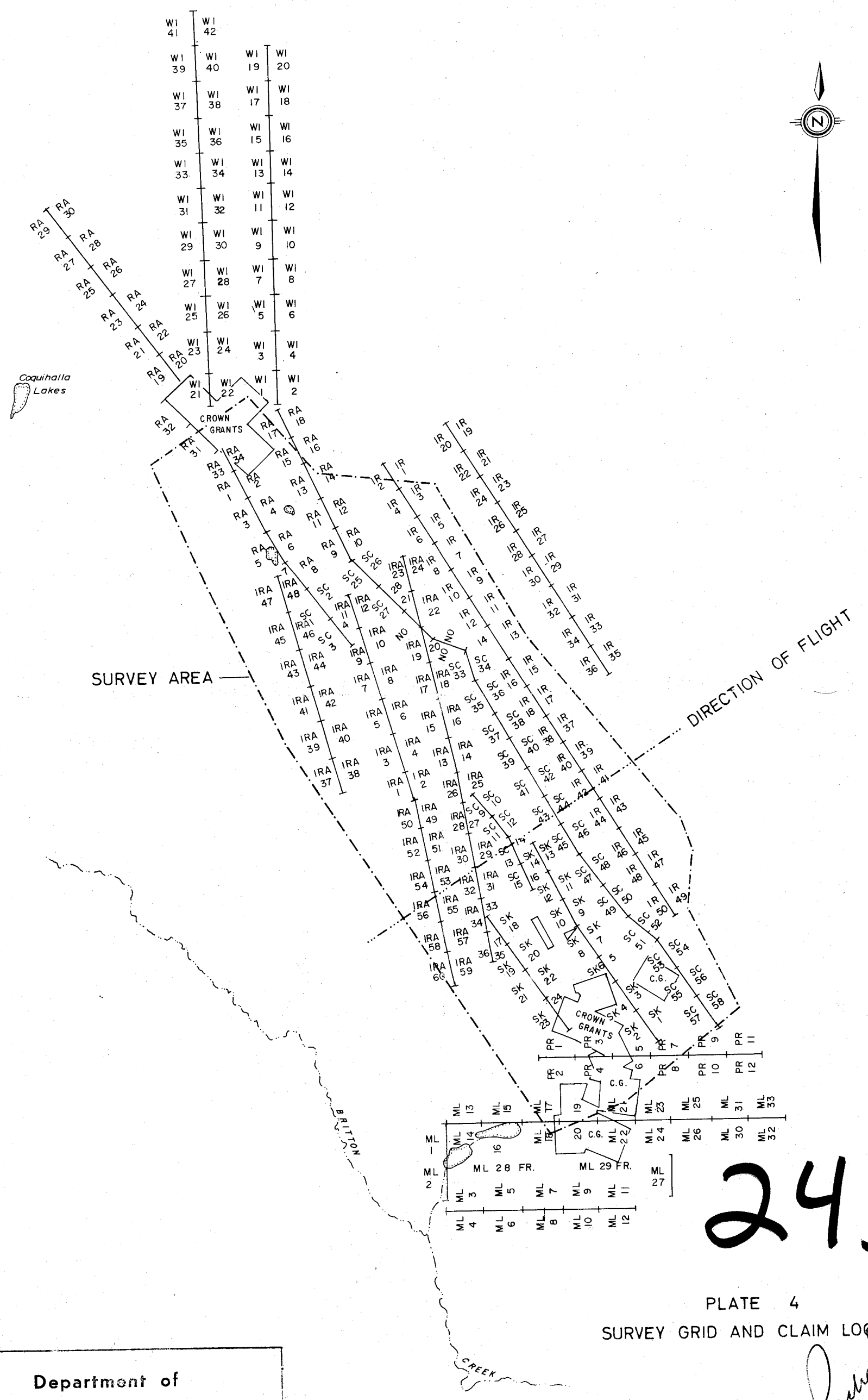


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PLATE 4

SURVEY GRID AND CLAIM LOCATION

Richard Crosby

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 2434 MAP #6

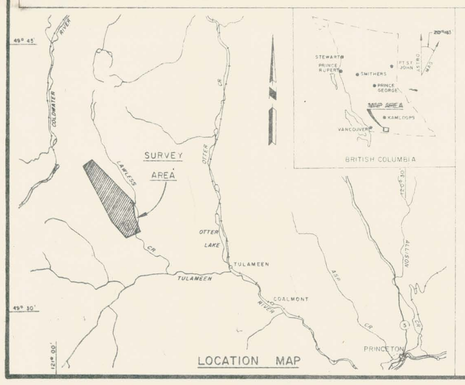
COPPER RANGE EXPLORATION COMPANY, INC.

IRISH BRITCO CLAIMS

TULAMEEN B.C.

SCALE: 1:50,000

2434



LEGEND

L35 1829	FLIGHT LINE, FLIGHT LINE NUMBER AND NUMBERED FIDUCIAL POINT
	500 GAMMA ISOMAGNETIC CONTOUR INTERVAL
	100 GAMMA ISOMAGNETIC CONTOUR INTERVAL
	20 GAMMA ISOMAGNETIC CONTOUR INTERVAL
	MAGNETIC LOW
	BASE VALUE ARBITRARY
	ROADS
	DRAINAGE
×	KNOWN ELEVATION
△	UNKNOWN ELEVATION
	CO ORDINATES
	500 FOOT CONTOUR INTERVAL
	50 FOOT CONTOUR INTERVAL

SHEET INDEX MAP

PLATE 2

COPPER RANGE EXPLORATION COMPANY INC.

IRISH-BRITCO PROPERTY, TULAMEEN AREA, B.C.

AIRBORNE MAGNETOMETER SURVEY

NPM-1

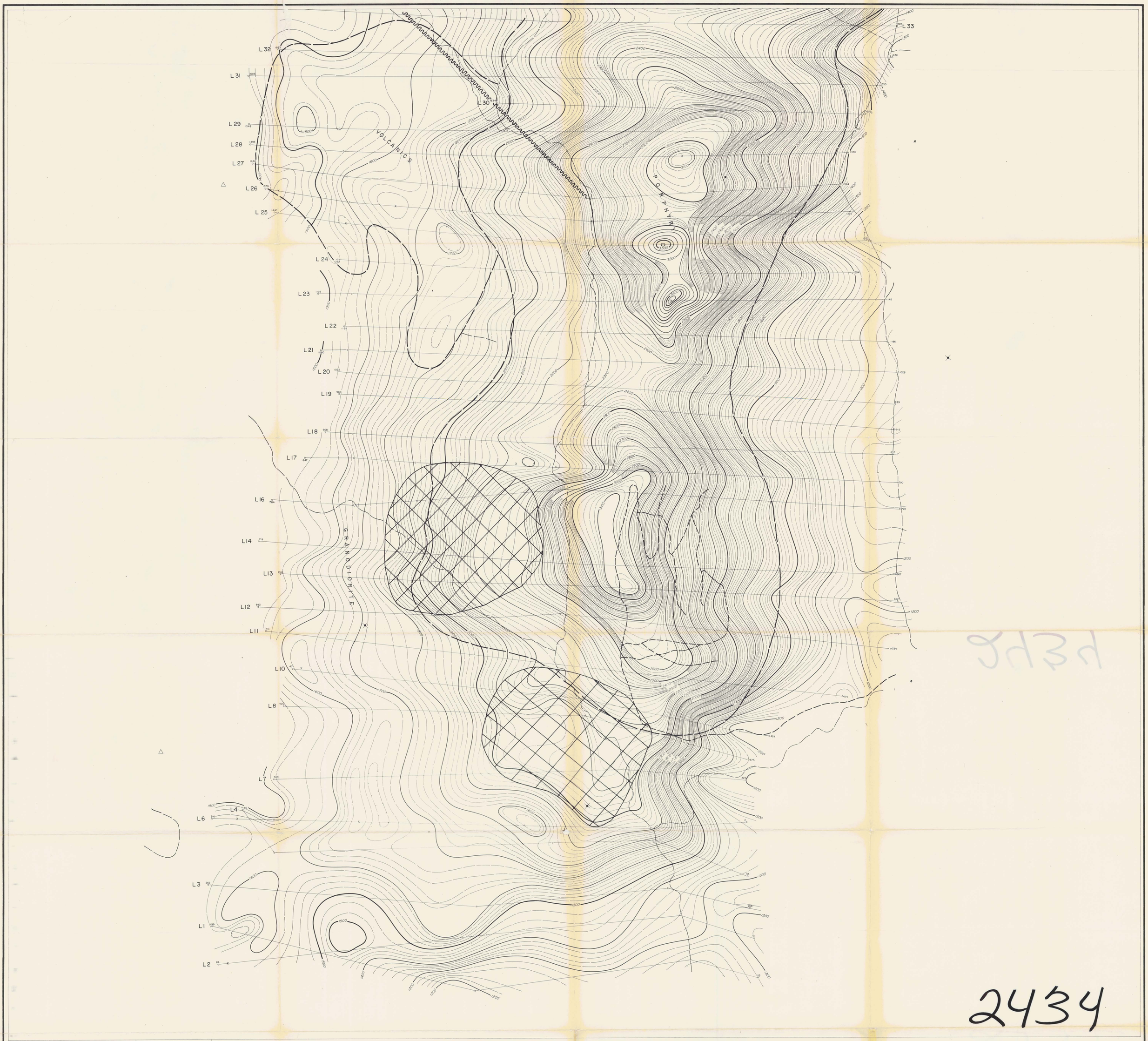
FLIGHTLINES, TOPOGRAPHIC CONTOURS
AND MAGNETOMETER CONTOURS

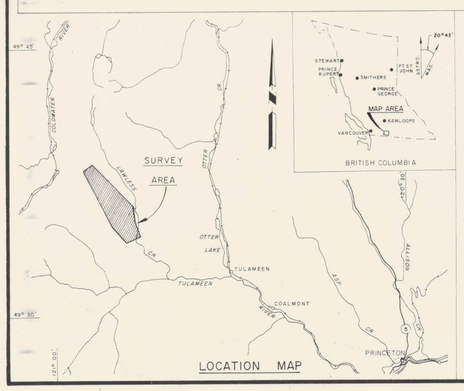
SCALE : 1" = 500'

SURVEY BY SEIGEL ASSOCIATES LIMITED
FLOWN AND COMPILED MARCH-APRIL 1970
AIRCRAFT TERRAIN CLEARANCE 300'
FLIGHT LINE SPACING 500'

500' 0 500' 1000'
SCALE IN FEET

SHEET 2 of 2

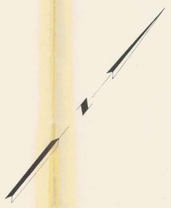




LOCATION MAP

LEGEND

- PROBABLE FAULT
- GEOLOGICAL CONTACT
- POSSIBLE ALTERATION ZONE
- L35 1829 — FLIGHT LINE, FLIGHT LINE NUMBER AND NUMBERED FIDUCIAL POINT
- 500 GAMMA ISOMAGNETIC CONTOUR INTERVAL
- 100 GAMMA ISOMAGNETIC CONTOUR INTERVAL
- 20 GAMMA ISOMAGNETIC CONTOUR INTERVAL
- MAGNETIC LOW
- BASE VALUE ARBITRARY
- ROADS
- DRAINAGE
- x KNOWN ELEVATION
- △ UNKNOWN ELEVATION
- COORDINATES



SHEET INDEX MAP

2434

PLATE 3

COPPER RANGE EXPLORATION COMPANY INC.

IRISH-BRITCO PROPERTY, TULAMEEN AREA, B.C.

AIRBORNE MAGNETOMETER SURVEY

NPM-1

MAGNETOMETER CONTOURS & GEOPHYSICAL INTERPRETATION

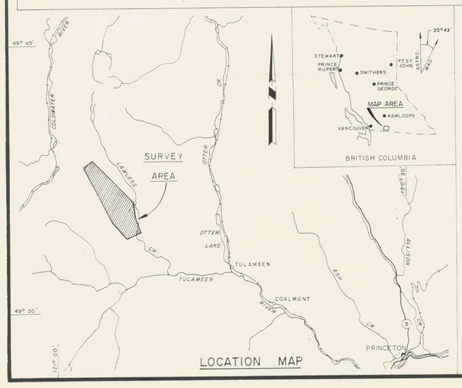
SCALE: 1" = 500

SURVEY BY SEIGEL ASSOCIATES LIMITED
FLOWN AND COMPILED MARCH-APRIL 1970
AIRCRAFT TERRAIN CLEARANCE 300'
FLIGHT LINE SPACING 500'

500' 0 500' 1000'
SCALE IN FEET

Richard Chasky

SHEET 2 of 2



LOCATION MAP

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- BASE VALUE ARBITRARY
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- x KNOWN ELEVATION
- △ UNKNOWN ELEVATION
- ✦ COORDINATES

SHEET INDEX MAP

2434

PLATE 3

COPPER RANGE EXPLORATION COMPANY INC.

IRISH-BRITCO PROPERTY, TULAMEEN AREA, B.C.

AIRBORNE MAGNETOMETER SURVEY

NPM-1

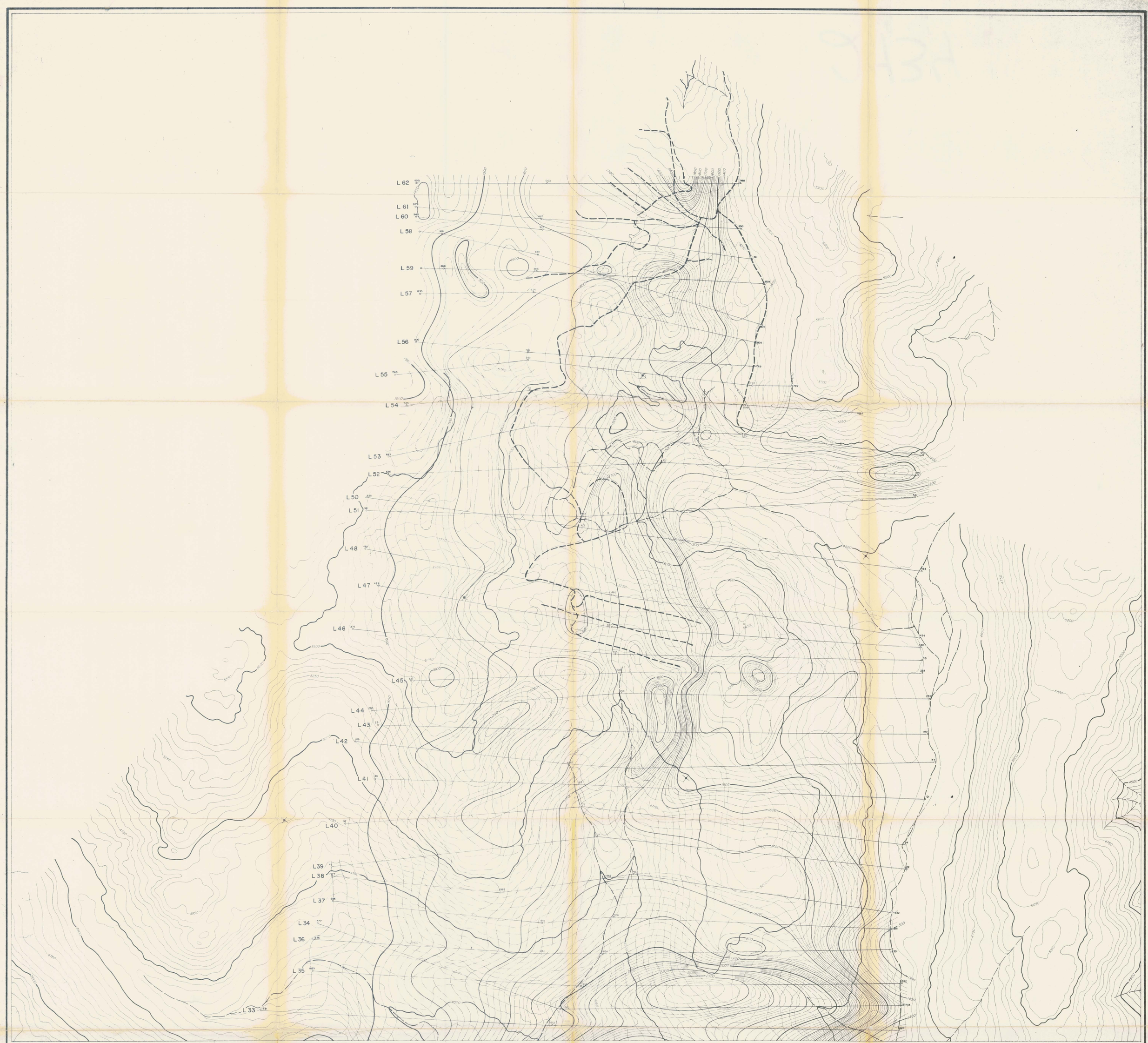
MAGNETOMETER CONTOURS & GEOPHYSICAL INTERPRETATION

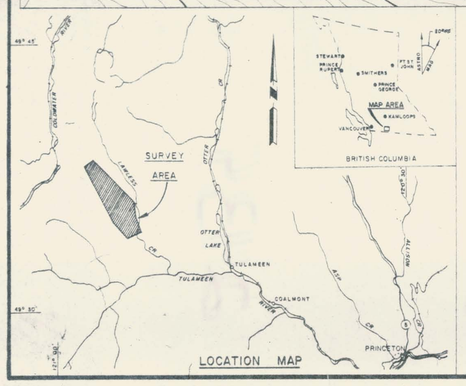
SCALE: 1" = 500

SURVEY BY SEIGEL ASSOCIATES LIMITED
FLOWN AND COMPILED MARCH-APRIL 1970
AIRCRAFT TERRAIN CLEARANCE 300'
FLIGHT LINE SPACING 500'

500' 0 500' 1000'
SCALE IN FEET

SHEET 1 of 2





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- COORDINATES
- 500 FOOT CONTOUR INTERVAL
- 50 FOOT CONTOUR INTERVAL

SHEET INDEX MAP

2434

PLATE 2

COPPER RANGE EXPLORATION COMPANY INC.

IRISH-BRITCO PROPERTY, TULAMEEN AREA, B.C.

AIRBORNE MAGNETOMETER SURVEY

NPM-1

FLIGHTLINES, TOPOGRAPHIC CONTOURS
AND MAGNETOMETER CONTOURS

SCALE: 1" = 500'

SURVEY BY SEIGEC ASSOCIATES LIMITED
FLOWN AND COMPILED MARCH-APRIL 1970
AIRCRAFT TERRAIN CLEARANCE 300'
FLIGHT LINE SPACING 500'

500' 0 500' 1000'
SCALE IN FEET

Richard Cooley

SHEET 1 of 2