

4082

REPORT ON
AIRBORNE MAGNETOMETER SURVEY
BLUEY CLAIM GROUP
ASPEN GROVE AREA, BRITISH COLUMBIA
ON BEHALF OF
BALFOUR MINES LTD. (N.P.L.)

92H/16W

by

Michael J. Lewis, M.Sc.

August 11, 1972

CLAIMS:

BLUEY 1 - 54 inclusive

LOCATION:

About 7 miles east of Aspen Grove, British Columbia
Nicola Mining Division
49°55'N 120°28'W

DATE:

July 26, 1972

| | |
|-------------------------------|-----|
| Department of | |
| Mines and Petroleum Resources | |
| ASSESSMENT REPORT | |
| NO. 4082 | MAP |

CONTENTS

| | <u>Page No.</u> |
|-----------------------|-----------------|
| INTRODUCTION | 1 |
| PRESENTATION OF DATA | 2 |
| DISCUSSION OF RESULTS | 2 |

FIGURES AND PLATES

| | |
|------------------------------------|--------------------------|
| #1 Figure 1 - Location Map | Scale 1:250,000 |
| #2 Plate 1 - Magnetic Contour Plan | Scale 1 inch = 1320 feet |
| #3 Plate 2 - Interpretation | Scale 1 inch = 1320 feet |



REPORT ON
AIRBORNE MAGNETOMETER SURVEY
BLUEY CLAIM GROUP
ASPEN GROVE AREA, BRITISH COLUMBIA
ON BEHALF OF
BALFOUR MINES LTD. (N.P.L.)

INTRODUCTION

On July 26, 1972, an airborne magnetometer survey was flown in the Aspen Grove area, British Columbia by Seigel Associates Limited on behalf of Balfour Mines Ltd. (N.P.L.). Approximately six square miles of geophysical coverage were attained. Compilation of the data was carried out between July 26th and August 7th, 1972.

As shown on the attached "Location Map" the survey area is centred at about $49^{\circ}55'N$; $120^{\circ}28'W$. The area is located in the Nicola Mining Division about seven miles east of Aspen Grove, British Columbia.

A Scintrex MAP-2 total intensity nuclear resonance magnetometer was utilized on the present survey. This unit was installed, together with a Bonzer radio altimeter, a Vinton Mark III 16 mm positioning camera and a Scintrex IA-2 intervalometer, in a Jet Ranger 206-B helicopter on charter from Okanagan Helicopters. Appendix 'A', attached gives full technical details of the magnetometer and ancillary equipment.

The survey traverses were flown at a nominal line interval of 660 feet along parallel lines oriented east-west. Flight navigation and flight path recovery were based on photomosaics on the scale of 1 inch = 1/4 mile. The magnetometer sensor was flown 100 feet below the helicopter - the mean terrain clearance was 400 feet.

The purpose of the present survey was to investigate the magnetic properties of the geological formations within the survey area. Disturbances in the magnetic field reflect varying distributions of magnetic material



in the underlying rocks. From a study of these variations various rock types and/or structural features may be revealed.

The Total Magnetic Field within the survey area is approximately 58,000 gammas; the Inclination of the Field is about 70° .

PRESENTATION OF DATA

The results of the survey are presented in contour form on Plate 2 on the scale of 1 inch = 1/4 mile. Flight lines along with pertinent topographic features are shown on this Plate. The contour interval is 20 gammas.

The original magnetic data together with altimeter and fiducial recordings are shown on analogue recorder traces. The magnetometer scale is 1 inch = 100 gammas with automatic steps of 1000 gammas. The horizontal scale is about 1 inch = 1320 feet.

DISCUSSION OF RESULTS

The results of the survey are shown in contour form on Plate 1. Superimposed on these results and contained on an original transparent sheet (Plate 2) is a general broad interpretation of the data. Geological features (faults, geological contacts, intrusions, etc.) have been broadly delineated.

The magnetism of most rocks is controlled by their content of ferro-magnetic minerals (magnetite, pyrrhotite, ilmenite, etc.). Basic igneous rocks (basalts, diabases, etc.) as well as scarn and some granulites are generally much more magnetic than acid igneous rocks (granites, rhyolites, etc.), limestones, sandstones and slates. In the present area bands of magnetic disturbance or relatively high magnetic amplitude are presumed to reflect Basic Volcanic Formations; regions of low relief are presumed to reflect "Acidic" rocks. The former, designated V_1 , V_2 , etc. on the



interpretation sheet, are characterized by high amplitudes, steep gradients and, in some instances, sharp variations over short distances. The latter, designated A₁, A₂, etc., constitute the background magnetically inactive areas and may reflect acid volcanics, sediments, granitic intrusives, etc.

Prominent lineaments (faults, shear zones, etc.) are also indicated on the superimposed interpretation.

Briefly the survey property is divisible into the following characteristic regions on the basis of magnetic amplitude and contour configuration.

- (1) A series of folded "bedded" horizons designated A₁, V₁, A₂, A₃ and A₆. Fold axes trend about NE-SW, strikes vary from about N-S to about E-W (note the very prominent bend of Zone V₁ on Line 9).

V₁ is a conspicuous band of moderate amplitude (200-300 gammas above background). It is folded convex NW and probably reflects a "Basic Volcanic" formation 1000 feet to 3000 feet wide.

A₁ is a region of low relief lying grid west of V₁. Though inadequately defined by the present coverage, it may represent sedimentary or "acidic" rocks.

A₂ is a second prominent band, 1000 feet to 3000 feet wide, paralleling V₁ on its eastern flank. It consists of a series of noticeable "lows" shaded to emphasize their continuity across the grid. A₂ likely reflects a sedimentary horizon folded in unison with V₁.

A₃, lying east of A₂, is an area of low relief reflecting "acidic" rock formations (sediments, granulites, etc.).



Finally A₆ is presumed to reflect a non-magnetic member of the fold sequence.

As indicated on Plate 2 the folded horizons are dissected and "carved-up" by major lineaments, presumably, fault zones.

- (2) A broad irregular mass of relatively high magnetic amplitude (often in excess of 1800 gammas). This region is designated V₂ on Plate 2 and probably reflects relatively flat lying basic volcanics resting unconformably on the underlying formations (A₂, A₃, etc.).
- (3) An area of low relief designated A₄ on Plate 2 which may represent a granitic intrusion - note its apparently discordant and rounded outline. It is bordered grid north, northwest and east by Formation V₂ (volcanics) and abuts grid south and southwest on to Formation A₃ (sediments). A₄ covers an area of approximately one-half a square mile.

As a follow-up to the present geophysical programme it is recommended that the survey area be mapped geologically in order to identify the sources of the magnetic responses. A more substantial interpretation of the present results would then be possible. In the search for mineral-bearing horizons special attention should be paid to contact zones, to fractures and faults, to fold axes and to the postulated intrusive (A₄).

Additional ground follow-up surveying would be dependent upon the results of the geological field work.

Respectfully submitted,

SEIGEL ASSOCIATES LIMITED

Michael J. Lewis
 Michael J. Lewis, M.Sc.
 Geophysicist

Vancouver, B. C.



APPENDIX 'A'

MAGNETOMETER - MAP-2

The MAP-2 is a lightweight, one gamma airborne proton-precession magnetometer with a range of 20,000 to 100,000 gammas and an automatic five digit visual display. This new instrument has several significant advantages over other instruments of this type besides its compact size and light weight.

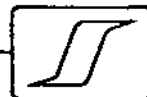
One of its most interesting features is that, unlike other airborne magnetometers which have to be switched manually from one narrow (usually 4000 - 6000 gammas) range to another, the MAP-2 tracks automatically over its full 80,000 gamma range.

This advantage is particularly significant in surveys flown at low terrain clearances in areas of high magnetic relief, conditions which are common in mineral prospecting.

The instrument is of compact modular design (1/2 standard rack size) and has both digital and analogue outputs. The analogue outputs are either 100 or 1000 gammas full scale, with automatic stepping. During each step, an indication of the new stepping level is recorded, providing a permanent reference identifying each step.

The measuring sequence can either be sequentially triggered internally through its own programmer or initiated by a suitable command pulse.

In addition while on internal triggering, the instrument provides an external output command pulse enabling other instrumentation to be synchronized with the magnetometer.



SPECIFICATIONS - MAP-2

Range: 20,000 - 100,000 gammas (world-wide)
continuous range (automatic tracking)

Sensitivity: ± 1 gamma (fully automatic)

Accuracy: ± 1 gamma

Sampling Rate: Automatic standard 1 second, with provision
for external triggering from other equipment
with minimum 1 second intervals.

Readout-Visual: Digital Display by 5 incandescent, 7 bar
display lights

Digital Data Output: BDC 1-2-4-8 DTL, TTL Compatible

Analog Data Output: 5 V full scale for 1000 gammas, 100 gammas;
1 gamma resolution

External Trigger: Requirement: +4 V to 0 transition (as slave)

Tigger Output: +4 V to 0 transition at start of cycle
(as master)

Power Requirements: 24-30V DC, 3.2 A max.

Temperature Range: -30 to +50 degrees C

Dimensions and Weights: Console
8 1/2" X 5 1/4" X 13" (half-rack)
(21 1/2 cm X 13 1/2 cm X 33 cm)
12 lbs. (5.4 kg)

Tow Bird
7" X 23" (18 cm X 58 cm)
20 lbs. (9 kg)



ANCILLARY EQUIPMENT

1. Altimeter

A Bonzer, high frequency solid state radio altimeter 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.

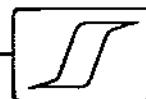
The output of the Bonzer may be expressed in analogue form on a suitable graphic recorder, or may be, for convenience, converted to a semi-digital form on a recorder side pen. In the latter event the altimeter record is a series of spaced pulses whose separation is proportional to the mean terrain clearance.

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.



DOMINION OF CANADA:
PROVINCE OF BRITISH COLUMBIA.

In the Matter of

a geophysical survey on behalf of
Balfour Mining Ltd. (N.P.L.)

To Wit:

I, L. A. Merrifield for Scintrex Surveys Limited (formerly Seigel Associates Limited)

of 750 - 890 West Pender Street, Vancouver,

in the Province of British Columbia, do solemnly declare that an airborne magnetometer survey has been executed on the BLUEY claims in the Aspen Grove area, British Columbia on July 26, 1972. The following expenses were incurred:

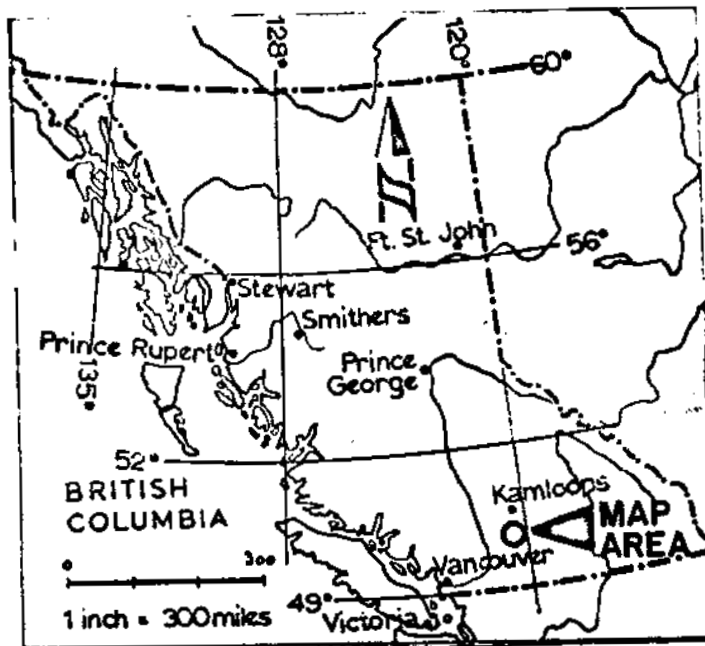
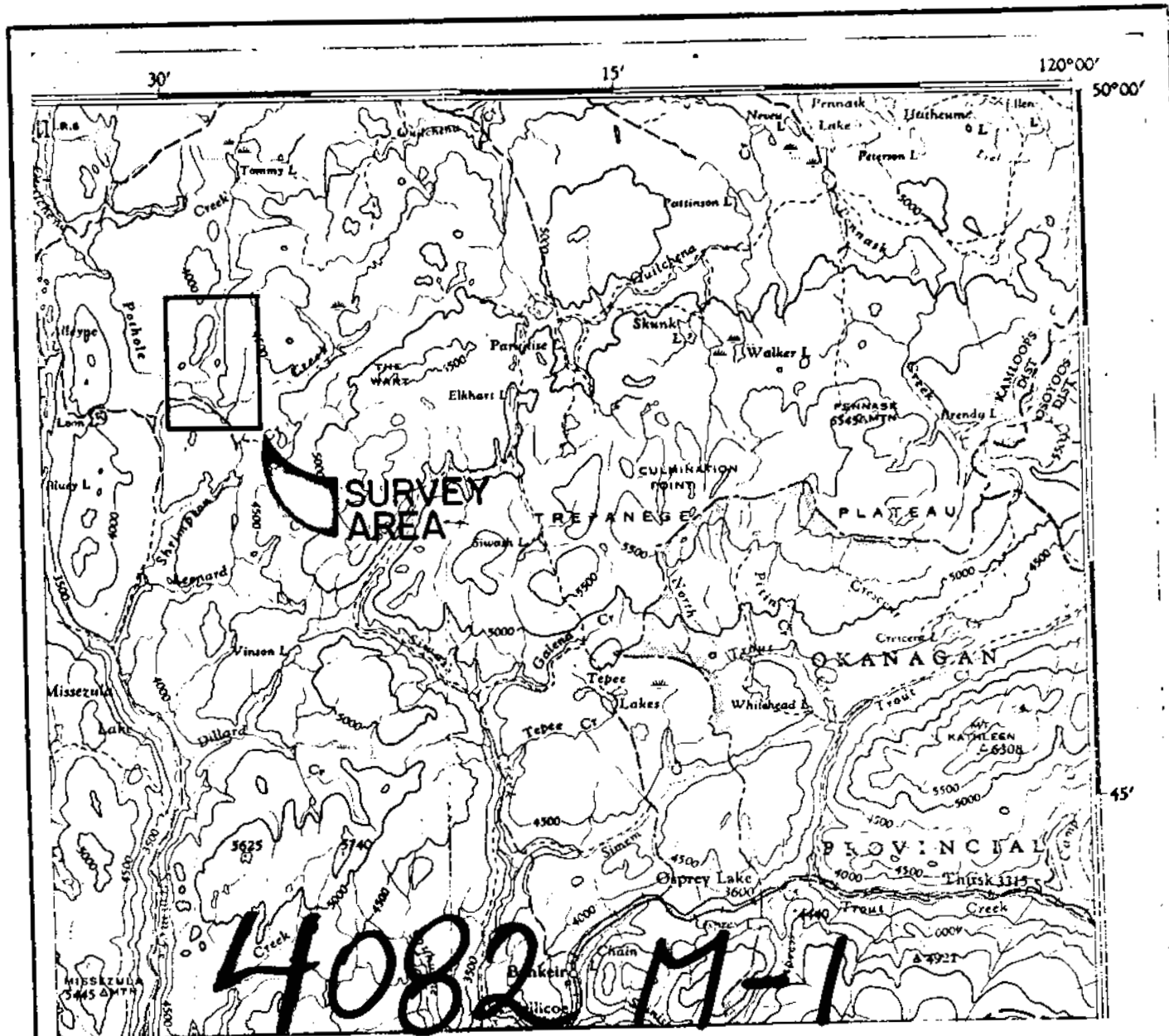
| | | | |
|---|--------------|----------------------|-------------------|
| (1) Wages: | | | |
| | R. Sheldrake | 1 day @ \$85.00/day | \$85.00 |
| | N. Husband | 3 days @ \$85.00/day | <u>\$255.00</u> |
| | | | \$340.00 |
| (2) Transportation & shipping to the job | | | 317.70 |
| (3) Air Photo Mosaics | | | 220.00 |
| (4) Food & living expenses | | | 140.87 |
| (5) Use of geophysical equipment | | | |
| | | 3 days @ \$50.00/day | 150.00 |
| (6) Paid to Scintrex Surveys Limited to cover geophysicist's supervision calculating, plotting and fairdrawing data and preparation of final reports. | | | <u>1,138.31</u> |
| | | | <u>\$2,306.88</u> |

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 6th
day of December, 1972, A.D.

L.A. Merrifield

Julius Lussner
A Commissioner for taking Affidavits for British Columbia or
A Notary Public in and for the Province of British Columbia.
Sub - mining Recorder



BALFOUR MINING LTD. (N.P.L.)

LOCATION MAP
OF
AIRBORNE GEOPHYSICAL SURVEY
ASPEN GROVE AREA, B.C.

SCALE 1 : 250,000
4 miles 0 4 miles

Survey by
SEIGEL ASSOCIATES LIMITED
JULY 1972

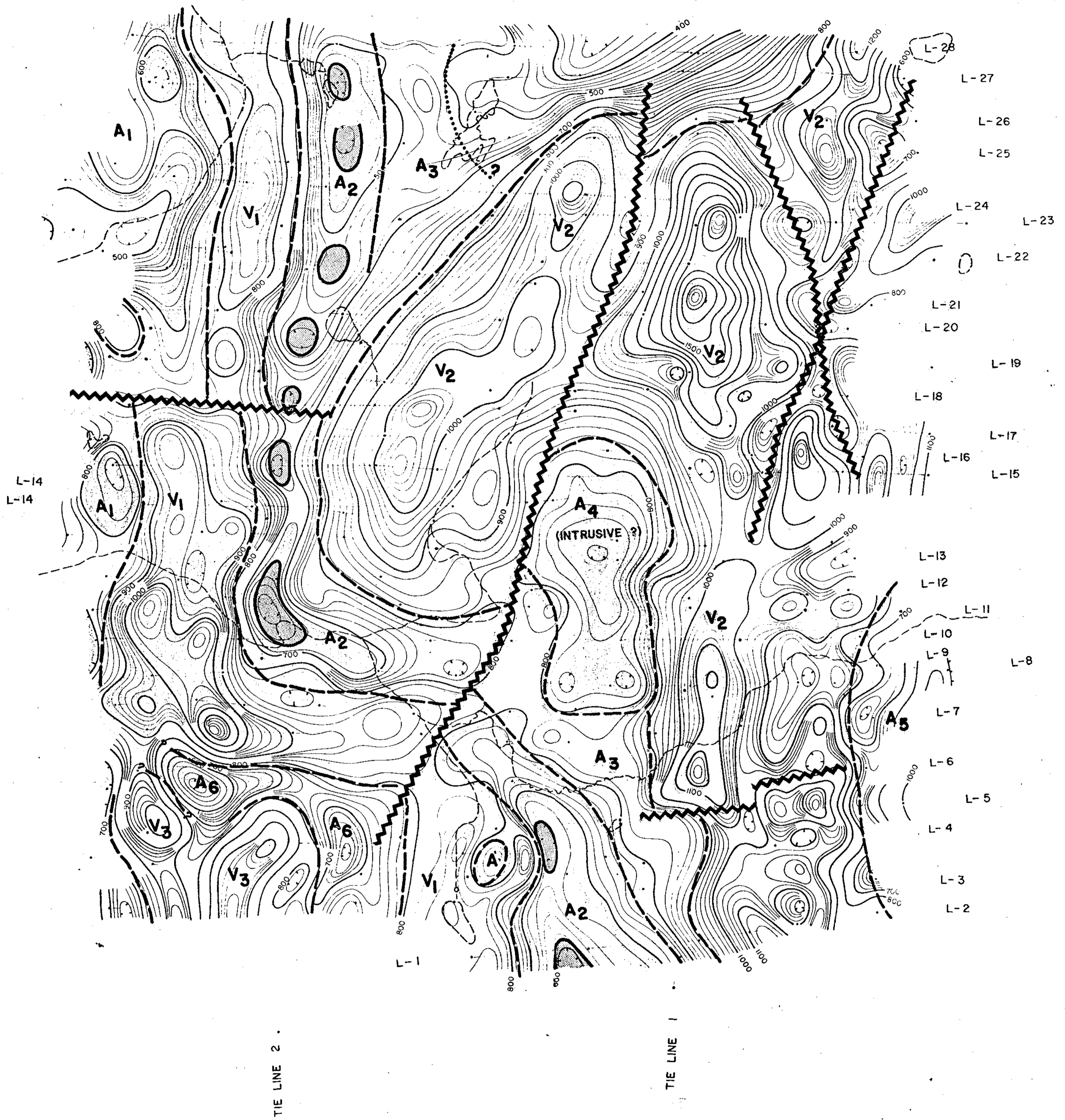
FIG 1



1-M 28071

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NO. 4082 MAP #1



LEGEND

MAGNETOMETER SURVEY

- L-2 — FLIGHT LINE NUMBER, FIGURAL POINT, FLIGHT LINE
- 100 GAMMA ISOMAGNETIC CONTOUR INTERVAL
- 20 GAMMA ISOMAGNETIC CONTOUR INTERVAL
- MAGNETIC LOW

INSTRUMENTATION

- MAP-2 NUCLEAR RESONANCE MAGNETOMETER
- BONZER RADIO ALTIMETER
- HP 7100 B MOSELEY DUAL TRACE RECORDER

- BASE INTENSITY 57000 GAMMA
- SENSOR TERRAIN CLEARANCE 300'
- NOMINAL FLIGHT LINE SPACING 660'

TOPOGRAPHY

- DRAINAGE
- LAKES



PLATE 2

BALFOUR MINING LIMITED (N.P.L.)
ASPEN GROVE AREA, B.C.

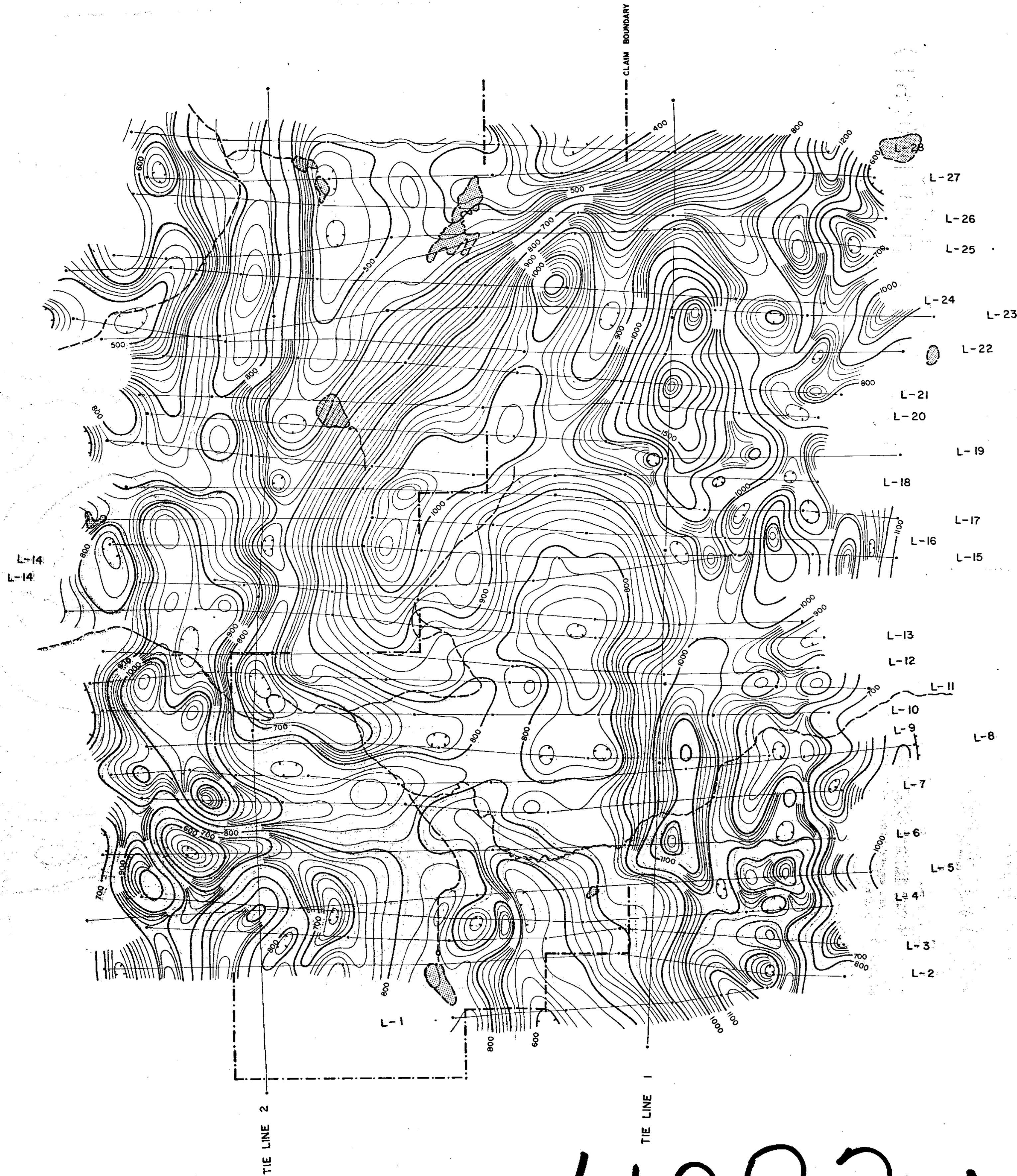
Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4082 MAP #3

MAGNETOMETER CONTOUR PLAN
OF
AIRBORNE GEOPHYSICAL SURVEY

APPROX. SCALE 1:1320
BY
SEIGEL ASSOCIATES LIMITED
VANCOUVER B.C.

[Handwritten Signature]

TO ACCOMPANY A GEOPHYSICAL REPORT BY MICHAEL J. LEWIS WORK COMPLETED 27.7.1972 JOB NUMBER 885 SHEET NUMBER 1 OF 1
DATE: 11 AUGUST 1972 REV DRAFTED: 3.8.1972



4082 M-2

LEGEND

MAGNETOMETER SURVEY

- L-28 — FLIGHT LINE NUMBER, FIDUCIAL POINT, FLIGHT LINE
- 100 GAMMA ISOMAGNETIC CONTOUR INTERVAL
- 20 GAMMA ISOMAGNETIC CONTOUR INTERVAL
- MAGNETIC LOW

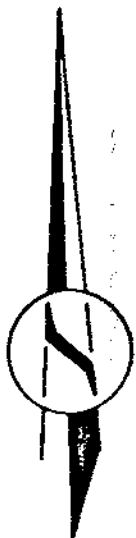
INSTRUMENTATION

- MAP-2 NUCLEAR RESONANCE MAGNETOMETER
- SONZER RADIO ALTIMETER
- HP 7100 B - MOSELEY DUAL TRACE RECORDER

BASE INTENSITY 57,000 GAMMA
 SENSOR TERRAIN CLEARANCE 300'
 NOMINAL FLIGHT LINE SPACING 860'

TOPOGRAPHY

- DRAINAGE
- LAKES



| | | | |
|--|--|---|---------------------------|
| <p>PLATE I</p> <p>BALFOUR MINING LIMITED (N.P.L.)</p> <p>ASPEN GROVE AREA, B.C.</p> | | | |
| | | <p>Department of Mines and Petroleum Resources</p> | |
| <p>ASSESSMENT REPORT</p> | | | |
| | | <p>NO. 4082 MAP #2</p> | |
| <p>MAGNETOMETER CONTOUR PLAN</p> <p>OF</p> <p>AIRBORNE GEOPHYSICAL SURVEY</p> | | | |
| <p>APPROX. SCALE 1" = 1320'</p> | | | |
| <p>BY SEIGEL ASSOCIATES LIMITED VANCOUVER B.C.</p> | | | |
| <p>TO ACCOMPANY A GEOPHYSICAL REPORT BY MICHAEL J. LEWIS</p> | | <p>WORK COMPLETED: 27.7.1972 DRAFTED: 3.8.1972 REV.</p> | <p>JOB NUMBER 885</p> |
| <p>DATED: 11. AUGUST 1972</p> | | <p>SHEET NUMBER 1 OF 1</p> | |