'80-#297-#

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'80-#2977-# 8071

AIRBORNE MAGNETOMETER SURVEY

ON THE

ELLEN CLAIMS 1 - 4

SKEENA MINING DIVISION

N.T.S.	103 B 12 - E
LATITUDE:	52^{0} 39' 30" N
LONGITUDE:	131^{0} 41' 30" W

FOR:

R. C. O'BRIEN

AND

MOUNTAINEER MINES LTD.

BY:

R. W. WOOLVERTON, P. ENG.

EVERGREEN EXPLORATIONS LTD.

JUNE 20, 1980 VANCOUVER, B.C.

FIELD WORK DONE: DECEMBER 15, 1979.

AIRBORNE MAGNETOMETER SURVEY

ON THE

ELLEN CLAIMS 1 - 4

INTRODUCTION

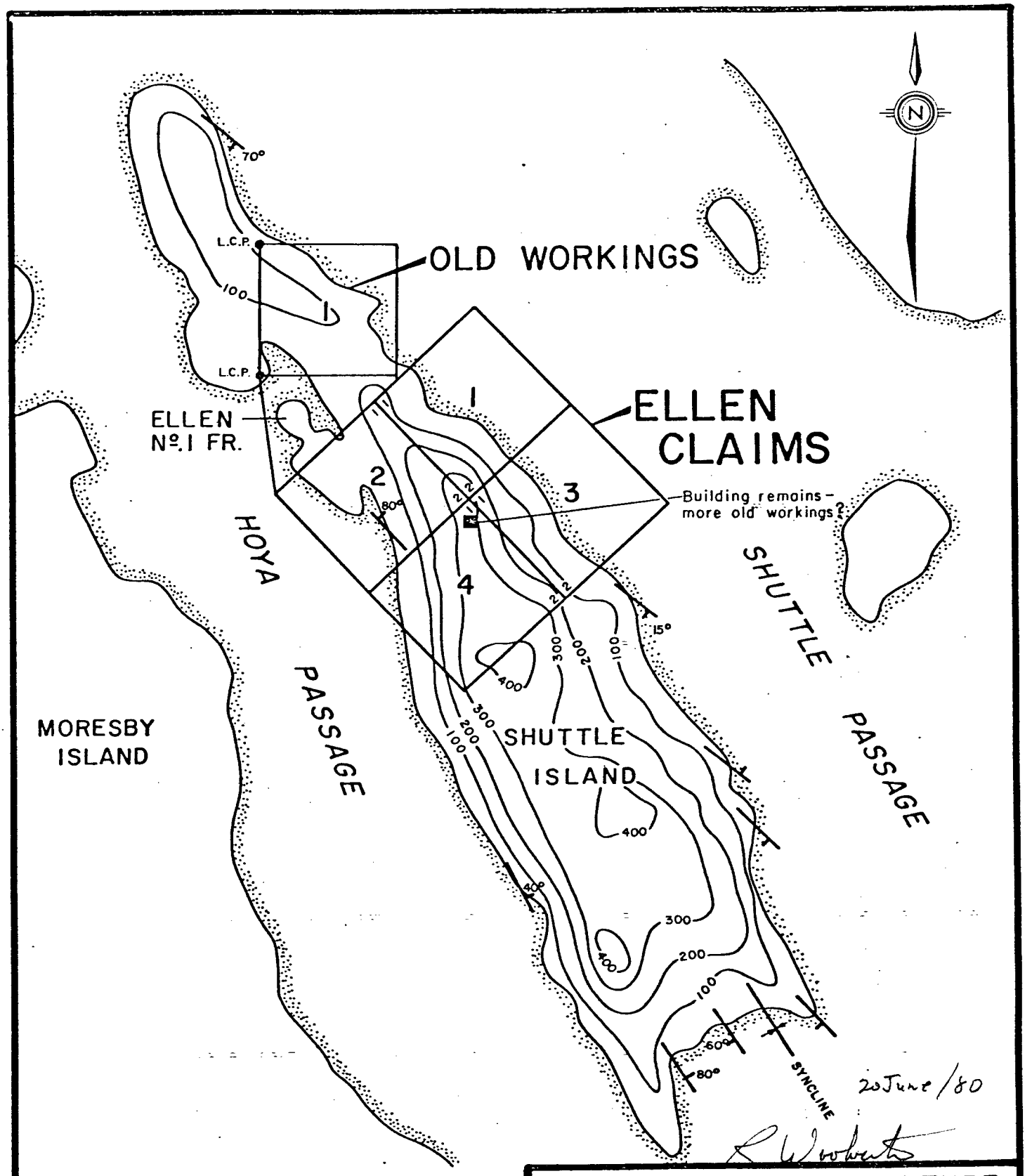
General

The ELLEN CLAIMS cover the north central part of Shuttle Island which is approximately 30 kilometres south and a bit east of Sandspit, Queen Charlotte Islands, British Columbia. Shuttle Island is in Darwin Sound between Lyell Island and Moresby Island. The claims can be reached by a long boat ride from Moresby Camp, on the road at the west end of Cumshewa Inlet, via the many inland waterways among the numerous islands along the east coast of Moresby Island. Alternately, there are amphibious Beavers or helicopters available at the Sandspit airport.

Shuttle Island is only a little over 3 kilometres long and up to 1 kilometre wide. The northern third of the island is relatively low lying and heavily forested, in contrast to the southern two thirds of the island which has about 400 feet of relief and relatively poor timber. Airplane (Sitka) spruce was logged here (Dalzell, p 213) during the First World War and the resulting second growth matured several decades ago. During World War I, a gold vein was discovered near the logging camp. It was subsequently high graded by the owners in the early twenties.

1979 Program

Shuttle Island is underlain by Karmutsen greenstones (Sutherland Brown, p 44) including a green tuff-like sequence with intercalated limestone



BEDDING INCLINATION after ASB Bulletin 54

Topographic contour interval = 100'

FIGURE 1

CHARLOTTE JOINT VENTURE

ELLEN CLAIMS

SHUTTLE ISLAND Q.C.I.
SKEENA M.D.

LOCATION MAP

by R. WOOLVERTON P.Eng r.w.r. APR, 1980

0 500 1000
1:20,000

NTS. 103-B-12E

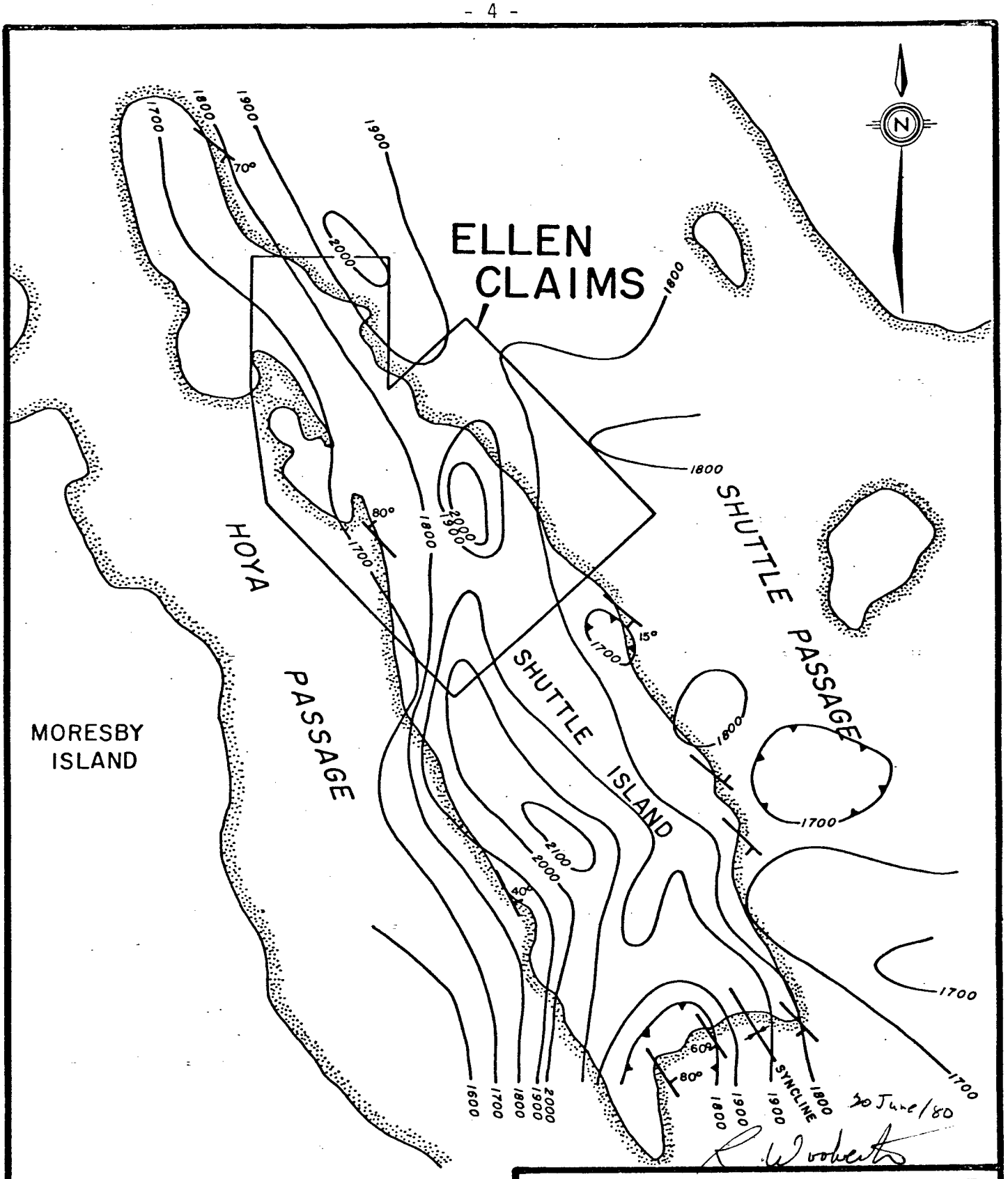
that hosts the known gold veins. Since this unit should be less magnetic than the greenstone unit, an aeromagnetic survey was chosen as a first step in sorting out the geology.

A total field proton magnetometer was mounted in a Queen Charlotte Helicopter's Hughes 500-D. Equipment specifications and surveying details are included in the Appendix to this report. East-west survey lines were flown about 250 metres apart with the "bird" just above the trees. Thirty-six line miles of surveying was completed. The magnetometer readings were plotted on enlarged and filtered copies of government 1:50,000 topographic maps. The data was contoured at 100 gamma intervals and the resulting maps were reduced to 1:20,000 for convenient correlation with the latest 1:20,000 government air photos available for the area. Copies of the aeromagnetic maps are included in a pocket at the back of this report. In addition, Figures 1 and 2 show the topographic relief and magnetic relief in relation to the stratigraphic attitudes mapped by Sutherland Brown. These figures show the location of the ELLEN CLAIMS.

SURVEY RESULTS

As previously mentioned, Sutherland Brown mapped Shuttle Island in the early sixties as part of the B. C. Department of Mines work for Bulletin 54. To aid interpretation of the airmag data, the attitudes he observed in the Karmutsen sequence have been transposed from the Bulletin 54 Map to Figures 1 and 2 of this report. In general, Sutherland Brown's work on Shuttle Island revealed considerable folding with a consistent north-westerly strike. Some of the folding must be quite intense since the syncline at the south end of the island is overturned.

The most obvious magnetic feature is the string of three mag highs that starts at the southwest end of Shuttle and ends immediately off-shore from the old showings, on the northeast side of the Island.



BEDDING INCLINATION after ASB Bulletin 54

Magnetic intensity in gammas plus 55,000 equals actural intensity.

FIGURE 2

CHARLOTTE JOINT VENTURE

ELLEN CLAIMS

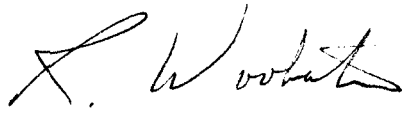
SHUTTLE ISLAND Q.C.I.
SKEENA M.D.
AIRBORNE
MAGNETOMETER SURVEY
by R. WOOLVERTON P.Eng. r.w.r. APR., 1980

0 500 1000
1:20,000

NTS 103-B-12E

Significantly, it obliquely cross-cuts the observed consistent northwest strike of the bedding. If this string of mag highs reflects a more or less continuous geologic feature, it's most likely a dyke or string of small intrusives. A less likely explanation is that it's a more magnetic bed within a folded Karmutsen sequence and that there is some cross-folding which was not observed during the mapping. Interestingly, there is an apparent correlation between the largest mag high and the topo ridge on the southern half of the island. The erosionally resistant rock underlying the topo ridge could be the proposed intrusive as well as Karmutsen strata that have been thermally metamorphosed during intrusion.

Respectfully submitted,



R. W. Woolverton, P. Eng.
EVERGREEN EXPLORATIONS LTD.

June 20, 1980.

REFERENCES

Dalzell, K. E. (1973): The Queen Charlotte Islands, Book 2, page 213.

Sutherland Brown, A (1969): B. C. Department of Mines, Bulletin 54, page 44.

Sutherland Brown, A (1969): B. C. Department of Mines, Bulletin 54, Geology Map

APPENDIX I

STATEMENT OF QUALIFICATIONS

STATEMENT OF QUALIFICATIONS

I, ROY W. WOOLVERTON, Geologist, of 5424 Halifax Street, Burnaby, British Columbia, do hereby certify that:

1) I am a 1960 BSc graduate of the University of British Columbia.

2) I have been a Registered Professional Engineer of the Province of British Columbia since 1969.

3) I have worked as a mineral explorationist since graduation.

4) I personally conducted the airborne survey of the ELLEN CLAIMS and supervised the drafting of the data.

R. Woolverton

ROY W. WOOLVERTON, P. ENG.

20 June 1980

DATE

APPENDIX II

AIRBORNE SURVEY TECHNIQUES

Evergreen Explorations Ltd.

CONTRACT EXPLORATION

R. WOOLVERTON
GEOLOGIST, P.ENG.

• R. C. O'BRIEN
FIELD SUPERVISOR

• 5424 HALIFAX ST., BURNABY 2, B.C., CANADA, PHONE - 299-6998

AIRBORNE SURVEY TECHNIQUES

Evergreen Explorations Ltd.'s airborne geophysical system can be mounted in any helicopter that has two forward seats next to the pilot and sufficient space ahead of them for the geophysical instrument console. A Hughes 500-D is preferred. A fifty foot cable connects the instrument to a "bird" which is towed under the aircraft. The torpedo-shaped bird is approximately five feet long, eight inches in diameter, with four tail fins mounted inside a 12 inch diameter tail section. The bird weighs approximately 50 lbs and, except for an orange nose, is painted with a lampblack lacquer mixture to reduce static build-up.

The magnetometer is connected to a Bausch and Lomb V.O.M. -5 chart recorder which is normally operated at a chart speed of 5 inches per minute. The recorder is placed on the seat between the pilot and the operator so that the ground control fiducial points and other information can be written on the chart during flight.

Ground control for an airborne survey is achieved by using "flight strips" which are air photo strip-mosaics constructed with topographic map control so that straight lines on the flight strips are approximately straight lines on the ground. This isn't always achieved, of course, due to distortion in the photos, and more often, scale variations produced by topographic relief. After the flight lines are plotted on the flight strip mosaic they are flown as exactly as possible by combining a carefully followed aircraft heading with visual corrections where necessary. As the helicopter passes over each swamp, creek, or other recognisable feature (fiducial point), that can be

located on the flight strip, the operator triggers the event marker which simultaneously produces a small mark on the edge of the mag recorder chart. The fiducial points are consecutively numbered on the mag chart during flight and are also plotted on the flight strip. They are later replotted on a base map and become the control points for making a magnetic contour map.

Flight lines rarely cross one another using this technique, since it is a simple matter to break-off when the aircraft has veered too far off line, fly back to the last fiducial point and try again. In flat, featureless areas its often necessary to fly a line several times until it "comes out" where it is supposed to. Even in these extreme cases, experience over the past decade has shown that magnetic features can be located to well within 100 metres.

Survey lines are flown from 200 to 400 metres apart depending upon the detail required. The "bird" is kept as close to the tree tops as possible. In steep mountainous areas, terrain clearance is limited by the climbing ability of the helicopter so that as a general rule the magnetic readings obtained over mountain peaks and ridges are slightly high and those obtained over narrow valleys are correspondingly low.

Periods of magnetic field disturbances due to sunspot activity are avoided by monitoring the forecasts on short wave station WWV, in Boulder, Colorado. Diurnal variations are eliminated by zeroing the magnetometer at altitude immediately after take-off. If this is done at about the same location on each flight, it in effect becomes a base station.

APPENDIX III

SPECIFICATIONS: SABRE AIRBORNE MAGNETOMETER

SPECIFICATIONS: SABRE AIRBORNE MAGNETOMETER

TYPE:	Proton Precession.
RANGE:	20,000 to 75,000 gammas.
REPETITION RATE:	Approximately 1 second.
OUTPUT:	Designed to operate into any potentiometric chart recorder with 0 - 0.1 volt scale.
DISPLAY:	Digital dial + analog meter. Meter shows last 1000, 2000, or 5000 gamma of total field depending on scale selected. Zeroing system allows chart recorder pen to be positioned anywhere on paper so that if pen is centered, the resulting scales that can be selected are ±500, ±1000, and ±2500 gamma. These scales are standard but virtually any other can be provided.
RESOLUTION:	Resolution of instrument itself is better than 1 gamma but ultimate resolution depends on accuracy of chart recorder.
DETECTOR:	Kerosene-filled coil, 9cm x 8cm diameter. Inductance 60 millihenries, resistance 7.5 ohms, weight 2.2 kilograms.
OPERATING TEMPERATURE:	
Instrument:	$-10^{o}C$ to $+60^{o}C$.
Detector:	$-40^{o}C$ to $+60^{o}C$.
DIMENSIONS:	Instrument Console: 30x10x25cm, weight 3.5 kilograms.
POWER SOURCE:	2 - 12 volt - 20 AH lead-acid batteries.

MANUFACTURER: Sabre Electronic Instruments Ltd.,
4245 East Hastings Street,
Burnaby, B. C.

Phone: 291-1617

APPENDIX IV

SUMMARY OF COSTS

SUMMARY OF COSTS

AIRBORNE SURVEY - ELLEN CLAIMS

36 line miles at $35/line mile	$ 1,260.00
Map enlarging and Report Preparation	500.00
TOTAL COST	$ 1,760.00

June 20, 1980.

APPENDIX V

AFFIDAVIT SUPPORTING SUMMARY OF COSTS

AFFIDAVIT SUPPORTING SUMMARY OF COSTS

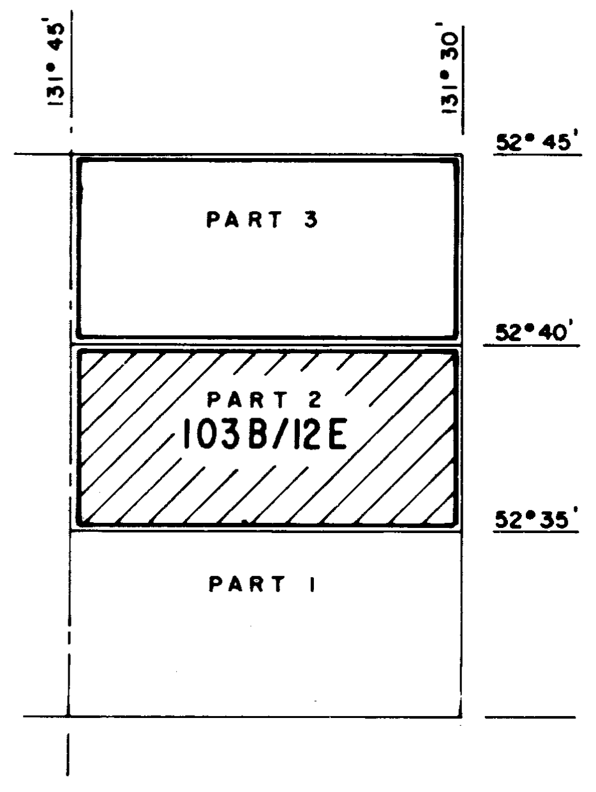
I, ROY W. WOOLVERTON, Geologist, Evergreen Explorations Ltd., of Burnaby, British Columbia, do hereby state, that, to the best of my knowledge and belief the Statement of Costs in this report (AIRBORNE MAGNETOMETER SURVEY ON THE ELLEN CLAIMS 1 - 4) is a true account of expenditures from airborne surveys on the ELLEN property.

R. Woolverton

ROY W. WOOLVERTON

20 June 1980

DATE



KEY MAP

LEGEND

○	FLIGHT LINES WITH IDENTITY POINTS & NUMBERS	▨	LAKE
~	500 GAMMA CONTOURS	○	SWAMP
~	100 GAMMA CONTOURS		
▼	MAGNETIC DEPRESSION		
900	MAGNETIC INTENSITY IN GAMMAS PLUS 55,000 EQUALS ACTUAL INTENSITY		

INSTRUMENT - SABRE MOUNT ELSEC PROTON MAGNETOMETER

MEAN TERRAIN CLEARANCE 60 METERS

ASSESSMENT REPORT
8071 NO.

MOUNTAINEER - AU - 1979 LIMITED PARTNERSHIP
ELLEN CLAIMS

QUEEN CHARLOTTE ISLANDS AREA
SHEET 103B/12E
PART 2
AIRBORNE MAGNETOMETER SURVEY
CONTOUR INTERVAL 100 GAMMAS
SKEENA M.D., B.C.

500 0 500 1000 1500
SCALE IN METERS

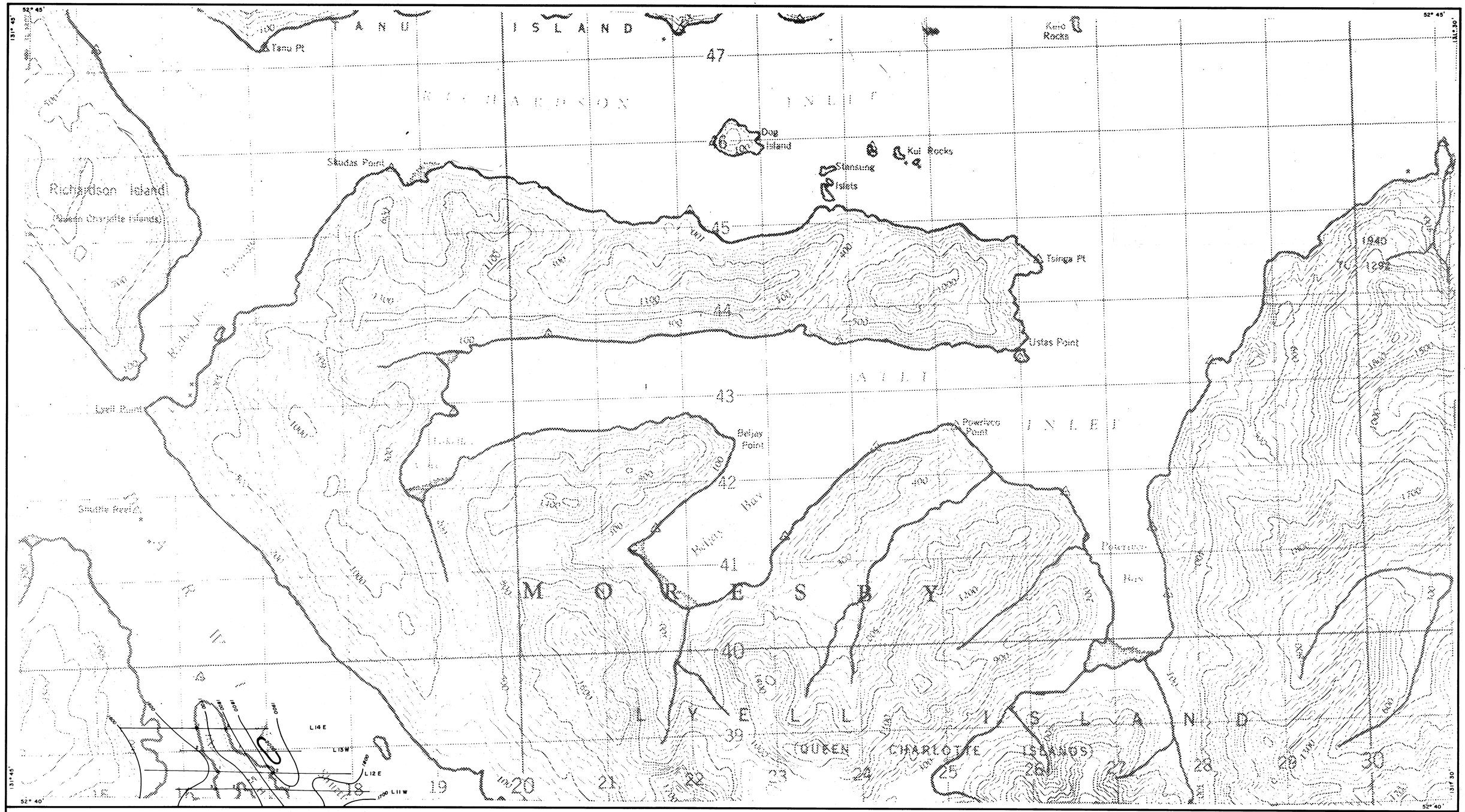
SURVEY BY EVERGREEN EXPLORATIONS LTD.

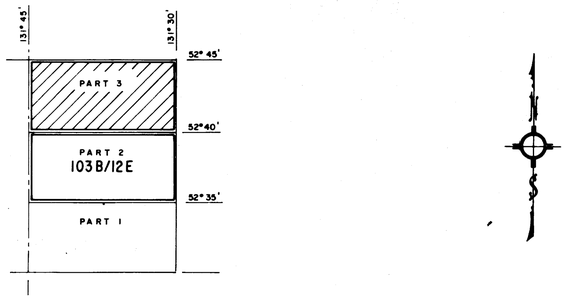
NOVEMBER - DECEMBER 1979

R. Woolverton
20 June/80

PLATE FD-104-1

MAP NO. 1





KEY MAP

LEGEND

- FLIGHT LINES WITH IDENTITY POINTS & NUMBERS
- 500 GAMMA CONTOURS
- 100 GAMMA CONTOURS
- MAGNETIC DEPRESSION
- MAGNETIC INTENSITY IN GAMMAS PLUS 55,000 EQUALS ACTUAL INTENSITY
- LAKE
- SWAMP

INSTRUMENT - SABRE MOUNT ELSEC PROTON MAGNETOMETER

MEAN TERRAIN CLEARANCE 60 METERS

MOUNTAINEER-AU-1979 LIMITED PARTNERSHIP

ELLEN CLAIMS

QUEEN CHARLOTTE ISLANDS AREA

SHEET 103B/12E

PART 3

AIRBORNE MAGNETOMETER SURVEY

CONTOUR INTERVAL 100 GAMMAS

SKEENA M.D., B.C.

500 0 500 1000 1500

SCALE IN METERS

SURVEY BY EVERGREEN EXPLORATIONS LTD.

NOVEMBER-DECEMBER 1979

K. Wootton

20 June/80

PLATE FD-104-2

MAP NO. 2