

LOG NO.	1221	RD
ASSESSMENT REPORT		
FILE NO.		

**ASSESSMENT REPORT**

for the

**LYNDA LOU CLAIM GROUP**

Osoyoos Mining Division, B.C.

NTS 82E/4E

Longitude 119 ° 42' W, Latitude 49 ° 12' N

Prepared for

**LITTLE BEAR RESOURCES LTD.**

Suite 703, 1112 West Pender Street  
Vancouver, B.C. V6E 2S1

by

William J. Radvak, B.A.Sc.

and

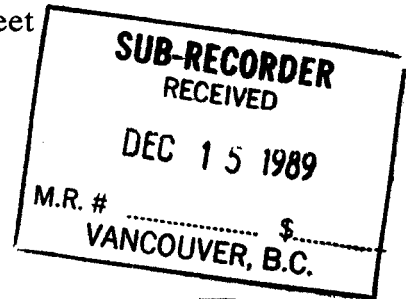
Dylan Watt, B.Sc

of

**Westore Engineering Ltd.**

Suite 703, 1112 West Pender Street  
Vancouver, B.C. V6E 2S1

Submitted - December 15, 1989



**GEOLOGICAL BRANCH  
ASSESSMENT REPORT**  
**19,427**

## TABLE OF CONTENTS

	page
Summary . . . . .	1
Introduction . . . . .	2
Location, Access, Title . . . . .	3
Previous Work . . . . .	5
Regional Geology . . . . .	7
Property Geology and Mineralisation . . . . .	7
Current Program . . . . .	10
Results . . . . .	11
Conclusions and Recommendations . . . . .	12
References . . . . .	13
Certificates . . . . .	14

## LIST OF FIGURES

	Page
Figure 1 General Location Map. . . . .	4
Figure 2 Claim Map . . . . .	6
Figure 3 Regional Geology . . . . .	8
Figure 4 Magnetometer Survey . . . . .	(in pocket)
Figure 5 Property Geology . . . . .	(in pocket)

## LIST OF APPENDICES

Appendix I . . . . .	List of Personnel and Expenditures
----------------------	------------------------------------

## SUMMARY

Assessment work for 1989 on the LYNDA LOU Claim Group consisted of geological mapping and a geophysical survey.

The geophysical program, a magnetometer survey of the complete claim group, was performed to determine the presence of any intrusive/sedimentary contacts. This survey outlined an area of anomalous readings in the southern half of the property, apparently related to a large shear zone. No other anomalies were observed.

The geological mapping did not disclose any new mineralization, however, a new intrusive body was located on the grid. This intrusion is the probable cause of anomalous alteration exposed in old workings in that area of the property. Comparative observations of quartz veins from the LYNDA LOU claims with those at the Morning Star Mine in Fairview Camp indicated that they are most probably of different origin.

## INTRODUCTION

This report provides an evaluation and discussion of results obtained from assessment work conducted during the month of October 1989 on the LYNDA LOU Claim Group located in the Osoyoos Mining Division, B.C. The work was carried out by William J. Radvak, Dylan Watt, and M. Bruce Chernoff of Westore Engineering Ltd.

The work conducted in October 1989 consisted of geological mapping and a geophysical survey of the Claim Group.

A description of the regional geology is included in addition to the evaluation of the property geology and geophysical results.

## LOCATION, ACCESS, TITLE

The LYNDA LOU Claim Group is located in south-central B.C., 4 kilometres north-east of Cawston in the Osoyoos Mining Division on NTS mapsheet 82E/4E and is centred at about 49° 12'N latitude, 119° 42'W (Figure 1). The elevation of the property varies from 670 meters to 1070 meters. The claims cover the base of Blind Creek valley and extend up the south side. Outcrop occurs on steeper slopes and in washes in the southern portion of the property. The northern claims cover mainly cultivated land.

Access to the property is made from Highway #3 at Cawston via the "Fairview Road" which connects Cawston with Oliver. The CRISP and CRISP 2 Initial Post is located 50 meters south of the road, at a point 3.4 kilometres north-east of Cawston.

The LYNDA LOU Claim Group is comprised of 8 two post claims as summarized below:

<u>Claim</u>	<u>Record No.</u>
LYNDA LOU 3	1908
LYNDA LOU 4	1909
CRISP	1910
CRISP 2	1911
WHY	1912
WHY NOT	1913
CECIL 2	1914
CECIL	1915

The LYNDA LOU Claims were recorded on October 17, 1983 and were acquired by Little Bear Resources in 1984.

Location Map

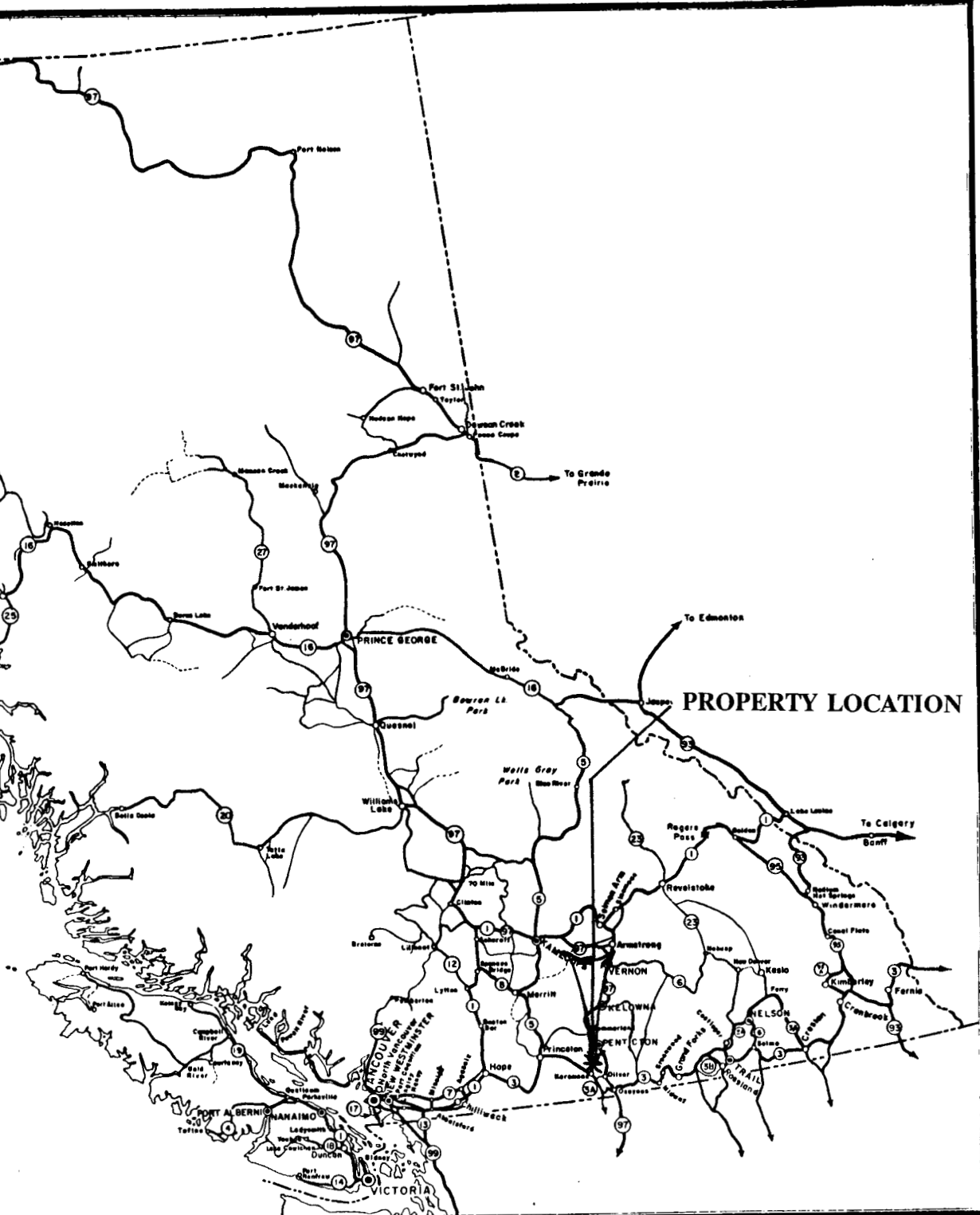
**Lynda Lou Claim Group**  
Osoyoos Mining Division, B.C.

December 8, 1989

Westore Engineering Ltd.



**DOMINION MAP LIMITED**  
541 HOWE ST., VANCOUVER B.C.



## PREVIOUS WORK

The LYNDA LOU Property was staked in 1983 to cover the possible westward extension of mineralized zones in the Fairview Camp, 6 kilometres to the east. The Fairview district was one of the first gold-mining camps in B.C., dating back to the 1890's when considerable ore grading up to 0.35 oz/t. was shipped from the Morning Star and Stemwinder Mines. The Mak Sikkar Camp, another gold district, is located 10 kilometres south of the property. Both of these areas have seen increasing exploration activity in recent years.

No records exist for work done in the Blind Creek valley prior to 1983, but several old workings were located on the claims during the course of Little Bear's exploration. Presumably, these workings date back to the initial stages of exploration and development at the Fairview Camp. In 1984, an exploration program consisting of geochemical and geophysical (VLF - EM) surveys combined with geological mapping was performed on the claim group (Crooker, 1984). This work made up part of an exploration program recommended by R. W. Phendler, P.Eng (1983) in his report to the board of directors of Little Bear. The current program completes Phendler's recommended program.

49° 15' 118° 45'

B2E/4W

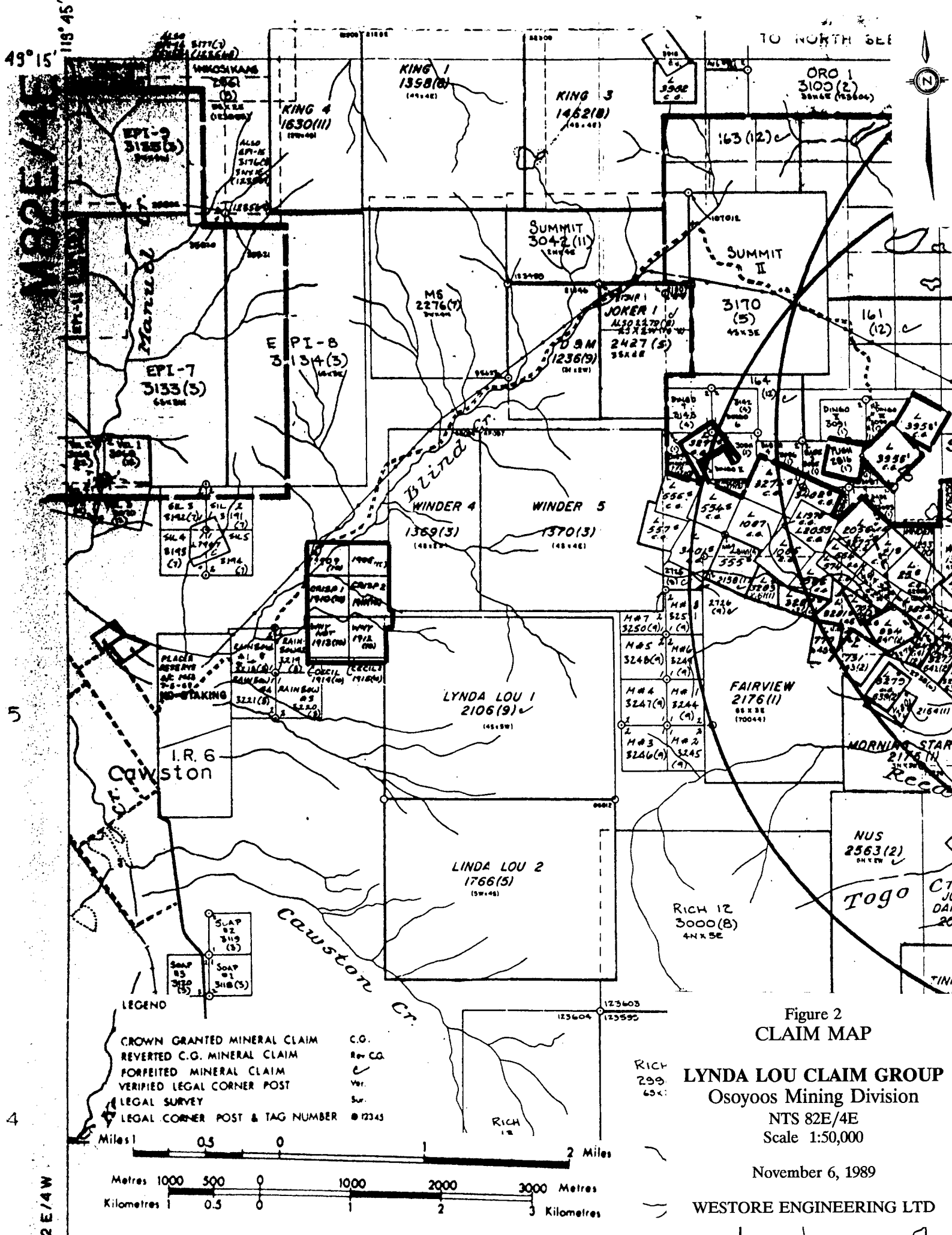


Figure 2  
CLAIM MAP

**LYNDA LOU CLAIM GROUP**  
 Osoyoos Mining Division  
 NTS 82E/4E  
 Scale 1:50,000

November 6, 1989

WESTORE ENGINEERING LTD



## **REGIONAL GEOLOGY**

The LYNDA LOU claims lie within the Intermontane tectonic belt, at the eastern edge of the Coast Mountain Intrusive Belt. The regional geology in this portion of the Similkameen Valley is dominated by the sedimentary - volcanic rocks of the Kobau Group, cut by various intrusive bodies and covered by intermediate Tertiary flows of the Marron Formation.

The age of the Kobau group is uncertain, but has been interpreted to fall between late Devonian and pre-Cretaceous (Mader et al., 1989). The stratigraphy of the Kobau group has recently been studied (*ibid.*) and has been found to include intercalated sediments and mafic volcanic lithologies. Quartzite, phyllite, and minor marble horizons are the results of regional greenschist metamorphism of this package.

The Kobau Group has been intruded by several bodies of Cretaceous intermediate to felsic intrusions - the Oliver Pluton and the Fairview granodiorite being the two main bodies. Minor aplite dykes cut both the intrusions and the Kobau rocks.

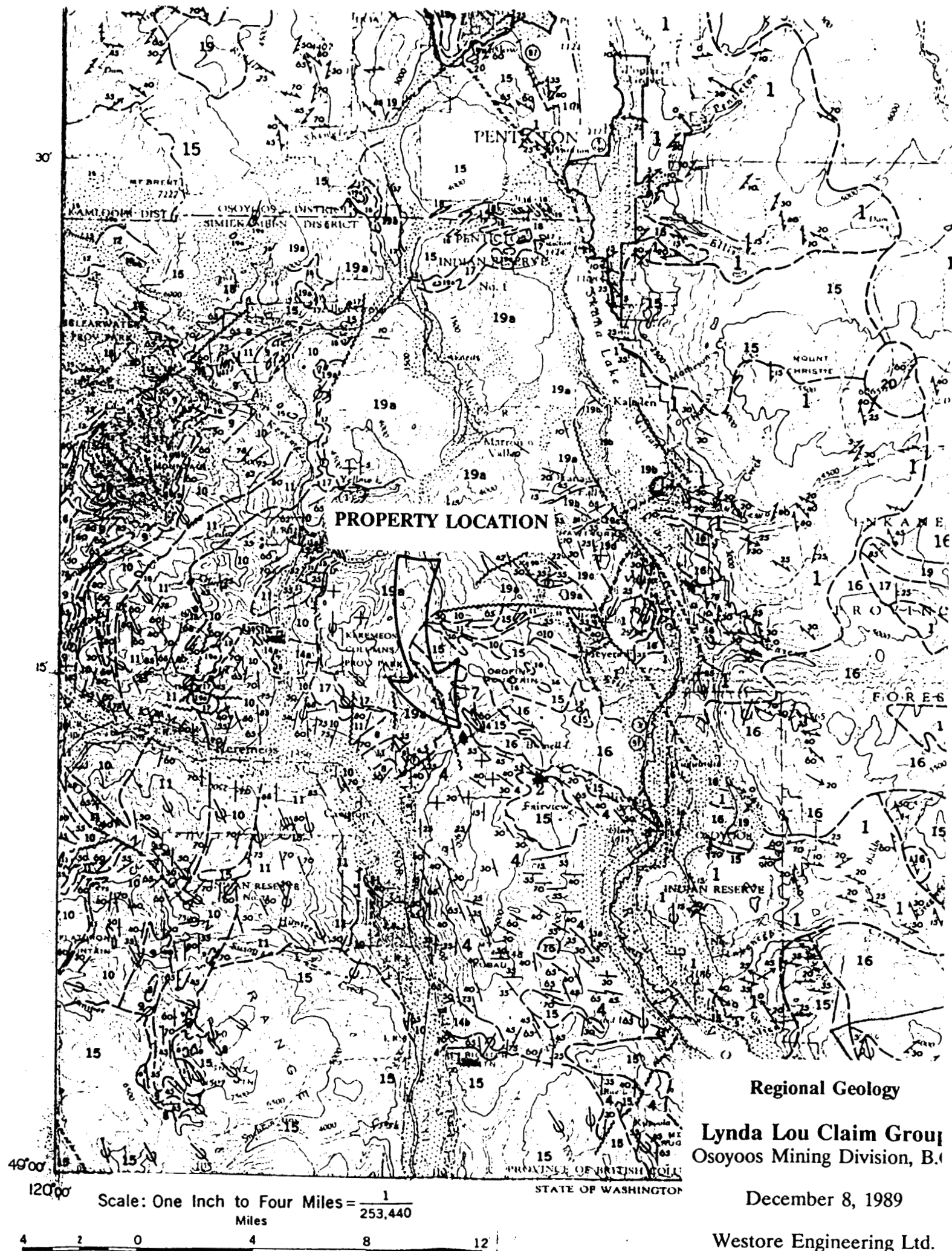
Sulphide-poor, gold-bearing quartz veins occur at the margins of the intrusive bodies and, less often, within the Kobau Group itself. These quartz veins appear to be related to the intrusive activity in the area, and, where they do occur, follow the sedimentary / intrusive contact quite closely. This type of vein was developed extensively at the Fairview Camp, east of the LYNDA LOU claims, and less so at the Mak Sikkar occurrence to the south.

## **PROPERTY GEOLOGY AND MINERALISATION**

In his report, Crooker (1984) described the LYNDA LOU claims as being underlain almost entirely by Kobau Group metasediments. Subsequent observations of outcrop and magnetometer data during the 1989 program appear to confirm this, with a few minor exceptions. In addition to the gabbro intrusion on the WHY claim, minor outcrops of porphyritic granite were noted at the south end of the CRISP claim. This "new" intrusive body cuts the schist unit at this point, and, texturally, appears much younger than the gabbro body to the south. It is probable that the gabbro body is contemporaneous with the Jurassic Fairview Granodiorite, while the "new" intrusion is related to the younger, more felsic Oliver pluton.

LEGEND

- |                         |   |  |
|-------------------------|---|--|
| CENOZOIC                | TERTIARY  |  |
|                         | MIOCENE (?)   |  |
|                         | 21  | Basalt; minor olivine basalt   |
|                         | OLIGOCENE (?)   |  |
|                         | 20  | CORYELL PLUTONIC ROCKS: syenite, granite; minor monzonite and shonkinite   |
|                         | EOCENE OR OLIGOCENE   |  |
|                         | 19  | Andesite, trachyte, minor basalt; locally, interbedded tuff and shale; 19a, andesite and trachyte flows and agglomerate; 19b, conglomerate, sandstone, shale, tuff; minor agglomerate and breccia; coal; 19c, andesite and trachyte; 19d, agglomerate and conglomerate |
|                         | PALEOCENE OR EOCENE   |  |
|                         | 18  | Porphyritic granite and rhyolite   |
|                         | 17  | Conglomerate, sandstone, shale, tuff   |
| MESOZOIC                | CRETACEOUS (?)  |  |
|                         | 16  | VALHALLA PLUTONIC ROCKS: granite, granodiorite   |
|                         | 15  | NELSON PLUTONIC ROCKS: granodiorite, quartz diorite, diorite; granite, quartz monzonite, syenite, monzonite  |
|                         | JURASSIC (?)  |  |
|                         | 14  | 14a, pyroxenite; 14b, hornblende; 14c, serpentinite  |
|                         | TRIASSIC OR JURASSIC  |  |
|                         | 13  | Limestone  |
|                         | TRIASSIC  |  |
|                         | UPPER TRIASSIC  |  |
|                         | NICOLA GROUP  |  |
| 12                      | Greenstone, tuff, quartzite, limestone, argillite, and schist   |  |
| TRIASSIC OR EARLIER     |   |  |
| 8-11                    | 8. BARSLOW FORMATION: argillite<br>9. INDEPENDENCE FORMATION: chert, greenstone<br>10. SHOEMAKER FORMATION: chert, some tuff and greenstone<br>11. OLD TOM FORMATION: greenstone, minor diorite |  |
| PERMIAN AND/OR TRIASSIC |   |  |
| ANARCHIST GROUP         |   |  |
| 7                       | Greenstone, quartzite, greywacke, limestone; locally paragneiss   |  |
| PALAEOZOIC              | PERMIAN AND (?) PENNSYLVANIAN   |  |
|                         | 5,6   | 5. CACHE CREEK GROUP: greenstone, quartzite, argillite, limestone<br>6. BLIND CREEK FORMATION: limestone; limy argillite   |
|                         | CARBONIFEROUS (?)   |  |
|                         | KOBAU GROUP   |  |
| 4                       | Quartzite, schist, greenstone   |  |
| PRECAMBRIAN OR LATER    | PRE-PERMIAN   |  |
|                         | 3   | OLD DAVE INTRUSIONS: serpentinitized ultrabasic rocks  |
|                         | CHAPPERON GROUP   |  |
|                         | 2   | Chlorite schist, quartzite   |
| MONASHEE GROUP          |   |  |
| 1                       | Layered gneiss (paragneiss); minor schist, amphibolite, quartzite, marble, and pegmatite  |  |
- 
- |       |  |
|-------|--|
| ..... | Drift-covered area                         |
| ..... | Geological boundary (defined, approximate) |
| ..... | Bedding (horizontal, inclined)             |
| ..... | Bedding, tops unknown (inclined, vertical) |
| ..... | Gneissosity (inclined, vertical)           |
| ..... | Schistosity (inclined, vertical)           |
| ..... | Fault (defined, approximate, assumed)      |
| ..... | Lincation                                  |
| ..... | Glacial striae                             |
| ..... | Fossil locality                            |
| ..... | Mineral property                           |



Structurally, the metasediments appear to follow a broad synclinal fold with its axis striking NNW and dipping moderately to the north. Mader et al have mapped a series of "megascopic open buckle folds..with subvertical axial planes" further up the valley of Blind Creek. Since no one horizon within the metasediments can be traced for any appreciable distance in outcrop, smaller scale structures could not be determined. A large scale fault or shear zone does appear to cut the sediments, trending northeast across the southern half of the property. This feature is reflected in the steep bluffs on the WHY claim

The metasediments are cut by various small, milky white, massive quartz veins, generally narrow and inconsistent along strike. At some points, probably in fold hinges, the veins swell considerably (up to 3 m. in an adit just north of the claims). These veins occur in two main sets - one set following bedding and a second set crosscutting the bedding at angles up to 60°. In some areas, these two sets overlap, causing a "stockwork" effect. No sulphides were observed in any of the quartz vein material on the claims, however pyrite occurs as disseminations coincident with the greenschist metamorphism in most sedimentary or volcanic outcrops. Some higher concentrations of pyrite associated with chlorite and minor epidote were noted in a small adit and some open cuts at the CRISP 2 / WHY NOT claim boundary near the claim post. It is thought that this is a skarn effect, related to the granitic intrusion located some 120 m. to the west.

Visual comparison of "typical" vein material from the LYNDA LOU claims with vein material from the Morning Star Mine in the Fairview Camp indicates two different styles of mineralization. While the Morning Star vein material is a glassy, grey quartz with a ribboned texture, the quartz veins on the LYNDA LOU claims are, as a rule, white, milky and amorphous. Sulphides (pyrite, galena and minor chalcopyrite) are readily apparent in the Morning Star veins, but do not appear in the veins on the LYNDA LOU claims.

## CURRENT PROGRAM

In his report to Little Bear Resources in 1983, R. W. Phendler recommended an initial program of geological mapping, soil geochemistry, and geophysical surveys (magnetometer and VLF - EM). In September of 1989, Little Bear Resources contracted Westore Engineering to complete the magnetometer survey over the LYNDA LOU claims to determine whether any hidden intrusive / sedimentary contacts existed on the property. Observations of outcrop geology were also made on the property and at the Morning Star Mine in the Fairview Camp in an attempt to relate the geological situations on the LYNDA LOU to those in the vicinity of the past producer.

A total of 16.15 kilometres of grid was reestablished from the previous program, and flagged at 100 m. intervals (most of the property's surface rights are held for cattle grazing and, as such are difficult to flag at close intervals). The instrument used was a Phoenix Model MV 1 fluxgate magnetometer (serial #7711) rented from Pacific Geophysical of Vancouver. East-west base lines were established along the previous baseline at 0+00 N and at 8+50 N and 6+00 S. Readings were taken along these lines at different times of the day and used to average readings, so as to inhibit the effects of atmospheric magnetic field disturbances. Readings along grid lines were taken at 25 m. spacings and are shown on figure 3. A base station for daily calibration was established at L 9 W / 0+00 S, beside the Oliver-Keremeos Road.

## RESULTS

The results of the magnetometer survey on the LYNDA LOU claim group were mixed. One anomaly was found on the 7+00 W line at 4+50 S, along the southern edge of a magnetic high, otherwise readings taken did not reflect any zones of sharp change, as one would expect at a sedimentary / intrusive contact. The anomaly might be related to the shear zone which crosses the claims in this area. The "new" intrusive and its apparent zone of alteration gave a weak response to the survey on the 5+00 W line but this response did not extend to the lines on either side. A weak "high" appears to outline the gabbro body and extends its outline westerly off the grid. No new quartz veins were found during this program, and those veins that were examined were not similar to the veins exposed at the Morning Star Mine in the Fairview Camp.

## **CONCLUSIONS AND RECOMMENDATIONS**

The 1989 exploration program on the LYNDA LOU claim group failed to locate any new zones of mineralization. The magnetometer survey did outline an area of high background on the WHY claim, with weak to moderately anomalous readings on its southern edge. This area of high background could reflect a buried intrusive body, since no outcrop exposures were noted in this area. A weak trend of higher readings appear to be related to a large shear zone that crosses the southern half of the claim group. No evidence of economic mineralization was noted in bedrock exposures along this trend, however these bedrock exposures were limited in size and number.

It is recommended that further EM - style geophysics be completed over this area of the property to check for any subtle conductors related to the magnetic trend.

## REFERENCES

Phendler, R. W., P.Eng; "Report on the LYNDA LOU Claim Group for Little Bear Resources Ltd."; 1983

Mader U., et al.; "Geology and Structure of the Kobau Group Between Oliver and Cawston..", B.C. M.E.M.P.R. Geological Fieldwork 1988, Paper 1989-1; 1989


Little, H. W.; " Kettle River (West Half), B.C.; Geological Survey of Canada, Map 15-1961; 1961

## CERTIFICATE OF QUALIFICATIONS

I, D. Dylan Watt, hereby certify that:

1. I am a Geologist under contract to Westore Engineering Ltd., Suite 703, 1112 West Pender Street, Vancouver, British Columbia V6E 2S1
2. I am a graduate of the University of British Columbia of Vancouver, B.C. having received a Bachelor of Science degree in Geological Sciences in 1984.
3. I have practised my profession continuously since 1984.
4. I have no securities, either directly or indirectly, in Little Bear Resources Ltd. or an affiliate, and I have no interest in the LYNDA LOU claims nor do I expect to receive any.
6. This report is based on data collected during my visit to the property in October of this year and a review of various government and private publications.

Dated at Vancouver, this 14th day of December, 1989.



D. Dylan Watt, B.Sc.

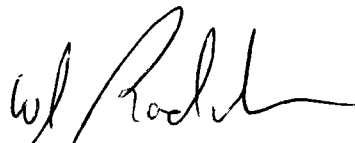


## CERTIFICATE OF QUALIFICATIONS

I, William J. Radvak, hereby certify that:

1. I am a Mining Engineer under contract to Westore Engineering Ltd., Suite 703, 1112 West Pender Street, Vancouver, British Columbia V6E 2S1
2. I am a graduate of the University of British Columbia of Vancouver, B.C. having received a B.A.Sc. in Mining and Mineral Process Engineering 1986.
3. I have practised my profession continuously since 1986.
4. I am a director of Little Bear Resources Ltd. and have securities in said Company.
5. I have no interest in the LYNDA LOU claims nor do I expect to receive any.
6. This report is based on data collected during my visit to the property in October of this year and a review of various government publications.

Dated at Vancouver, this 14th day of December, 1989.

A handwritten signature in black ink, appearing to read 'W. J. Radvak', written in a cursive style.

William J. Radvak, B.A.Sc.

## APPENDIX 1

### LIST OF PERSONNEL AND STATEMENT OF EXPENDITURES

The following expenses were incurred on the LYNDA LOU Claim Group as defined in this report for the purposes of mineral exploration between the dates of October 10, 1989 and October 17, 1989.

#### Personnel:

Geologist		
7 days @ \$300.00/day	\$2,100.00	
Assistant		
5 days @ \$150.00/day	<u>\$750.00</u>	
		\$2,850.00

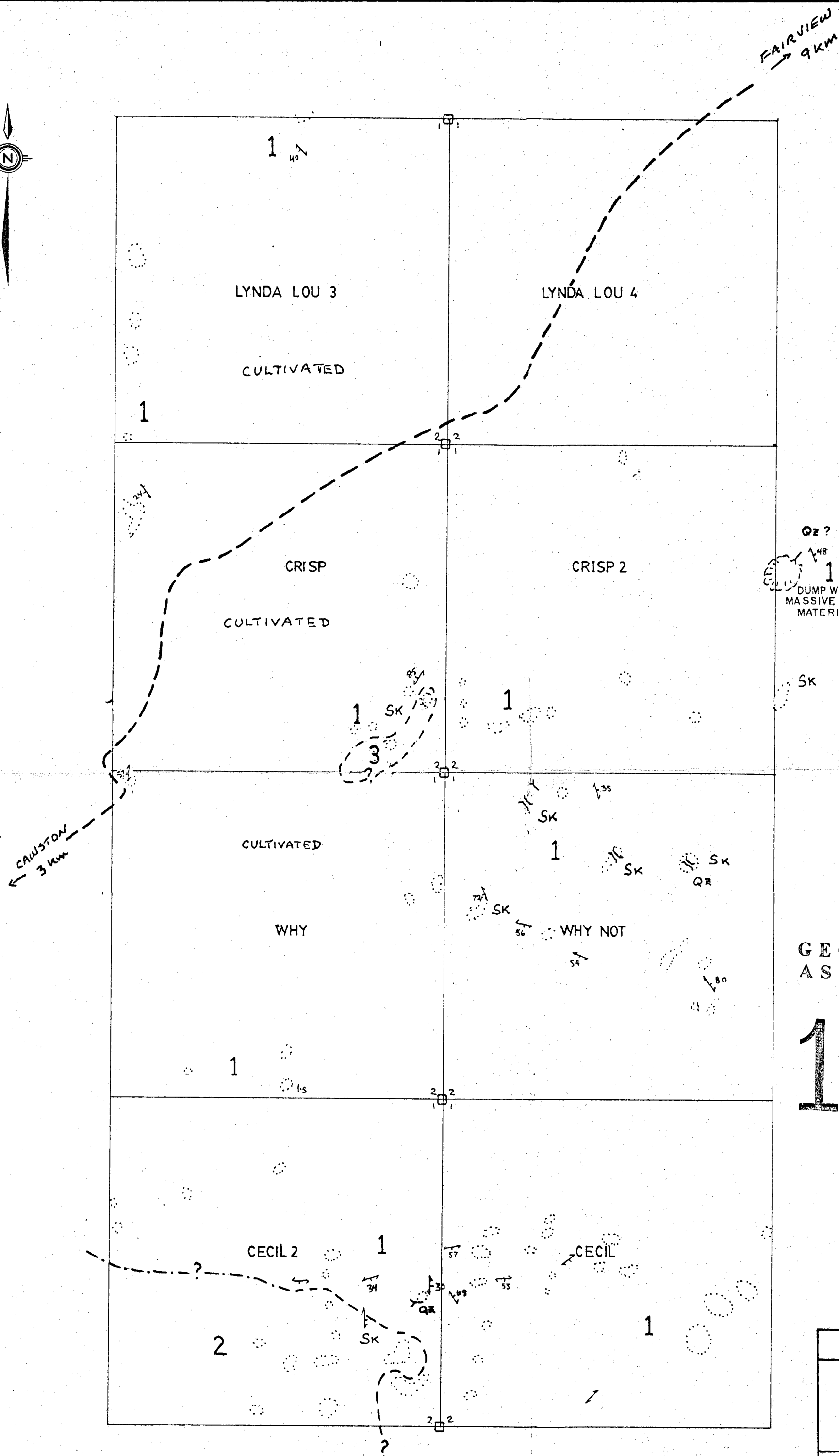
#### Disbursements:

Food and Accommodation		
10 man days @ \$50/day	\$ 500.00	
Magnetometer Rental		
5 days @ \$15/day	75.00	
Vehicle Rental		
5 days @ \$40/day	200.00	
1337 kms @ \$.15/km	200.55	
Fuel	125.75	
Report Materials		
copies, materials, etc.	<u>40.00</u>	
		\$1141.30

TOTAL EXPENSES

---

\$3991.30



**LEGEND**

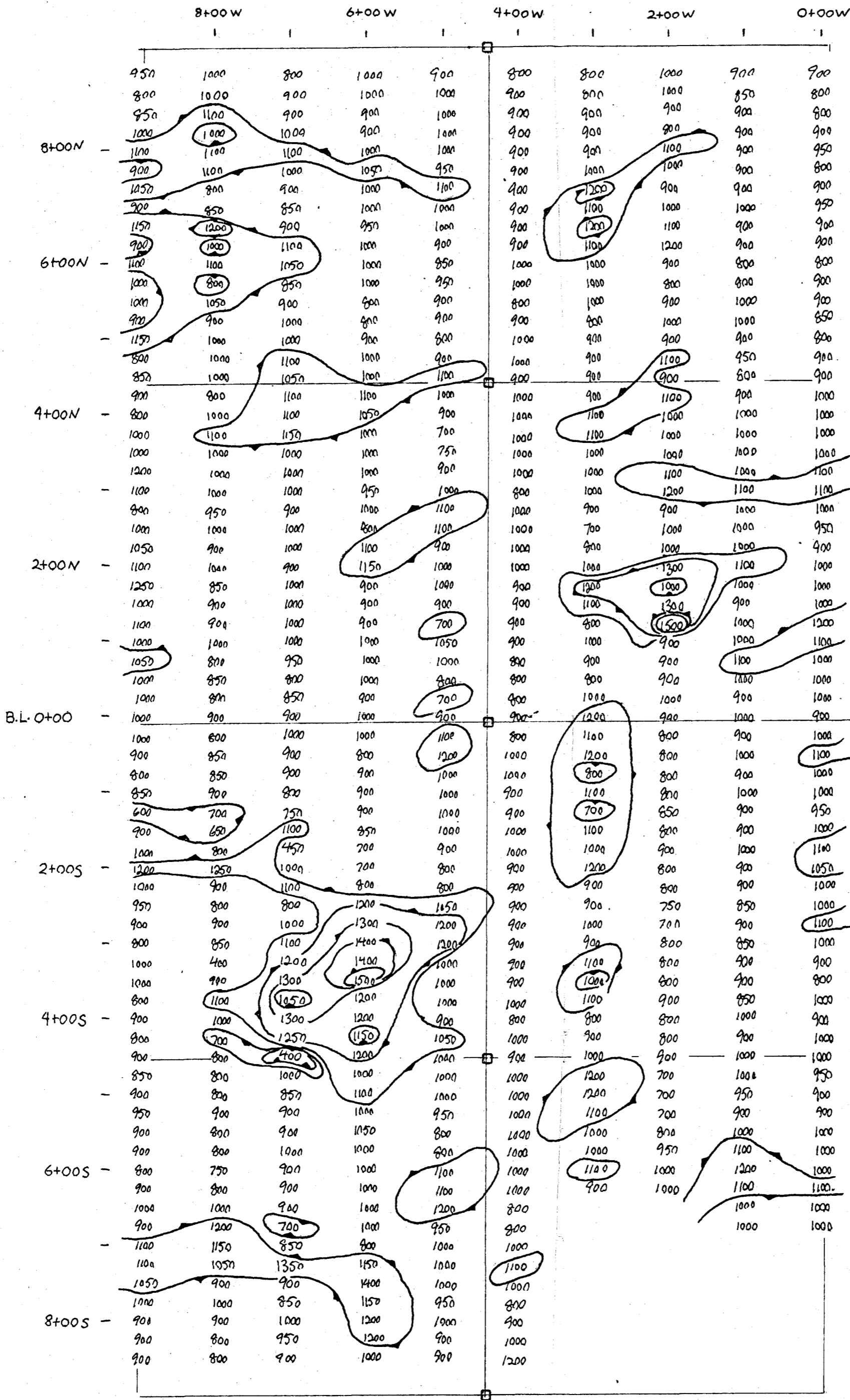
- 3 PORPHYRITIC GRANITE
  - 2 HORNBLENDE GABBRO
  - 1 KOBALU GROUP (Sediments & Volcanics) quartz mica schist with quartzite & minor marble
  - 56 Schistosity / bedding attitude
  - Outcrop exposure
  - QZ Quartz vein outcrop
  - SK Skarn alteration
- } age relation uncertain

**GEOLOGICAL BRANCH  
ASSESSMENT REPORT**

**19,427**

0 50 100 200 300 metres

LITTLE BEAR RESOURCES LTD.		
LYNDA LOU PROPERTY OSOYOOS M.D., B.C.		
PROPERTY GEOLOGY		
N.T.S. 82E/4E	SCALE: 1:5,000	FIG.
DATE: DEC. 1989	AFTER: CROOKER, 1984	5



**LEGEND**

1200 = Fluxgate magnetometer reading (gammas) minus background level (53,300 gammas)

→ = Direction of magnetic slope

GEOLOGICAL BRANCH  
ASSESSMENT REPORT

19,427

0 50 100 200 300 metres

LITTLE BEAR RESOURCES LTD.		
LYNDA LOU PROPERTY		
OSOYOOS M.D., B.C.		
<b>MAGNETOMETER SURVEY</b>		
N.T.S. 82E/4E	SCALE: 1:5,000	FIG.
DATE: DEC., 1989	SVY. BY: D.WATT	4