ASSESSMENT REPORT ON THE
BERENGARIA CLAIM GROUP,
BER 1 - 4 tenure #'s 362506 - 362509,
PONY 1 -12 tenure #'s 362917 - 362928,
RUTH 1 -7 tenure #'s 362510 - 362515, 363447,
RIO 1 - 4 tenure #'s 362624 - 362627
MINERAL CLAIMS
RIONDEL, BRITISH COLUMBIA
VLF-EM SURVEY

Slocan Mining Division
NTS: 82 F/10 W
Longitude: 116° 52' 00"
Latitude: 49° 42' 00"

Owners: Richard Deane, Mike Delich
Box 1133, 730
Rossland, B.C.
V0G 1Y0

Author: Dan Wehrle P.Geo. B.Sc. Honours Geology

May 18, 1999

GEOLOGICAL SURVEY BRANCH
ASSESSMENT REPORT

25,966

TABLE OF CONTENTS

LIST OF FIGURES

INTRODUCTION

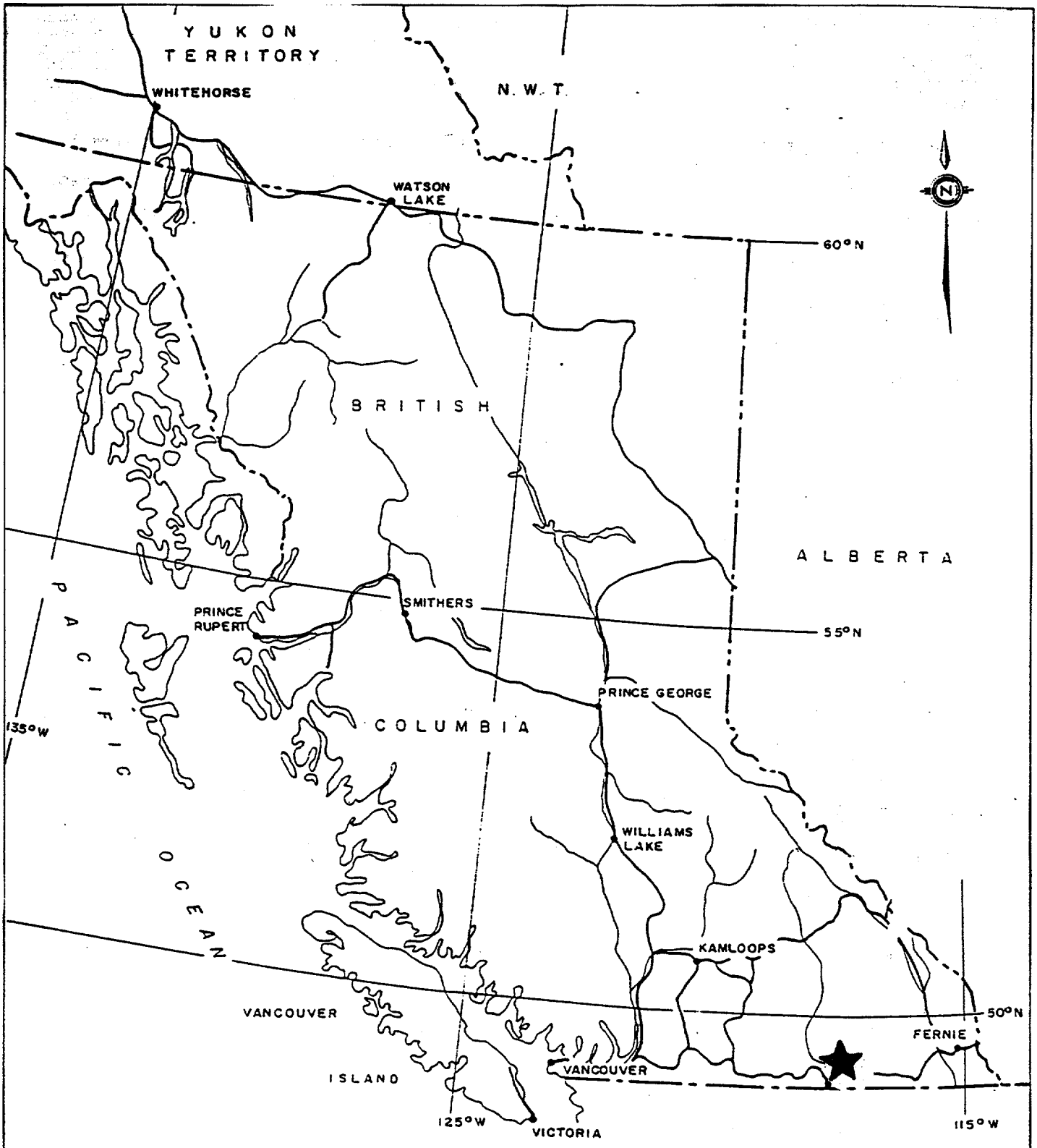
The VLF-EM data described in this report is being presented as assessment work for the Ber 1-4 (tenure #'s 362506-362509), Pony 1-12 (362917-362928), Ruth 1-7 (362510-362515, 363447) and Rio 1-4 (362624-362627) mineral claims of the Berengaria claim group.

The VLF-EM survey, covering 3.4 line km., was conducted between Apr. 20 and Apr. 26, 1999 on the Ruth 1-4 claims of the Berengaria claim group. This survey forms part of an on-going exploration program whose goal is to locate and define economic concentrations of mineral bearing sulfides near the past producing Bluebell mine area.

LOCATION AND ACCESS

The Berengaria claim group is located approximately 6 km. south of the town of Riondel in southeastern B.C. (fig. 1 and 2). Riondel is located on the east shore of Kootenay Lake, approximately 84 km. north of the United States border. Geographic coordinates of the approximate center of the Berengaria claim group are longitude 116^{o} 52' 00" W and latitude 49^{o} 42' 00" N on N.T.S. map sheet 82 F/10 west.

Riondel and vicinity is served by provincial highways 3A south to the town of Creston and west to Nelson via the Kootenay Lake ferry. Access to the property is good along numerous 4-wheel drive logging, power-line and cottage roads. The VLF grid lies between highway 3A and the east shore of Kootenay Lake, approximately 6 km. south of Riondel.



PROPERTY LOCATION

DATE	NTS: 82F / 10 W	FIGURE 1

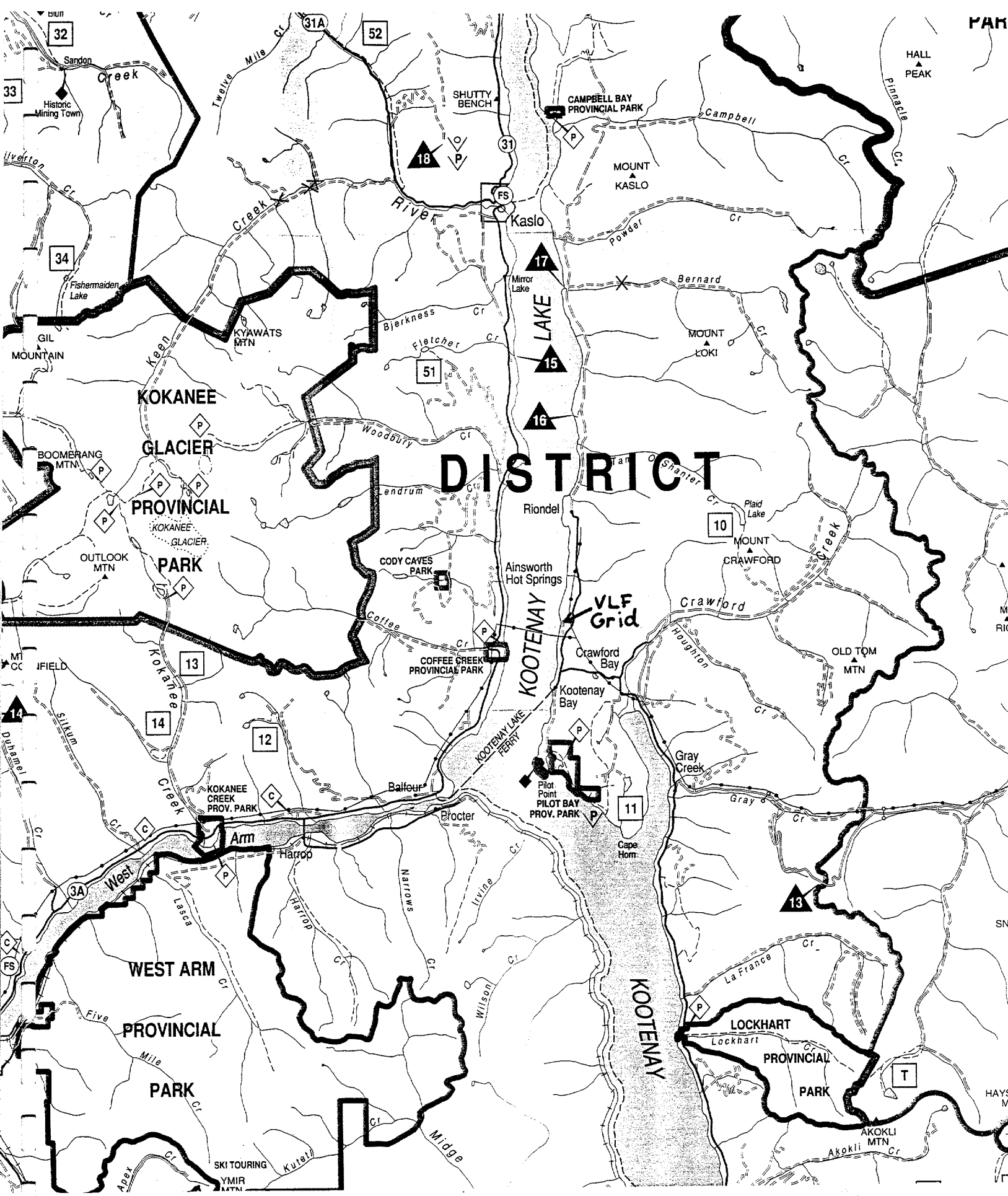


fig. 2 BERENGARIA GROUP CLAIM ASSESSMENT LOCATION MAP

PHYSIOGRAPHY AND VEGETATION

The Berengaria claim group is approximately 1300 meters above sea level, sloping gently up from the east shore of Kootenay Lake. The region has been affected by continental glaciation. Two ice directions have been recorded with the final advance being south. The claim group is blanketed by a thin cover of glacial till on the order of 1 to 3 meters thick. Outcrop exposures are limited to lakeshore, local ridges and road excavations.

The property is heavily wooded and locally logged with some dense bushy areas. Hemlock, fir, cedar, spruce and tamarack are the predominant forest cover. Most surface rights within the claim group are privately owned.

PROPERTY DESCRIPTION AND EXPLORATION HISTORY

The Berengaria claim group consists of 1 modified grid unit, the Ruth 7 (tenure # 363447) and 26 two-post mineral claims, the Ber 1-4 (tenure #'s 362506-362509), Pony 1-12 (362917-362928), Ruth 1-6 (362510-362515) and Rio 1-4 (362624-362627), totaling 30 claim units (fig. 3). These claims are presently in good standing and owned by Richard Deane and Mike Delich of Rossland, B.C.

The Bluebell mine near Riondel is one of the oldest mines in the province. The property was staked in 1882 and from 1895 to 1927 produced 489,888 tonnes grading 6.5 % lead and 8.2 % zinc. Cominco mined the deposit from 1952-1971, producing a further 4,333,694 milled tonnes grading 5.1 % lead, 6.1 % zinc, 0.1 % copper, 0.03 % cadmium and 48 grams silver per tonne (Hoy, 1980).

In 1927, the Berengaria Mining Company explored near the vicinity of a large mineralized boulder discovered near the mouth of Sherraden Creek. Although the source of the boulder was not discovered, it was mined and graded approximately 20 % combined lead-zinc and 93 grams silver per tonne (Hoy, 1980).

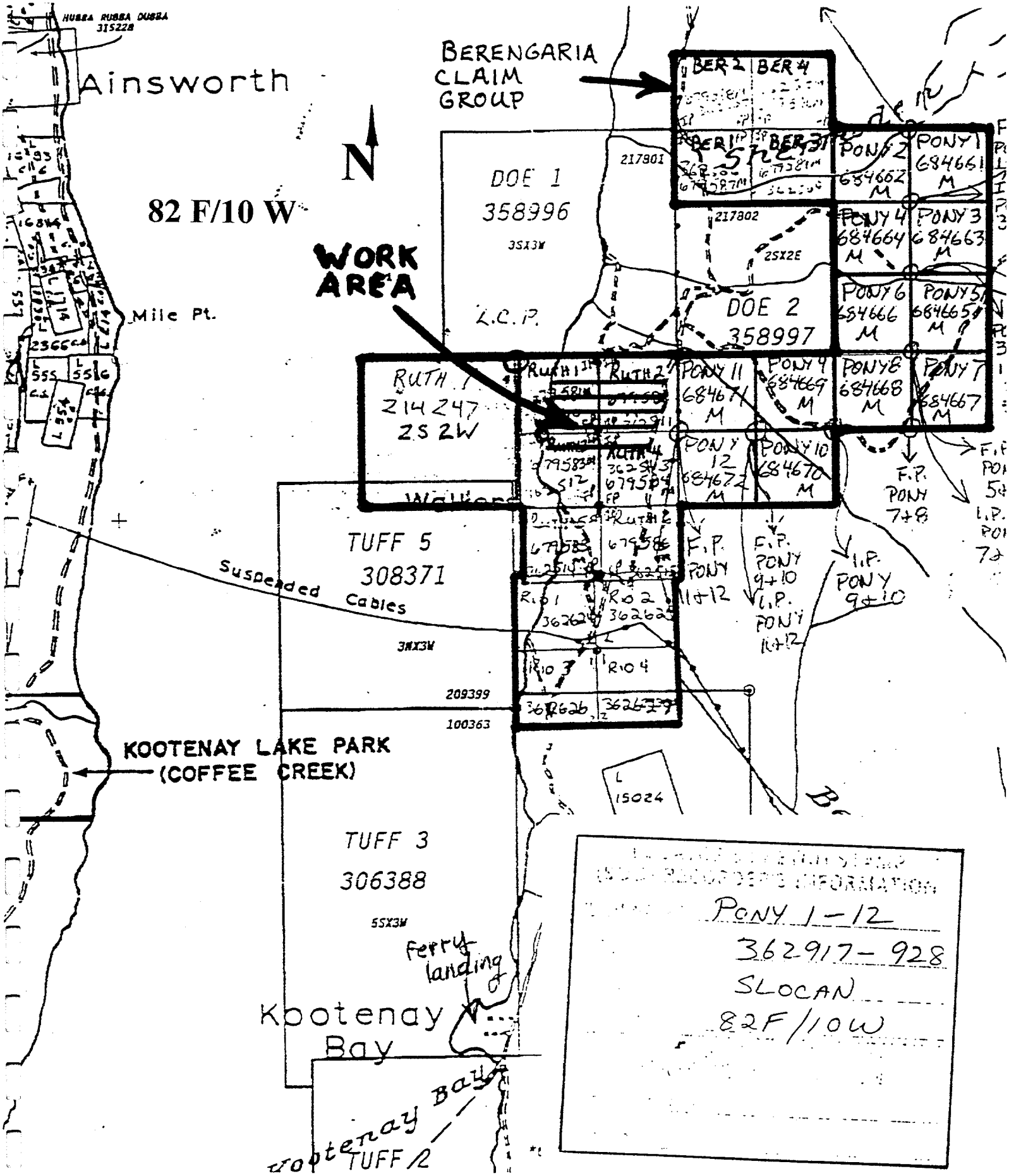


fig. 3 CLAIM AND GRID LOCATION MAP

Although small trenches are present on the Berengaria claim group there is no record of much of this activity. Little modern work of consequence has been done on the claim group since then.

GEOLOGY

The Riondel area is located in the central part of the Kootenay Arc, a structural zone characterized by north-trending tightly folded Precambrian to Early Mesozoic rocks. The grid area is underlain by calc-silicate and hornblende gneiss intruded locally by Late Mesozoic pegmatite and quartzo-feldspathic veining. The Bluebell mine near Riondel is hosted in the Lower Cambrian Badshot marble. Here localized steep cross-fractures that trend west/northwest and dip 85^{o} north host lead-zinc orebodies that plunge westward following the intersection of the fractures with the marble (Hoy, 1980).

OBJECTIVE OF PRESENT WORK

Previous exploration and mining on nearby claims show mineralization hosted within roughly north trending limestone/marble stratigraphy. A surface VLF-EM grid geophysical program was designed to test for north trending conductors on the Ruth 1 - 4 claims (fig.3). An east-west field grid was set up with lines 100 meters apart and stations at every 25 meters. VLF readings were taken at each station using the Seattle transmitter.

INSRUMENTATION AND THEORY

A VLF-EM receiver, model 27, manufactured by Sabre Electronic Instruments Limited of Burnaby B.C. was used for the VLF electromagnetic survey. This instrument is designed to measure the electromagnetic component of the very low frequency field (VLF-EM). The source of the primary field used was the U.S. navy submarine transmitter at Seattle, Washington which transmits at a frequency of 18.6 kHz.

In electromagnetic prospecting, a transmitter produces an alternating magnetic field (primary) by a strong alternating current usually through a coil of wire. If a conductive mass such as a sulfide body is within the magnetic field, a secondary alternating current is induced within it which in turn produces a secondary magnetic field which can be detected at surface through deviations of the normal VLF field.

VLF means very low frequency, about 15 to 25 kilocycles per second. Relative to frequencies generally used in geophysical exploration, this is actually very high. Consequently the high frequency of the VLF-EM method results in numerous anomalies from lower conductive sources such as swamps, creeks, topographic highs, electrolyte-filling faults or shear zones, porous horizons, graphite, carbonaceous sediments, lithological contacts, as well as sulfide bodies of too low a conductivity for other EM methods to pick up. On the other hand, the tendency for VLF to respond to poor conductors has aided in mapping faults and rock contacts as well as picking up conductors of too low a conductivity for conventional EM methods and too small for induced polarization.

VLF data may have anomalies and it would be nearly impossible to differentiate between those that are geologically significant and those that are not. Thus, VLF-EM preferably should not be interpreted without a good geological knowledge of the property and/or other geophysical and geochemical surveys.

PROCEDURE

Dip angle readings were taken at 25 meter intervals along grid lines 1+00 south to 5+00 south. Readings were always made with the instrument pointed away from the 18.6 kHz transmitter station at Seattle Washington.

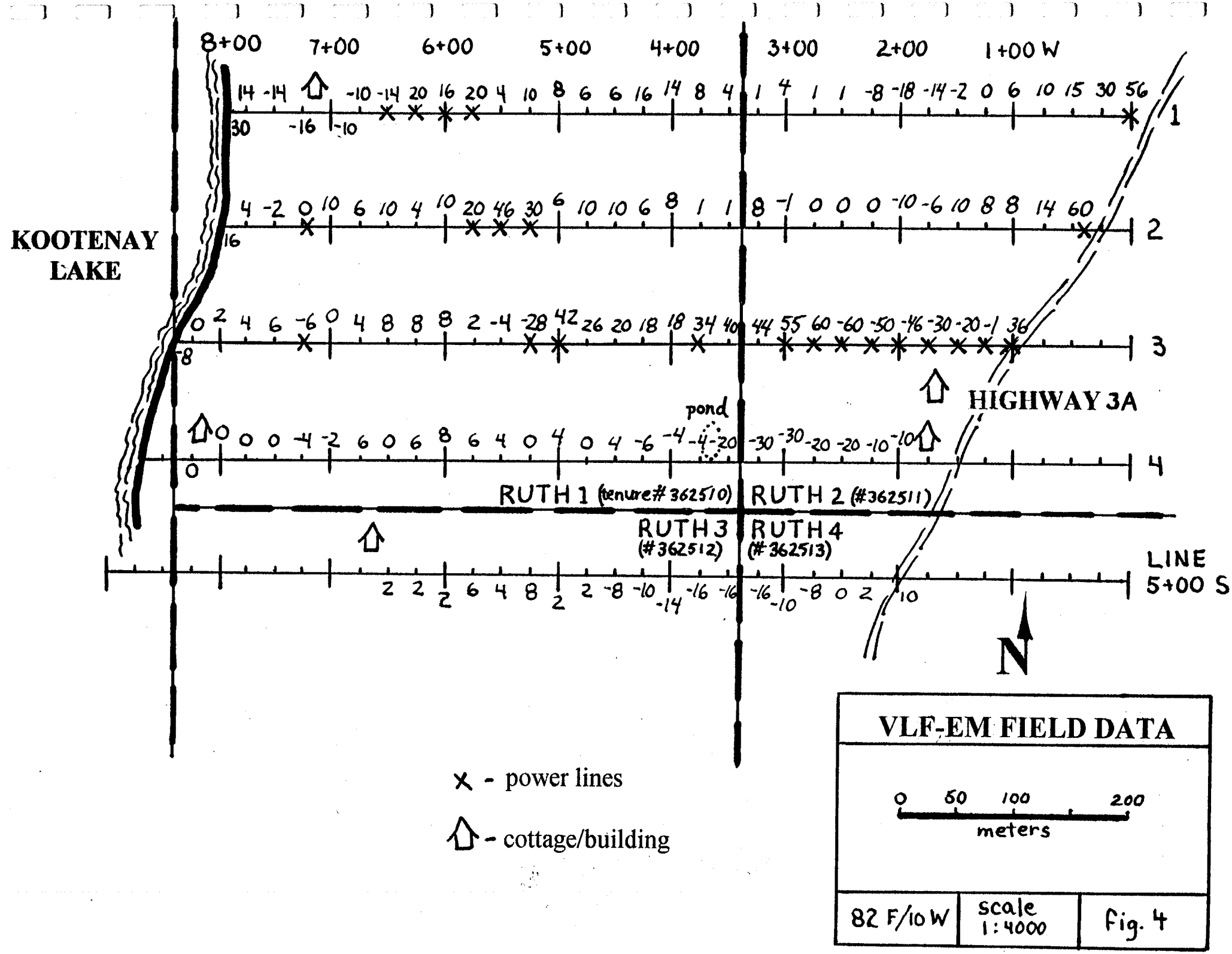
COMPILATION OF DATA

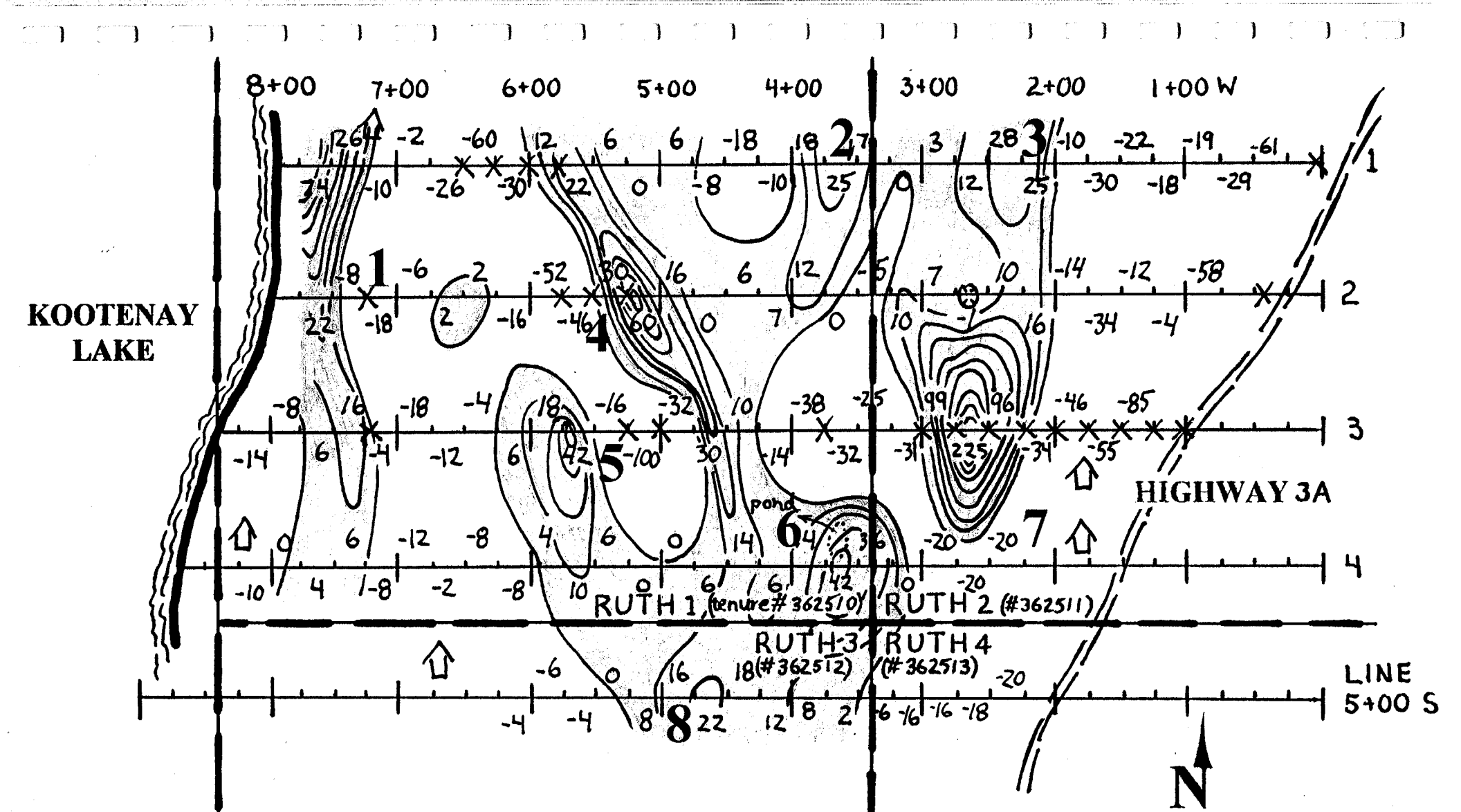
The VLF-EM field results were reduced for plotting by applying the Fraser filter. This is essentially a 4-point difference operator which transforms 0 crossings into peaks, and a low pass smoothing operator which reduces the inherent high frequency noise in the data. Thus noisy, non-contourable data are transformed into a less noisy, contourable form. Another advantage is that a conductor that does not show up as a cross-over on the unfiltered data will quite often show up as a peak on the filtered data. The original field data is recorded on figure 4. The filtered data was plotted at reading station midpoints and the positive values contoured at 10 degree intervals beginning at zero (fig. 5).

DISCUSSION OF RESULTS

A moderate and continuous north trend is evident for the VLF anomalies, roughly paralleling the trend of known mineralized structures. Eight distinct anomalies are evident from the results (fig. 5).

Anomaly #1 in the northwest corner of the grid, is centered on 7+50 west between lines 1+00 and 4+00 south. Although it is associated with power cables on lines 2 and 3, the strongest portion of this anomaly on line 1appears to be the beginning of a strong natural anomaly. Unfortunately the lakeshore was reached in this area and prevented acquisition of further data.


8+00
7+00
6+00
5+00
4+00
3+00
2+00
1+00 W
KOOTENAY LAKE
HIGHWAY 3A
pond
RUTH 1 (tenure# 362510)
RUTH 2 (#362511)
RUTH 3 (#362512)
RUTH 4 (#362513)
LINE 5+00 S
N
1
2
3
4
× - power lines
- cottage/building
VLF-EM FIELD DATA
0 50 100 200
meters
82 F/10 W
scale 1:4000
Fig. 4



VLF-EM FRASER FILTERED DATA		
0 50 100 200 meters		
82 F/10 W	scale 1:4000	Fig. 5

Anomalies #2 and #3, on line 1 south at 3+75 and 2+25 respectively, are possibly part of a larger trend including anomaly #7. They are free of power line disturbance and appear to continue northward.

The thin, moderate #4 anomaly striking incongruently north-northwest, is a powerline generated phenomena. Anomaly #5 on line 3 south at 5+75 west, appears to be a powerline enhanced feature. It is ovoid shaped, not thin, and strikes north but does have a powerline nearby.

Anomaly #6 on line 4 south at 3+65 west is a moderate one-line feature associated with a prominent gully. Small pits and a pond were noted nearby. The strong #7 VLF anomaly is an intense powerline feature or at best a strongly enhanced portion of the #2, #3, #7 VLF trend. Anomaly #8 appears to be broad, weak and free of powerline interference.

The conductive trends are open north and south of the grid. The data strongly suggests that some portion of anomaly #1 continues west of the grid beneath Kootenay Lake.

CONCLUSIONS AND RECOMMENDATIONS

The VLF-EM responded well to the known mineralized trends of the area. Since the grid area tested on the Berengaria claim group lays only 6 km. south of the Bluebell mine workings, it is possible that the Ruth claim VLF anomalies represent areas of increased sulfide concentration.

These anomalies could be further tested by decreasing the grid line spacing (25 or 50 meter grid line spacing) and thereby increasing the fine detail. Further reconnaissance VLF-EM (100 meter additional grid line spacing), may show improved conductor quality along strike north and south of the known anomalies. An attempt should be made to more completely assess the western portion of anomaly

#1 under Kootenay Lake. It is also recommended that geological prospecting, mapping and possibly rock and soil sampling be carried out over areas associated with the #1, 2, 3, 5, 6 and 8 Berengaria group VLF-EM anomalies.

ITEMIZED COST STATEMENT

Labor: Professional Geoscientist:

- 1.5 days claim orientation and grid setup	$ 525.00
- 1.5 days VLF instrument operator	$ 525.00
- 2 days report writing	$ 700.00
- 1 day drafting	$ 350.00

Expenses:

- 3 days 4 X 4 vehicle rental	$ 375.00
- VLF rental	$ 400.00
- field supplies and rentals	$ 125.00
- computer and drafting supplies	$ 100.00
Total	$3,100.00

REFERENCES

B.C. Ministry of Mines Annual Reports 1898 - 1972.

Dietrich, R.V., Dutro, J.T. and Foose, R.M. (1982): AGI Data Sheets, for Geology in the Field, Lab and Office. Carolyn Ormes, editor, American Geological Institute.

Hoy, T., Dunne, K.P.E. and Wilton, P. (1993): Massive Sulfide and Precious Metal Deposits in Southeastern B.C. GAC Field Trip Guidebook May, 1993.

Hoy, T. (1980): Geology of the Riondel Area Central Kootenay Arc Southeastern B.C. Bulletin 73, B.C. ministry of Energy, Mines and Petroleum Resources.

MINFILE

Paterson, N.R. and Hallof, P.G. (1990): Geophysical exploration for gold. From Gold Metallogeny and Exploration, R.P. Foster, editor Blackie and Sons, Glasgow UK, pp. 360-398.

Wehrle, D. (1996): Preliminary Report of Investigations on the Mammoth Project, Southeastern B.C. Unpublished.

AUTHOR'S QUALIFICATIONS

I, Dan Wehrle, of 1619 Spokane Street, in the City of Rossland in the Province of British Columbia do hereby certify that:

1) I am a Professional Geoscientist registered with the Association of Professional Engineers and Geoscientists of British Columbia.

2) I am a 1985 graduate of the University of Saskatchewan with a B.Sc. Honours degree in Geology and have practiced my profession as Exploration Geologist continuously since 1985.

3) This report is based on work supervised by myself on the Berengaria group claims in southeastern British Columbia.

4) I have not received nor expect to receive any interest direct or indirect, in the properties mentioned in this report.

Dated this 18th day of May, 1999 in the City of Rossland, British Columbia.

Dan Wehrle

D. M. Wehrle, P.Geo.