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**PRELIMINARY  
GEOLOGICAL AND GEOCHEMICAL REPORT  
ON THE  
KANE CREEK PROPERTY**

Slocan Mining Division, B.C.  
NTS 82K/3W, 3E  
(50°02'15"N to 50°06'23"N, 117°14'49"W to 117°20'00"W) FILMED

for

**EXCELLON RESOURCES INC.**  
109 - 525 Seymour St.  
Vancouver, B.C. V6B 3H7  
(604)682-4787

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VANCOUVER, B.C.

by

**STEPHEN P. WILLIAMS, B.Sc., Geologist**  
Supervised by: **CARL G. VERLEY, B.Sc., Geologist**  
Amerlin Exploration Services Ltd.  
108 - 525 Seymour Street  
Vancouver, B.C. V6B 3H7  
(604)689-1868

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February 1989

ARIS SUMMARY SHEET

District Geologist, Nelson

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ASSESSMENT REPORT 18547

MINING DIVISION: Slocan

PROPERTY: Kane Creek  
LOCATION: LAT 50 04 00 LONG 117 18 00  
UTM 11 5545867 478528  
NTS 082K03W

CAMP: 006 Slocan Camp

CLAIM(S): MJM,MLD 9  
OPERATOR(S): Excellon Res.  
AUTHOR(S): Williams, S.P.;Verley, C.G.  
REPORT YEAR: 1989, 53 Pages

COMMODITIES

SEARCHED FOR: Gold,Silver,Lead,Zinc,Molybdenum/Molybdenite  
KEYWORDS: Triassic,Jurassic,Slocan Group,Phyllite,Argillite,Galena  
Quartz Vein

WORK

DONE: Geochemical,Physical,Geological  
GEOL 100.0 ha  
Map(s) - 2; Scale(s) - 1:10 000  
PETR 9 sample(s)  
ROAD 0.7 km  
ROCK 17 sample(s) ;ME  
SILT 5 sample(s) ;ME  
SOIL 55 sample(s) ;ME  
TREN 20.0 m

MINFILE: 082KSW

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1 Property Geology . . . . .	in pocket
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EXCELLON RESOURCES INC.  
PROPERTY LOCATION MAP

KANE CREEK PROPERTY  
SLOCAN MINING DIVISION, B.C. NTS 82K/3W, 3E

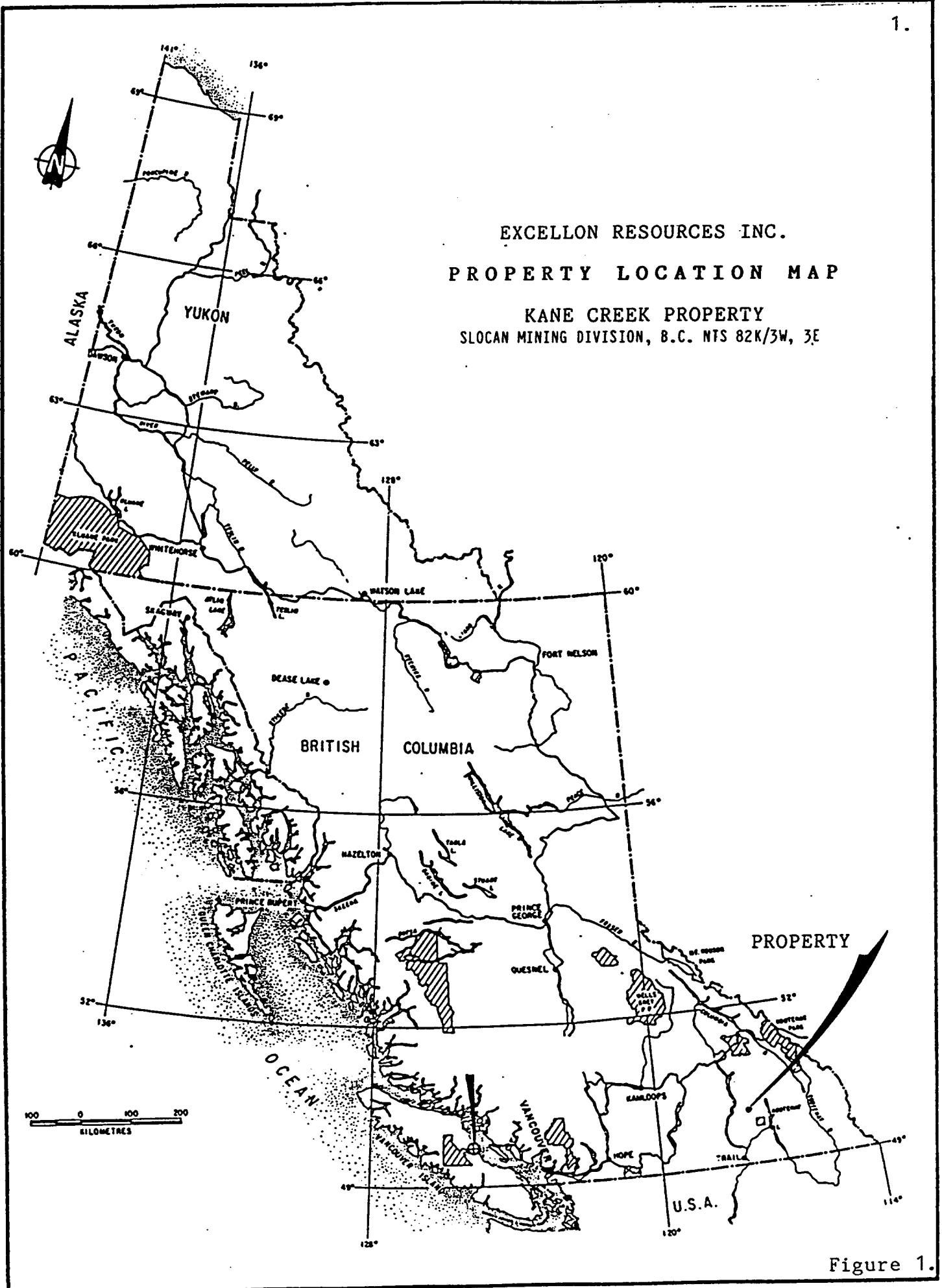


Figure 1.

### SUMMARY

Excellon Resources Inc. has an option on the MJM and MLD 9 - 13 mineral claims. The claims are situated in one contiguous block centered approximately 12 kilometres northeast of New Denver, in the Selkirk Mountains, Slocan Mining Division (NTS 82K/3W, 3E), British Columbia. The property is accessible by road.

The ground is situated in an area underlain by a succession of Triassic to Lower Jurassic Slocan Group sediments, which have been intruded by a number of feldspar porphyry bodies. Gold-silver-lead-zinc mineralization is associated with the intrusives.

The current program of work on the claim group consisted of limited geological mapping, rock, contour soil and stream silt sampling, as well as trenching. On the eastern side of the property gold-silver-lead-zinc mineralization occurs at the 'Main Vein'. Grab samples from the altered and brecciated footwall to the Main Vein assay up to 0.182 oz/ton Au, 13.32 oz/ton Ag, 5.89% Pb and 0.47% Zn. An area of anomalous gold, silver and molybdenum in soils indicates that there is potential for locating a precious metal-bearing porphyry system on the property. Further work is strongly recommended to test the extent of the known mineralization and to continue evaluation of the property. The estimated cost of the recommended program is \$300,000.

## RECOMMENDATIONS

A success contingent exploration program is recommended to further evaluate the Kane Creek property. Work should be undertaken with the objective of defining the surface distribution and nature of mineralization. Contingent upon the success of this work detailed drill evaluation can be initiated.

## Recommended Program:

1. Geological mapping:
  - Completion of entire claim block at 1:5,000
2. Prospecting:
  - Entire claim block.
3. Geochemistry:
  - Continued soil, silt and rock sampling.
4. Geophysics:
  - Induced polarization tests.
5. Drilling:
  - Initial testing of showings.

Respectfully submitted,  
Amerlin Exploration Services Ltd.

*Stephen P. Williams*

Stephen P. Williams, B.Sc.

Vancouver, B.C.  
February 24, 1989.

## INTRODUCTION

This report compiles results of a preliminary evaluation of the MJM and MLD 9 - 13 mineral claims conducted during the period October 27 to November 21, 1988. The property is held subject to an option agreement by Excellon Resources Inc. The object of the work was to prospect, map and sample the ground in an area containing a prominent vein structure, referred to as the 'Main Vein'.

## LOCATION

The claim group is centered approximately 12 kilometres northeast of New Denver in the Slocan Ranges of the Selkirk Mountains, Slocan Mining Division, B.C. at latitude  $50^{\circ}04'30''\text{N}$  and longitude  $117^{\circ}18'00''\text{W}$ , covering part of map-sheets 82K/3W,3E.

## PHYSIOGRAPHY

The ground consists of generally rugged mountain terrain. Elevations range from 1128 to 2210 meters above sea level. The lower peripheral portions of the property are steep and thickly forested, locally with heavy undergrowth. The upper central part lies above the tree-line where the slopes are more gradual.



## ACCESS

The property is accessible on the western side from Rosebery via Highway 6 for 0.7 kilometers, then for 3.5 kilometers along a two lane logging road up Wilson Creek, then for 8 kilometers along spur lines; on the eastern side from New Denver via Highway 31A for 9 kilometers to Three Forks and then for 8 kilometers along an old mining road up Kane Creek that passes within a few hundred meters of the property. Access to the core of the claim block is most easily achieved by helicopter from Nakusp.

## HISTORY

The Slocan mining camp has been a prolific silver-lead-zinc producer (Cairnes, 1934 and 1935). Since the initial discoveries in the area in the late 1800's numerous mines have been developed. Two past producers in close proximity to the Kane property are the McAllister and Miner Boy. Both deposits are located approximately 3 kilometers to the east of the claims, across Kane Creek. Production records for the McAllister indicate that 23,770 tons of ore grading 44 oz/ton Ag and 0.08% Pb were won as the result of intermittent operations from 1903 to 1980. The Miner Boy reportedly produced 140 tons grading 147 oz/ton Ag and 8.3% Pb during the period 1893 to 1947. Currently, Dickenson

Mines Limited is operating the Silvana mine at Sandon, located 10 kilometers southeast of the Kane property. The Silvana is a vein type Ag-Pb-Zn deposit hosted in the Slocan Group sediments. The Willa property, located 20 kilometers south of the Kane, is a large tonnage Au-Ag-Cu porphyry deposit presently being developed for production by Northair Mines Limited.

Evidence of previous exploration work on the Kane property is demonstrated by the existence of several adits and trenches located on the MJM claim. Most of this exploration was focused on a vein in a feldspar porphyry. No records of this work have been located. More recently the Kane Creek property was staked by Amoco Canada Petroleum Co. Ltd. as the Kane 1 - 3 claims in the late 1970's. Amoco's work on the property outlined a molybdenum-copper-tungsten soil anomaly which was never followed-up. The ground was again staked in 1987 by Michael McCrory one of the current optionees of the claims.

## PROPERTY

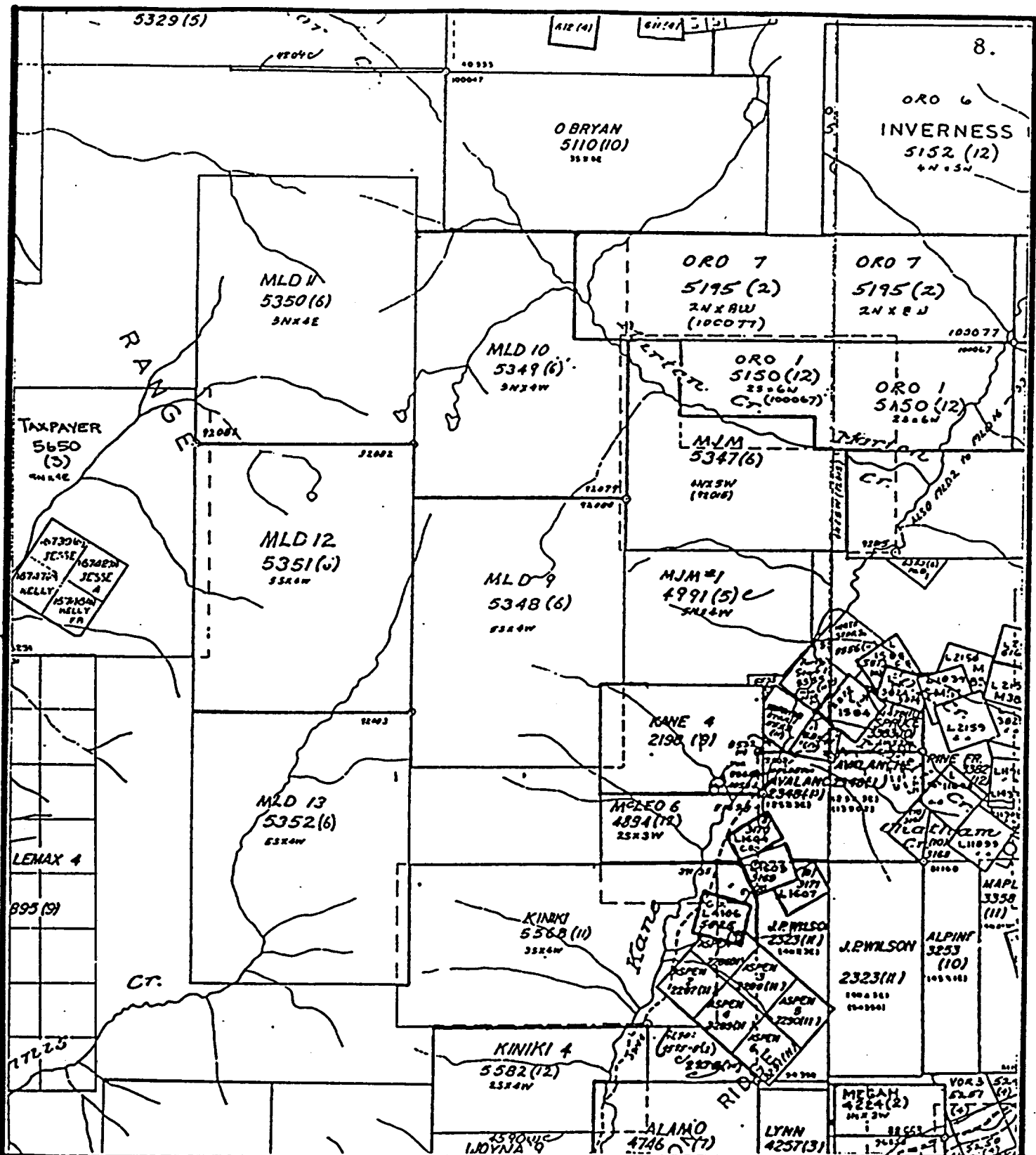
The Kane Creek property consists of a contiguous block of 6 - 20 unit mineral claims as tabulated below and illustrated on Figure 2. The claims are located in the Slocan Mining Division, B.C. (NTS 82K/3W, 3E).

Excellon Resources Inc. has the right to earn a 60% interest in the MJM and MLD 9 - 13 claims by fulfilling the terms of a purchase option agreement granted by Lance Steigenberger and Michael McCrory. Daley Resources Inc. is a co-optionor to the agreement and has a right to a 40% interest in the property upon exercise of the option.

Table 1. Mineral Claims

<u>Claims</u>	<u>Record Numbers</u>	<u>Expiry Date</u>
MJM	5347	June 9, 1991*
MLD 9	5348	June 9, 1991*
MLD 10	5349	June 9, 1991*
MLD 11	5350	June 9, 1991*
MLD 12	5351	June 9, 1991*
MLD 13	5352	June 9, 1991*

\*Pending acceptance of assessment work.



EXCELLON RESOURCES INC.

CLAIM MAP

KANE CREEK PROPERTY  
 SLOCAN MINING DIVISION, B.C. NTS 82K/3W, 3E

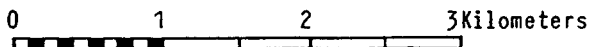
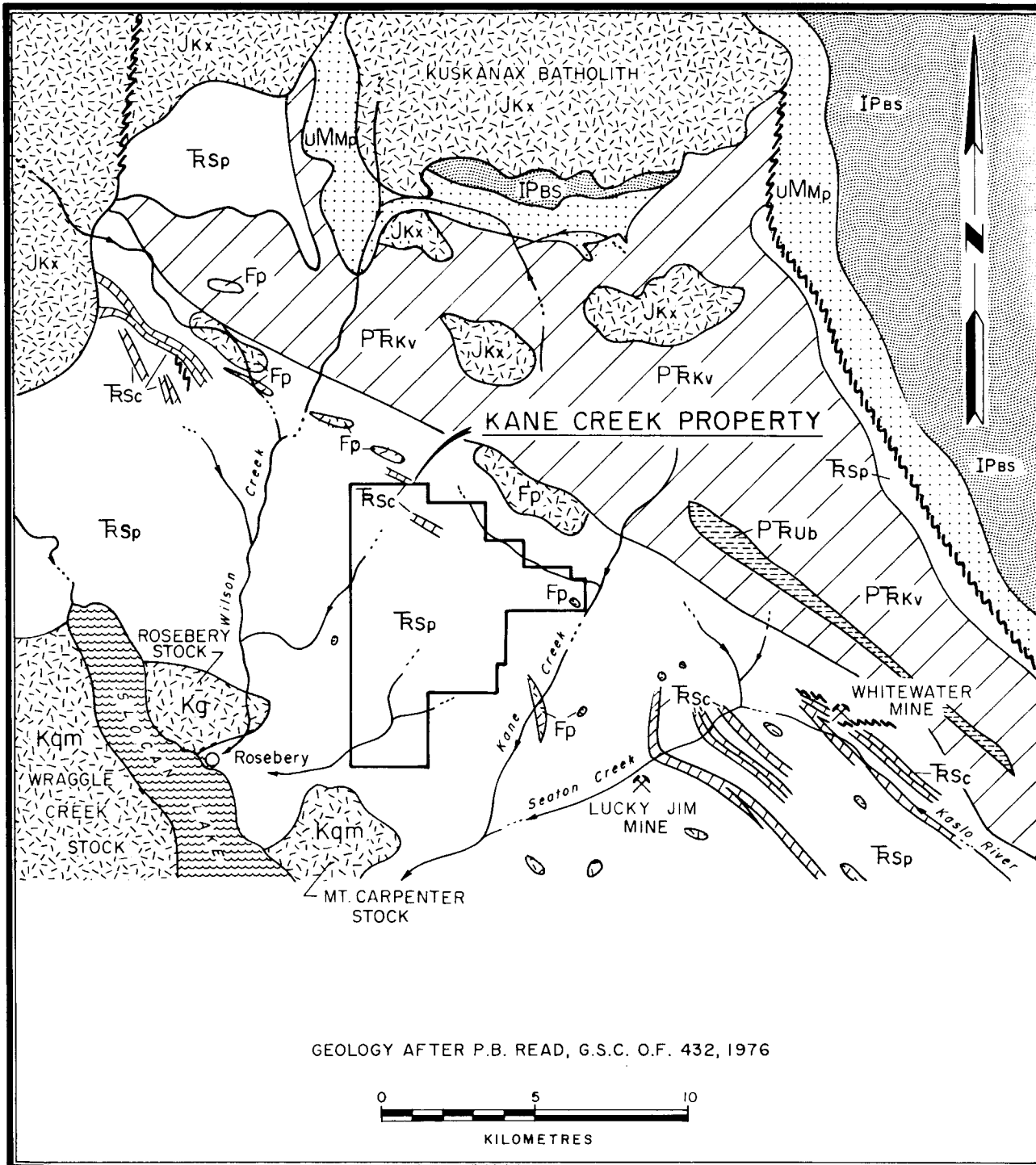


Figure 2.

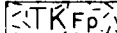

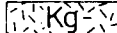
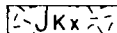



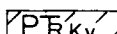
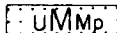

## GEOLOGY

### REGIONAL





The MJM and MLD 9 - 13 claims are situated in the Intermontane Superterrane (Wheeler, et al., 1989) which consists of terranes amalgamated in latest Triassic time and accreted to ancestral North America in the Jurassic. In the project area, the Superterrane is divisible into several terranes ranging in age from Cambrian to Triassic. The Slide Mountain terrane contains the Kaslo Group of Permian and/or Triassic age (Read, 1976). This succession consists of oceanic, marginal basin volcanics and sediments. Kaslo Group rocks are exposed to the north of the property. Quesnellia terrane, Triassic to Jurassic age sediments and volcanics of the Slocan Group, unconformably overlies the Slide Mountain. The Slocan Group developed in an island arc environment. After accretion of the Slide Mountain and Quesnellia terranes several intrusive events took place in the project area. Emplacement of the Jurassic Kuskanax quartz monzonite batholith occurred to the north, then to the south, intrusion of the Lower Cretaceous Nelson Batholith, a mainly porphyritic granite with lesser non-porphyritic granodiorite phases. In addition a variety of small stocks and dykes of Upper Jurassic or Cretaceous age intrude the Slocan.



## LEGEND LITHOLOGIES

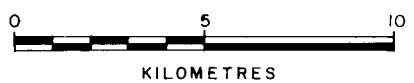
- TERTIARY-CRETACEOUS**  
 **FELDSPAR PORPHYRY**
- CRETACEOUS**  
 **QUARTZ MONZONITE**  
 **GRANITE, QUARTZ MONZONITE**
- JURASSIC**  
 **AEGERINE-AUGITE LEUCOQUARTZ MONZONITE**
- TRIASSIC SLOCAN GROUP**  
 **GREY TO BLACK PHYLLITE, ARGILLITE, QUARTZITE**  
 **GREY TO BLACK LIMESTONE**
- PERMIAN-TRIASSIC**  
 **SERPENTINE**
- KASLO GROUP**  
 **META-ANDESITE FLOWS, TUFF, BRECCIA**
- MISSISSIPPIAN MILFORD GROUP**  
 **GREY AND BROWN PHYLLITE AND META-SANDSTONE**
- CAMBRIAN TO DEVONIAN LARDEAU GROUP**  
 **GREY AND GREEN PHYLLITIC GRIT AND PHYLLITE**

### SYMBOLS

-  **LITHOLOGIC CONTACT**  
 **FAULT**  
 **DRAINAGE**  
 **APPROXIMATE CLAIM BOUNDARY**

EXCELLON RESOURCES INC.  
**REGIONAL GEOLOGY**  
**KANE CREEK PROPERTY**  
 SLOCAN MINING DIVISION, B.C. NTS 82K/3W, 3E

GEOLOGY AFTER P.B. READ, G.S.C. O.F. 432, 1976



**PROPERTY**

Sediments of the Slocan Group underlie the entire property. The dominant lithologies are fine-grained dark grey to black slates and argillites, however, limestone is exposed at a few localities and volcanics underlie the northern part of the claims.

On the MJM claim a medium to fine-grained feldspar porphyry intrudes the Slocan sediments. Petrographic examination (Appendix C) of this material reveals stumpy plagioclase crystals set in a fine-grained matrix of quartz, K-feldspar, biotite and hornblende. Compositionally the intrusive is a granodiorite. White quartz veins of various attitudes are common in the intrusive. The dominant vein structure - the 'Main Vein' - trends north-northeast dipping at approximately 45 degrees to the east. A distinct bleached alteration zone occurs on the footwall to the Main Vein. Examination of the altered wallrock indicates that it may in fact be a separate intrusive phase. Locally this material is brecciated and mineralized with galena, pyrite, lead-sulphosalts and sphalerite.

## MINERALIZATION

The 'Main Vein' (Figures 4, 5 and Plate 2) on the Kane Creek property is fault-fissure in nature and attributes its control to a northeasterly system of steep joints. The vein consists of milky white quartz. The thickness varies up to 30 centimeters over a strike length of 60 meters. Several trenches were drilled and blasted in exposures across the vein and footwall during the course of the work program. Mineralization occurs in what appear to be small shoots of galena and tetrahedrite. Sphalerite, pyrite and secondary Pb minerals are minor constituents. The nature and setting of the mineralization suggests that the Main Vein is similar to other economically important Ag-Pb-Zn deposits in the Slocan mining camp (Read, 1976A). A deposit model for the camp has been suggested by Sangster (1984).

A light coloured zone occurs on the footwall to the Main Vein. This material may represent alteration of the host feldspar porphyry, that is, silicification. However, petrographic analysis suggests that it may in fact be a separate intrusive - a diorite. This zone is also locally brecciated and mineralized. Galena, pyrite and a lead sulphosalt - possibly geocronite - are the main constituents. Tetrahedrite, sphalerite and gold or electrum are minor components. Samples of this material assay up to 0.182 oz/t Au, 13.32 oz/t Ag, 5.89% Pb, and

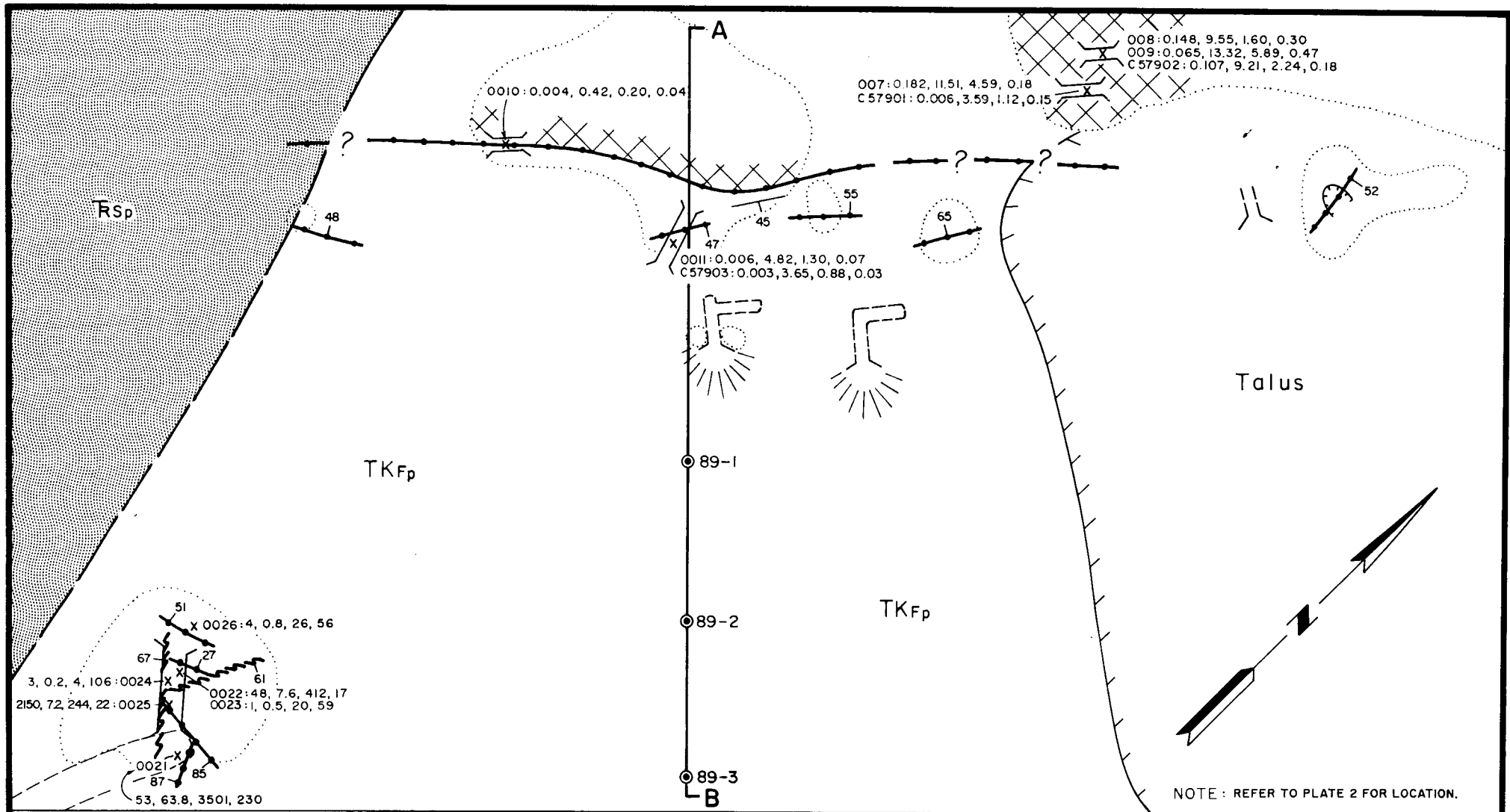


0.47% Zn. The variation in the tetrahedrite content between vein and altered zone indicates either a variation in chemistry during deposition or possibly a different genesis for each zone. Furthermore, the results of the petrographic examination, suggest there is a similarity between the so-called 'altered zone' at the Main Vein on the MJM claim and the precious metal-bearing breccias associated with the porphyry system on the Willa property (Sillitoe, 1988). Assay results of samples taken in the area of the Main Vein are tabulated below.

Table 2. Assay Data

Sample Number	Au oz/ton	Ag oz/ton	Pb %	Zn %	Width	Sampler
Main Vein						
0010	0.004	0.42	0.20	0.04	Grab	C.G. Verley
0011	0.006	4.82	1.30	0.07	30cm	C.G. Verley
C57903	0.003	3.65	0.88	0.03		P.A. Christopher
Altered Zone						
007	0.182	11.51	4.59	0.18	50cm	C.G. Verley
008	0.148	9.55	1.60	0.30	1.6m	C.G. Verley
009	0.065	13.32	5.89	0.47	Grab	C.G. Verley
C57901	0.006	3.59	1.12	0.15		P.A. Christopher
C57902	0.107	9.21	2.24	0.18		P.A. Christopher

In addition, trenching 70 meters south of the Main Vein area exposed mineralization in several veins trending at various attitudes. Chip samples across mineralized quartz veins exposed in the trench analyse up to 2150 ppb Au, 63.8 ppm Ag, 3501 ppm Pb and 230 ppm Zn.



## LEGEND

### LITHOLOGIES

TERTIARY-CRETACEOUS

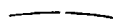
TKFp FELDSPAR PORPHYRY

TRIASSIC  
SLOCAN GROUP

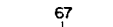
RSp PHYLLITE, ARGILLITE



APPROXIMATE OUTCROP DISTRIBUTION



INFERRED LITHOLOGIC CONTACT



FAULT



VEIN



ALTERED ZONE



ADIT



TRENCH

## SYMBOLS



PROSPECT PIT



DUMP



ROAD/TRAIL



PROPOSED DIAMOND DRILL HOLE



C 57902: Au Oz/T, Ag Oz/T, Pb%, Zn%  
0007  
ROCK SAMPLE LOCATION WITH  
SAMPLE NUMBER AND ASSAYS

0021: 26

Au in ppb, Ag, Pb, Zn in ppm

EXCELLON RESOURCES INC.

## SAMPLE LOCATION PLAN MAIN VEIN-DETAIL AREA 2

KANE CREEK PROPERTY

SLOCAN MINING DIVISION, B.C. NTS 82K/3W, 3E

0 10 20 metres

FIGURE 4

LOOKING NORTHEAST

A

B

ELEVATION  
IN METRES  
(A.S.L.)

LEGEND

LITHOLOGIES

TERTIARY-CRETACEOUS

TKFp FELDSPAR PORPHYRY

SYMBOLS

- MAIN VEIN
- ▧ FOOTWALL ALTERATION
- └┐ TRENCH
- └┐ ADIT
- PROPOSED 1989 DIAMOND DRILL HOLE

NOTE:

REFER TO FIGURE 4 FOR LOCATION  
OF SECTION LINE.

EXCELLON RESOURCES INC.

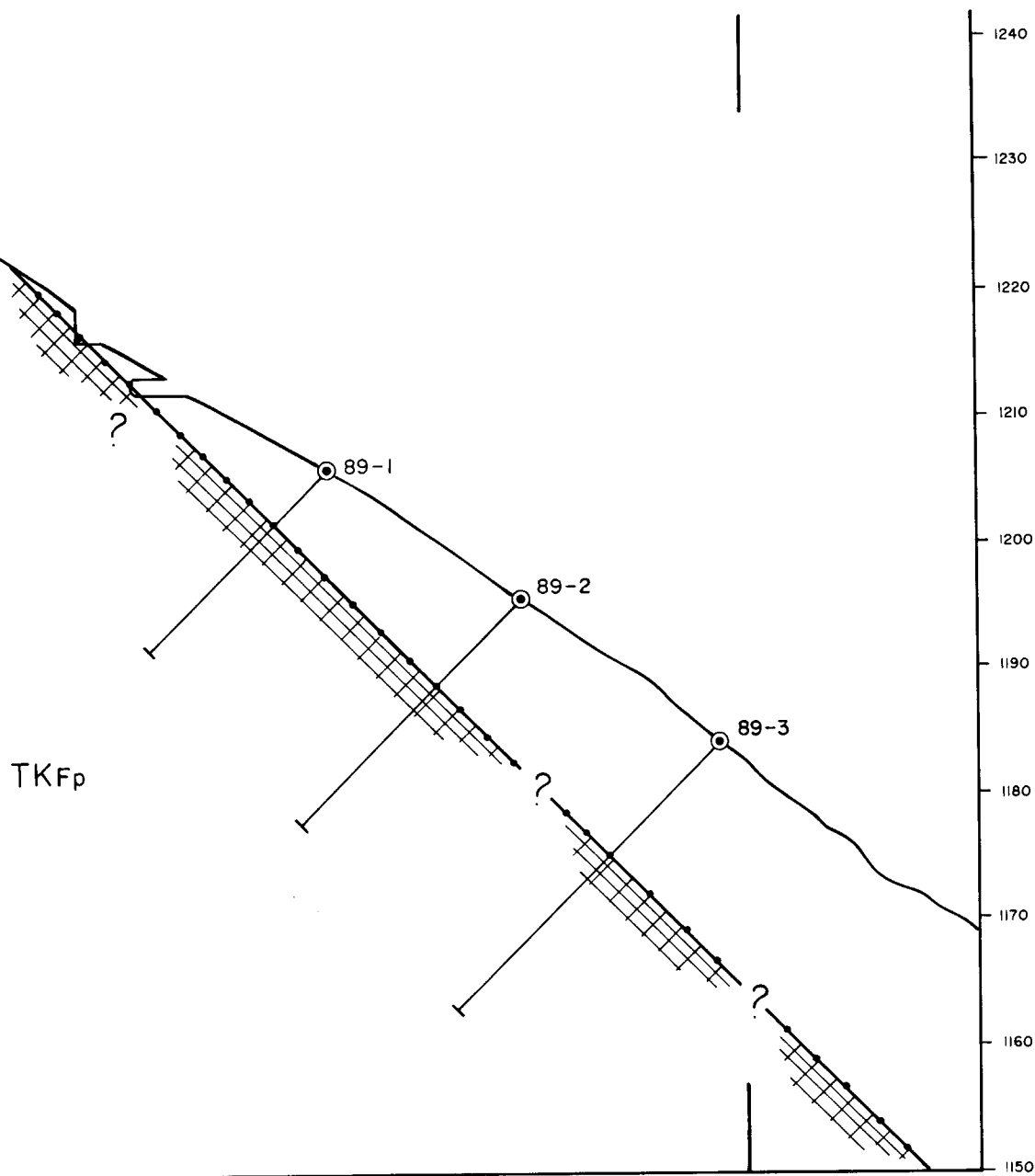
STRUCTURAL  
CROSS-SECTION

KANE CREEK PROPERTY

SLOCAN MINING DIVISION, B.C. NTS 82K/3W, 3E



FIGURE 5



### GEOCHEMISTRY

During the 1988 field program a total of 17 rock, 5 stream silt and 55 soil and/or talus fine samples were collected in the area of the MJM claim on the eastern side of the property. The object of this work was to test the ground for both precious and base metals.

Rock samples of material suspected to be mineralized were collected and sent in for analysis or assay if sulphides were observed. Stream silt samples were collected from creeks draining easterly into Kane Creek. Soil and/or talus fines were collected along lines at designated contour intervals, with sample spacing at 50 meters. All sample sites were flagged and labelled. Samples were placed in numbered bags and delivered to ACME Analytical Laboratories Ltd. in Vancouver, B.C. There rock samples were crushed, then pulverized to -100 mesh. Soils and stream silts were dried, then sieved to -80 mesh. The pulverized and sieved samples were digested in 3 ML of a 3:1:2 solution of HCl, HNO<sub>3</sub> and H<sub>2</sub>O at 95<sup>0</sup>C for one hour, then diluted with water to a 10 ML solution. Gold analysis was by atomic absorption from a 10 gram sample. Inductively coupled argon plasma(ICP) technique was used to analyse 0.5 grams samples for Mo, Cu, Pb, Zn, Ag, Ni, Co, Mn, Fe, As, U, Th, Sr, Cd, Sb, Bi, V, Ca, P, La, Cr, Mg, Ba, Al, Na, K, and W.

Rock, stream silt and soil sample results are discussed separately below.

#### ROCK

Rock sampling was restricted to the collection of specimens that either contained visible sulphide mineralization or were suspected to contain anomalous concentrations of metals. The results of this work are described under the section: 'Mineralization'.

#### STREAM SILT

A total of five silt samples were collected from four streams draining easterly into Kane Creek (Plate 1). Samples VMS 001, 002, and 003 were collected in an area draining a Mo-Cu-W anomaly outlined by Amoco Canada Petroleum Co Ltd. Values range up to 12 ppb Au, 58 ppm Pb and 30 ppm Mo. Samples VMS 004 and 005 are from a creek near the 'Main Vein' area. These samples are geochemically similar to one another but differ from those samples mentioned above, possibly indicating a different mineralizing source.

#### SOILS

A total of 55 contour soil samples were collected at various elevations over an area underlain primarily by meta-sediments of the Slocan Group on the eastern side of the property. A summary and interpretation of the geochemical data, in terms of range, background, possibly anomalous and anomalous

categories is tabulated below (Table 3.). A discussion of the results follows.

Table 3. Summary and Interpretation of Soil Geochemical Data

	Range	Background*	Possibly Anomalous*	Anomalous*
Au	1 - 230ppb	1 - 9ppb	10 - 15ppb	16+ ppb
Ag	0.1 - 7.7ppm	0.1 - 2.4ppm	2.5 - 2.9ppm	3.0+ ppm
Pb	11 - 238ppm	11 - 39ppm	40 - 59ppm	60+ ppm
Zn	62 - 1205ppm	62 - 499ppm	500 - 599ppm	600+ ppm
Cu	18 - 167ppm	18 - 99ppm	100 - 149ppm	150+ ppm
Mo	1 - 78ppm	1 - 14ppm	15 - 19ppm	20+ ppm

\*Visual estimate.

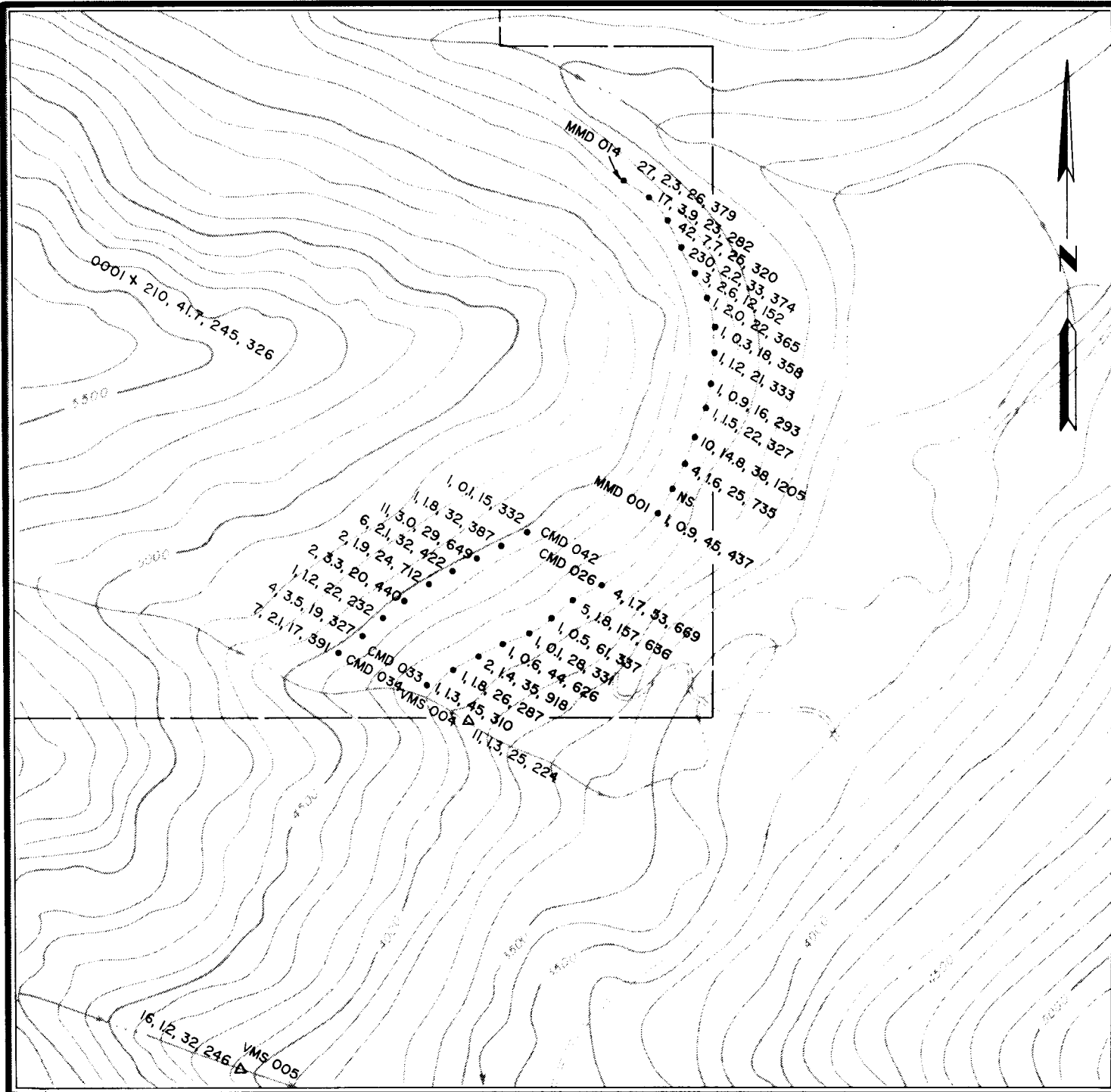
Three multi-element anomalous zones have been outlined by soil geochemistry. The first zone, represented by samples MMD 11-14 (Figure 6 and Plate 1), is anomalous in gold (up to 230ppb), silver (up to 7.7ppm), copper (up to 167ppm) and molybdenum (up to 26ppm). It may reflect the extension of an irregular quartz vein located upslope and to the west which contains tetrahedrite(sample 0001).

The second zone, outlined by samples CMD 26-31 (Figure 6 and Plate 1), which occurs upslope in the area of the Main Vein is anomalous or possibly anomalous in lead (up to 157ppm) and zinc (up to 918ppm). The source may be material similar to that found at the Main Vein. In addition, there are three samples (CMD 35, 37 and 40) located upslope of the second zone that are anomalous in silver (up to 3.5ppm).

The third zone (CMD 1-24, Figure 7) is characterized by high molybdenum values (to 78 ppm) with a number of samples

either anomalous or possibly anomalous in gold (10 values; 10-33ppb), silver (3 values; 3.0-5.2ppm), lead (7 values; 41-59ppm), copper (3 values; 102 and 156ppm) and zinc (3 values; 566 to 632ppm). This area was previously recognized as being anomalous in molybdenum by Amoco Canada Petroleum Co. Ltd. (Melnyk, 1979). Float of Slocan Group sediments in the area around the anomaly is cut by a stockwork of quartz veinlets. In addition, felsite float and an exposure of a felsite dyke suggests there is excellent potential for finding a precious metal-bearing porphyry deposit at this locality.

All three of the above zones warrant further work in order to delineate their sizes and sources.



# LEGEND

## SYMBOLS

### SAMPLE TYPE AND NUMBER

- VMS 001 Δ SILT
- CMD 034 • SOIL
- MMD 001
- 0001 x ROCK

### SAMPLE SITE

- Au, Ag, Pb, Zn
- Au IN ppb, Ag, Pb, Zn IN ppm

— APPROXIMATE CLAIM BOUNDARY

== ROAD/TRAIL

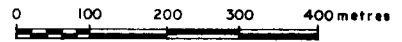
NOTE:  
REFER TO PLATE I FOR LOCATION

EXCELLON RESOURCES INC.

## GEOCHEMISTRY DETAIL AREA 3

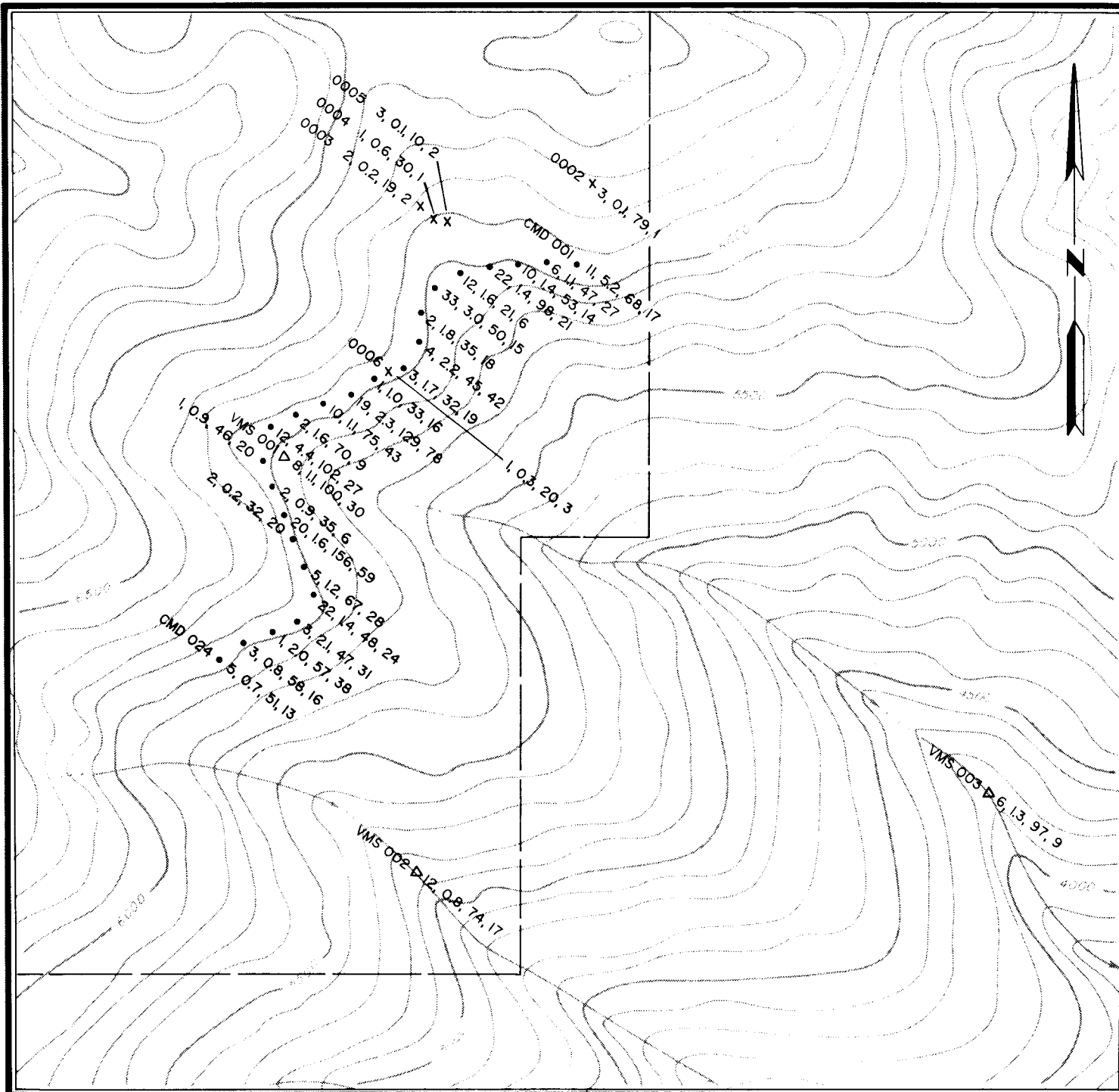
KANE CREEK PROPERTY

SLOCAN MINING DIVISION, B.C. NTS 82K/3W,3E



SCALE 1:10,000 FIGURE 6





# LEGEND

## SYMBOLS

### SAMPLE TYPE AND NUMBER

VMS 001 Δ SILT

CMD 025 • SOIL

0003 x ROCK

### SAMPLE SITE

• Au, Ag, Cu, Mo

Au IN ppb, Ag, Cu, Mo IN ppm

— APPROXIMATE CLAIM BOUNDARY

### NOTE:

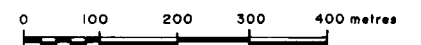
REFER TO PLATE 1 FOR LOCATION

EXCELLON RESOURCES INC.

GEOCHEMISTRY  
DETAIL AREA 4

KANE CREEK PROPERTY

SLOCAN MINING DIVISION, B.C. NTS 82K/3W, 3E



SCALE 1:10,000

FIGURE 7

## AIR PHOTOGRAPHY

Black and white air photographs of the property were obtained from the B.C. Government. The table below lists the flight and photograph numbers, altitude and the year in which the pictures were taken.

Table 4. Air Photograph Data

Flight No.*	Photo No.	Altitude (ASL)	Year
BC 80118	293-297	7920-8680M	1980
BC 7854	182-185	8230M	1976
BC 7854	196-203	8230M	1976
BC 7854	257-264	8230M	1976
BC 4371	137-147	5860M	1961-1965
BC 4379	209-216	5860M	1961-1965
BC 4383	45-50	5860M	1961-1965

\*All flight lines were flown in an east-west direction.

Examination of the photographs reveals that a number of lineaments trend in various directions across the property. Two large linears that trend northeasterly along the same strike line may indicate a major structural break.

Thick vegetation and extensive overburden makes it difficult to distinguish different lithologies from the air photographs.

## CONCLUSIONS

Excellon Resources Inc. has an option on the MJM and MLD 9 - 13 mineral claims located in the Kane Creek area, Slocan Mining Division, B.C. The ground is situated 12 kilometres northeast of New Denver and is accessible by road.

The property is underlain by a sequence of Triassic to Lower Jurassic meta-sediments and volcanics of the Slocan Group. A number of feldspar porphyries intrude the succession. Gold-silver-lead-zinc mineralization is associated with the intrusives in quartz veins.

Limited soil geochemistry has outlined three anomalous areas on the property. Follow-up of these areas and further sampling is warranted.

The claims have excellent potential for hosting Au-Ag-Pb-Zn vein type deposits similar to many other deposits in the Slocan mining camp, as well there is evidence indicating a precious metal-bearing porphyry deposit may be situated on the claims. A program of further exploration is strongly recommended.

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**APPENDIX A**  
**ESTIMATED COST OF RECOMMENDED PROGRAM**

Estimated Cost of Recommended Exploration Program  
Kane Creek Property, Slocan Mining Division, B.C.

## Stage I

## Salaries:

Project manager, 12 days @ \$350/day	\$4,200.00	
Geologist, 38 days @ \$300/day	11,400.00	
Field Assistant, 20 days @ \$250/day	5,000.00	\$20,600.00

## Assay and Analytical Costs

Soils - 1000 samples		
Au + 30 elem. ICP @ \$13.75/sample	13,750.00	
Rocks - 100 samples		
Au, Ag, Pb, Zn assay @ \$16.00/sample	1,600.00	15,350.00

## Geophysics:

I.P. 4 days @ \$1,000/day	4,000.00	
Mob/demob	1,000.00	5,000.00

## Diamond Drilling:

1,000 ft BQWL @ \$20/ft	20,000.00	
Mob/demob	2,000.00	
Moves	1,000.00	
Core boxes & mud	2,500.00	
Bulldozer rental(D-7)	3,000.00	28,500.00

## Field Expense:

Equipment	5,000.00	
Food	2,200.00	
Freight	750.00	
Fuel	600.00	
Lodging	2,500.00	
Telephone	200.00	
Travel	600.00	
Truck rental, 30 days @ \$100/day	3,000.00	14,850.00

## Helicopter support:

Bell 206, 12 hours @ \$625/hr		7,500.00
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Subtotal		91,800.00
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Contingency		8,200.00
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Total Estimated Cost of Stage I		<u>\$100,000.00</u>
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Stage II:

5,000 feet of diamond drilling for detailed evaluation of mineralization located in Stage I.

Total estimated all-in-cost of Stage II                   \$200,000.00

TOTAL ESTIMATED COST OF STAGE I and II                   \$300,000.00

**APPENDIX B**  
**ASSAY AND ANALYTICAL DATA**



## ASSAY AND ANALYTICAL DATA

## SAMPLE DESCRIPTIONS

Sample	Description
0001	Chips across 1 metre wide section of 1.5 metre wide irregular quartz vein containing disseminated tetrahedrite
0002	Chips across 15 cm wide limonitic zone.
0003	Chips from float boulder of sediment containing stockwork of quartz stringers.
0004	as 0003.
0005	Chips from float boulder of felsite with rusty quartz stringer.
0006	Chips from float boulder of bleached and veined limonitic sediment.
0007	Continuous chip sample across 50 cm wide section of bleached footwall alteration zone.
0008	Chip sample across 1.6 metre section of bleached footwall alteration to Main Vein.
0009	Chips from boulder of bleached footwall alteration to Main Vein.
0010	Chips from boulders blasted out of trench across Main Vein.
0011	Chips across 30 cm wide section of Main Vein.
0021	Chips across intrusive hosted quartz vein containing pyrite and minor galena.
0022	Chips across bleached intrusive hosted quartz vein containing pockets of pyrite.
0023	Chip sample of bleached, silicified intrusive adjacent to sample 0022.
0024	Chip sample of feldspar porphyry intrusive.
0025	Chips across intrusive hosted quartz vein containing pyrite and limonite.

0026 Chips across intrusive hosted quartz vein containing  
minor pyrite

Samples collected by Dr. P.A. Christopher:

C57901 check sample across sample site 0007

C57902 check sample across sample site 0008

C57903 check sample across sample site 0011

KANE CREEK PROPERTY  
SOIL GEOCHEMISTRY

	Au	Ag	As	Cu	Pb	Zn	Cd	Ba	Mn	Fe	Mo	Sb	Bi	W	U	Th	Sr	Ni	Co	Cr	V	La	B	Ca	Na	K	Al	Mg	P	Ti
	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	%	%	%	%	%	%
(File 88-6138)																														
CMD-001	11	5.2	34	68	42	155	1	76	144	5.59	17	6	2	1	5	8	17	44	9	23	25	11	2	0.06	0.01	0.04	4.72	0.22	0.164	0.05
CMD-002	6	1.1	33	47	26	240	1	76	196	5.11	27	11	5	1	5	5	11	44	10	22	48	17	3	0.02	0.01	0.06	2.19	0.21	0.082	0.02
CMD-003	10	1.4	33	53	29	239	1	119	334	5.25	14	2	5	1	5	4	11	54	15	24	38	13	2	0.04	0.01	0.05	2.87	0.29	0.120	0.04
CMD-004	22	1.4	74	98	31	307	1	65	882	6.80	21	5	4	1	5	4	6	57	16	14	24	11	2	0.03	0.01	0.04	1.60	0.19	0.133	0.01
CMD-005	12	1.6	15	21	16	62	1	32	80	2.82	6	3	5	1	5	4	5	10	5	11	29	7	2	0.02	0.01	0.03	2.75	0.07	0.058	0.05
CMD-006	33	3.0	54	50	29	275	3	100	210	5.76	15	5	2	1	5	6	18	82	11	27	20	12	2	0.09	0.01	0.04	2.14	0.27	0.100	0.01
CMD-007	2	1.8	37	35	22	212	2	70	221	4.35	18	6	4	1	5	5	14	25	6	15	34	7	2	0.11	0.01	0.04	4.06	0.10	0.247	0.03
CMD-008	4	2.2	52	45	24	284	1	88	93	4.58	42	14	2	1	5	3	8	38	8	10	45	9	2	0.03	0.01	0.04	1.73	0.05	0.081	0.01
CMD-009	3	1.7	23	32	19	169	1	66	142	2.98	19	3	4	1	5	4	5	24	7	11	40	13	3	0.02	0.01	0.03	1.91	0.08	0.041	0.02
CMD-010	1	1.0	21	33	11	206	2	105	601	2.97	16	2	2	1	5	1	13	36	10	10	25	12	2	0.08	0.01	0.04	0.98	0.10	0.065	0.01
CMD-011	19	2.3	99	129	41	566	3	133	813	5.93	78	22	2	1	5	3	9	127	23	12	57	16	2	0.03	0.01	0.07	1.74	0.07	0.089	0.01
CMD-012	10	1.1	61	75	27	328	1	108	737	4.66	43	12	2	1	5	3	7	79	17	13	39	19	2	0.02	0.01	0.06	1.44	0.21	0.061	0.01
CMD-013	2	1.6	29	70	42	317	3	127	2746	4.54	9	2	5	1	5	1	21	66	21	14	21	14	2	0.15	0.01	0.07	1.76	0.20	0.190	0.01
CMD-014	12	4.4	69	102	38	614	3	57	2677	5.59	27	13	2	1	5	2	10	121	33	14	18	15	2	0.08	0.01	0.04	1.25	0.20	0.202	0.01
CMD-015	1	0.9	51	46	28	261	1	61	2183	4.86	20	2	2	1	5	1	6	45	13	12	32	14	2	0.01	0.01	0.05	1.15	0.11	0.179	0.01
CMD-016	2	0.9	12	35	50	75	1	60	301	4.14	6	2	3	1	5	1	8	17	6	18	30	18	3	0.03	0.01	0.04	2.08	0.16	0.101	0.03
CMD-017	20	1.6	50	156	50	632	2	57	437	6.89	59	11	2	1	5	5	8	107	16	15	27	15	2	0.06	0.01	0.04	2.20	0.19	0.146	0.01
CMD-018	2	0.2	22	32	12	153	1	32	217	3.02	20	2	2	1	5	1	10	28	6	6	32	24	3	0.01	0.01	0.03	0.58	0.03	0.055	0.01
CMD-019	5	1.2	32	67	35	344	1	66	264	5.01	28	2	2	1	5	3	8	64	10	10	23	21	2	0.01	0.01	0.05	1.35	0.12	0.118	0.01
CMD-020	22	1.4	34	48	21	221	1	68	173	6.21	24	2	2	1	5	5	9	39	9	17	45	24	2	0.01	0.01	0.05	1.96	0.23	0.119	0.01
CMD-021	3	2.1	26	47	56	187	1	115	152	5.56	31	2	3	1	5	7	7	30	8	17	57	26	2	0.01	0.01	0.09	2.66	0.15	0.060	0.01
CMD-022	1	2.0	31	57	59	266	1	106	316	5.07	38	3	5	1	5	5	11	47	11	18	49	23	2	0.02	0.01	0.07	2.08	0.14	0.081	0.01
CMD-023	3	0.8	37	58	39	210	2	111	1154	4.62	16	2	2	1	5	3	13	43	12	19	31	28	2	0.03	0.01	0.08	1.90	0.26	0.176	0.01
CMD-024	5	0.7	27	51	29	217	1	92	782	3.96	13	2	2	1	5	4	8	49	11	15	29	20	2	0.02	0.01	0.05	1.61	0.24	0.064	0.01
CMD-025	1	0.9	36	54	27	174	1	67	661	4.19	10	3	5	1	5	3	8	49	13	18	26	20	2	0.03	0.01	0.05	1.33	0.25	0.095	0.01
CMD-026	4	1.7	82	53	53	669	2	149	1061	5.56	7	2	2	1	5	4	29	71	24	23	80	13	4	0.34	0.01	0.23	2.60	1.00	0.170	0.12
CMD-027	5	1.8	74	95	157	636	3	83	983	5.20	19	11	3	1	5	3	27	125	38	38	58	18	2	0.28	0.01	0.08	1.92	0.73	0.196	0.04
CMD-028	1	0.5	15	18	61	337	4	58	748	2.02	5	2	3	1	5	1	17	32	9	22	49	10	2	0.21	0.01	0.04	1.05	0.61	0.103	0.05
CMD-029	1	0.1	34	24	28	331	2	103	839	2.40	3	2	2	1	5	2	28	50	12	37	66	12	2	0.39	0.01	0.06	1.51	1.34	0.157	0.05
CMD-030	1	0.6	71	64	44	626	3	128	546	4.79	11	2	2	1	5	2	21	67	15	15	30	15	2	0.17	0.01	0.05	1.36	0.19	0.144	0.02
CMD-031	2	1.4	24	80	35	918	4	131	467	4.95	14	2	2	1	5	3	18	113	18	17	26	12	2	0.11	0.01	0.05	1.90	0.29	0.125	0.02
CMD-032	1	1.8	17	30	26	287	3	115	670	3.16	4	2	2	1	5	1	19	50	10	17	25	10	7	0.08	0.01	0.04	2.00	0.28	0.141	0.04
CMD-033	1	1.3	10	143	45	310	2	64	712	5.81	6	2	2	1	5	2	42	79	17	12	10	10	2	0.52	0.01	0.04	1.05	0.14	0.339	0.01
CMD-034	7	2.1	15	73	17	391	2	70	212	3.82	10	5	2	1	5	4	11	68	14	13	15	15	4	0.08	0.01	0.04	1.25	0.29	0.066	0.01
CMD-035	4	3.5	14	57	19	327	3	123	296	3.62	7	2	2	1	5	5	7	53	13	15	24	16	3	0.04	0.01	0.05	2.42	0.21	0.150	0.04
CMD-036	1	1.2	6	18	22	232	2	160	618	2.38	5	2	2	1	5	1	10	24	7	14	38	10	2	0.06	0.01	0.06	1.59	0.12	0.102	0.03
CMD-037	2	3.3	9	28	20	440	3	180	288	3.52	12	2	3	1	5	3	14	49	11	16	41	8	5	0.11	0.01	0.05	3.20	0.15	0.264	0.06
CMD-038	2	1.9	20	39	24	712	6	140	640	3.95	14	2	2	1	5	2	38	58	15	17	49	9	2	0.23	0.01	0.07	2.36	0.24	0.159	0.06
CMD-039	6	2.1	16	36	32	422	6	202	902	3.07	6	2	2	1	5	1	15	42	12	15	32	10	4	0.10	0.01	0.08	1.76	0.20	0.151	0.03
CMD-040	11	3.0	28	141	29	649	7	123	330	5.64	18	6	2	1	5	7	23	84	17	14	19	18	2	0.08	0.01	0.06	1.15	0.25	0.118	0.01
CMD-041	1	1.8	10	37	22	387	3	122	332	3.30	8	2	2	1	5	3	10	38	9	14	32	13	5	0.06	0.01	0.06	1.42	0.14	0.099	0.03
CMD-042	1	1.1	2	23	15	332	2	205	821	2.27	4	2	3	1	5	3	14	26	9	15	40	10	2	0.11	0.01	0.06	1.60	0.16	0.101	0.05
HMD-001	1	0.9	6	42	45	437	5	124	738	2.96	5	2	2	1	5	2	43	45	13	10	28	9	2	0.39	0.01	0.07	1.23	0.19	0.050	0.03
HMD-003	4	1.6	35	37	25</																									

KANE CREEK PROPERTY  
ROCK GEOCHEMISTRY

	Au	Ag	As	Cu	Pb	Zn	Cd	Ba	Mn	Fe	Mo	Sb	Bi	W	U	Th	Sr	Ni	Co	Cr	V	La	B	Ca	Na	K	Al	Mg	P	Ti
	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	%	%	%	%	%	%
(File 88-6138)																														
0001	210	41.7	127	1048	245	326	2	141	732	2.62	3	552	2	1	5	2	417	35	9	14	7	5	2	5.55	0.01	0.08	0.20	1.94	0.022	0.01
0002	3	0.1	96	79	10	131	1	190	2304	9.36	1	2	2	1	5	7	76	515	61	214	40	38	2	0.62	0.03	0.19	2.47	1.31	0.297	0.01
0003	2	0.2	26	19	10	27	1	25	88	1.58	2	2	2	1	5	5	9	29	4	17	8	15	4	0.10	0.01	0.05	0.94	0.72	0.033	0.01
0004	1	0.6	3	30	18	98	1	36	266	4.35	1	4	2	1	5	6	9	31	11	25	15	13	2	0.05	0.01	0.06	1.94	0.93	0.021	0.01
0005	3	0.1	16	10	13	69	1	91	305	0.99	2	2	2	1	5	2	15	14	2	6	1	4	2	0.06	0.03	0.09	0.24	0.02	0.013	0.01
0006	1	0.3	14	20	20	77	1	38	164	3.50	3	2	2	1	5	6	9	27	5	14	12	16	2	0.01	0.01	0.06	1.34	0.58	0.020	0.01
0021	53	63.8	23	12	3501	230	1	17	143	4.45	3	2	125	1	5	1	37	6	8	6	7	2	2	0.03	0.01	0.04	0.16	0.06	0.022	0.01
0022	48	7.6	41	24	412	17	1	12	208	5.02	2	4	6	2	5	1	139	11	14	6	2	2	2	1.28	0.01	0.03	0.06	0.18	0.021	0.01
0023	1	0.5	9	15	20	59	1	100	627	3.14	1	2	2	1	5	3	292	7	8	6	33	7	4	3.41	0.02	0.26	1.08	0.85	0.084	0.03
0024	3	0.2	15	16	4	106	1	153	593	3.87	1	2	2	1	5	2	71	10	11	12	91	7	4	0.74	0.02	0.61	2.44	1.26	0.109	0.11
0025	2150	7.2	174	10	244	22	1	23	258	4.71	3	2	2	2	5	1	17	8	9	5	3	2	2	0.10	0.01	0.05	0.24	0.06	0.037	0.01
0026	4	0.8	24	10	26	56	1	30	231	1.18	3	2	2	2	5	1	16	8	3	7	3	2	3	0.26	0.01	0.05	0.10	0.01	0.028	0.01

	Au	Ag	As	Cu	Pb	Zn	Cd	Ba	Mn	Fe	Mo	Sb	Bi	W	U	Th	Sr	Ni	Co	Cr	V	La	B	Ca	Na	K	Al	Mg	P	Ti
	OZ/T	OZ/T	ppm	ppm	%	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	%	%	%	%	%	%
(File 88-6138)																														
0007	0.182	11.51	252	320	4.59	0.18	30	35	487	3.58	1	6765	2	1	5	3	78	3	7	4	5	4	2	0.36	0.02	0.09	0.25	0.09	0.061	0.01
0008	0.148	9.55	228	640	1.60	0.30	36	39	570	3.49	1	4192	2	1	5	2	145	5	7	2	6	3	2	1.25	0.02	0.10	0.23	0.26	0.060	0.01
0009	0.065	13.32	218	563	5.89	0.47	61	42	442	4.04	1	2209	2	1	5	3	109	5	8	5	5	3	2	0.66	0.02	0.10	0.23	0.18	0.065	0.01
0010	0.004	0.42	148	56	0.20	0.04	5	26	225	2.36	1	39	2	1	5	2	78	4	5	3	3	4	5	0.49	0.03	0.06	0.15	0.15	0.037	0.01
0011	0.006	4.82	93	73	1.30	0.07	9	37	65	1.75	1	136	3	6	5	2	26	2	2	6	3	3	3	0.09	0.02	0.09	0.15	0.02	0.023	0.01
(File 88-5751)																														
c57901	0.006	3.59	291	75	1.12	0.15	11	68	687	4.08	1	268	2	1	5	2	51	11	10	56	9	6	19	0.28	0.03	0.17	0.38	0.06	0.076	0.01
c57902	0.107	9.21	320	596	2.24	0.18	19	47	608	3.09	2	6633	2	1	5	1	190	8	7	6	6	3	10	1.79	0.02	0.13	0.23	0.38	0.070	0.01
c57903	0.003	3.65	72	74	0.88	0.03	5	23	68	1.94	2	118	2	15	5	1	29	7	2	67	3	2	9	0.15	0.01	0.06	0.11	0.03	0.016	0.01

**APPENDIX C**  
**PETROGRAPHIC REPORT**



# Vancouver Petrographics Ltd.

JAMES VINNELL, Manager  
JOHN G. PAYNE, Ph.D. Geologist  
A.L. LITTLEJOHN, M.Sc. Geologist  
JEFF HARRIS, Ph.D. Geologist

P.O. BOX 39  
8887 NASH STREET  
FORT LANGLEY, B.C.  
VOX 1J0

PHONE (604) 888-1323

Report for: Carl G. Verley,  
Amerlin Exploration Services Ltd.,  
108-525 Seymour St.,  
Vancouver, B.C.  
V6B 3H7

Invoice 7874

January 9th, 1989

## Samples:

9 rock samples from the New Denver area, for sectioning and petrographic examination.

Samples are numbered as follows:

Suite 1  
# 003  
# 005  
Suite 2  
# 0100  
# 0101  
# 0102  
# 0103A  
# 0103B  
# 0104  
# 0105

Samples 003, 005 and 0101 were prepared as standard thin sections; the remainder are polished thin sections.

## Summary:

The two samples from the first area (003 and 005) are a siliceous wacke and a quartz-feldspar porphyry. The striped appearance of the wacke is caused by parallel quartz stringers with envelopes of host rock bleaching (expulsion of interstitial opaques); there is no evidence of hornfelsing.

In the other suite, Sample 0101 (described by you as unaltered feldspar porphyry) is a strongly epidotized granodiorite, and Sample 0102 (your 'altered feldspar porphyry') is a leucocratic diorite, or quartz diorite, with interstitial carbonate and disseminated pyrite. Neither rock is actually porphyritic, and they are clearly two compositionally different intrusives, both more or less altered.

The samples denoted as 'mineralized wallrock to vein 0105' (#s 0103A, 0103B and 0104) are of generally similar composition to 0102, but lack its substantial carbonate content. They appear strongly silicified, and more or less brecciated or granulated.

These three samples are mineralized with pockets and network impregnations of sulfides consisting of pyrite, galena and a Pb-Sb sulfosalt (possibly geocronite). Rare tiny specks of native Au or electrum, 10 - 30 microns in size, were seen in all three samples, always within pyrite.

Sample 0100 is a brecciated and silicified diorite similar to the above group, but essentially unmineralized.

Sample 0105 is a quartz vein mineralized by galena and tetrahedrite with minor pyrite. One example of minute specks of gold (2 - 10 microns) was seen, within the tetrahedrite. The abundance of tetrahedrite, and the absence of the Pb-Sb sulfosalt seen in the 'mineralized wallrock samples', is notable; it is possible that the two represent different mineralizing events.

Individual petrographic descriptions are attached. Also included is a set of photomicrographs illustrating the styles of mineralization.

A handwritten signature in cursive script, appearing to read 'J.F. Harris', written in dark ink.

J.F. Harris Ph.D.

(929-5867)

## PHOTOMICROGRAPHS

### SAMPLE 0103A

Neg. 143-18: Scale 1cm = 85 microns.

Shows pyrite (cream colour) surrounded by Pb-Sb sulfosalt (grey). Note somewhat feathery/bladed texture in the sulfosalt, made visible by pleochroism in shades of grey. Note also ragged margin of sulfosalt against fringe of dark grey alteration product (top). Field includes a small patch of tetrahedrite (slightly darker than the darkest grey of the sulfosalt; on the contact with pyrite, lower left centre).

Neg. 143-19: Scale 1cm = 42 microns.

Shows inclusions of Pb-Sb sulfosalt (grey) and tetrahedrite (slightly darker grey) in pyrite. Central inclusion has a small grain of intergrown native gold/electrum (yellow).

Neg. 143-20: Scale 1cm = 85 microns.

Shows pyrite aggregate cemented and marginally replaced by galena (bluish grey). Black areas are gangue.

### SAMPLE 0103B

Neg. 143-17: Scale 1cm = 42 microns.

Shows galena (blue-grey) as pockets and veinlets in pyrite. Galena includes minor intergrown tetrahedrite (slightly darker, olive grey). Small (30 micron) gold segregation extending into adjacent thread-like micro-fracture. Dark grey areas in galena are gangue and (e.g. speckled patch, lower left) secondary alteration.

### SAMPLE 0105

Neg. 143-22: Scale 1cm = 85 microns

Shows part of relict grain of pyrite (buff colour) enclosed within, and partially replaced by, galena (bluish grey with speckled tarnish). Darker, brownish-grey phase (major component as intergrown islands in the galena: e.g. lower left) is tetrahedrite. Minor darker blue-grey grains are accessory sphalerite.

Neg. 143-21: Scale 1cm = 42 microns.

Area of tetrahedrite (grey matrix) with inclusions of galena (lighter), sphalerite (darker grey) and gangue (darkest grey). Field includes a cluster of tiny (2 - 10 micron) gold grains (yellow; bottom right).



SAMPLE 003

SILICEOUS WACKE WITH QUARTZ STRINGERS

Estimated mode

Quartz	82
Plagioclase	14
Sericite	2
Chlorite	trace
Tourmaline	trace
Monazite	trace
Limonite	trace
Micron-sized opaques)	2
Carbonaceous material(?))	

This sample is a non-foliated, quartzose wacke, composed largely of close-packed, sub-angular quartz grains, 0.03 - 0.3mm in size. Plagioclase is an evenly distributed accessory, as scattered grains of similar size; it tends to be relatively more abundant in the finer size ranges, which pack between the coarser quartz clasts.

Other accessory constituents are minor. They consist of randomly oriented, tiny flecks of sericite and occasional chlorite. Rare, sporadically disseminated, individual grains of monazite (probably detrital) and tourmaline (probably diagenetic) are also seen.

Micron-sized opaques (possibly mainly of carbonaceous character) occur as a sparse, dusty/wispy, interstitial network phase, intergranular to the quartz and feldspar clasts.

The rock is traversed by a series of sub-parallel quartz stringers, 0.2 - 1.2mm in thickness, showing comb-structure transverse to their trend. These stringers show well-defined envelopes of bleaching (see cut-off block) up to 1 or 2mm in thickness. The only recognizable petrographic difference in the rock within these envelopes, vs the rest of the rock, is an essential lack of intergranular, dusty opaques.

The rock shows no evidence of hornfelsing. Primary clastic textures are perfectly preserved.

## SAMPLE 005

## FELDSPAR PORPHYRY

## Estimated mode

Quartz	17
Plagioclase	72
Sericite	10
Pyrite	trace
Limonite	1

This is a leucocratic porphyritic rock of simple composition.

Phenocrysts of plagioclase and minor quartz, 0.2 - 3.0mm in size, make up about 35% of the rock.

They are set in an even, saccharoidal-textured, microgranular groundmass of plagioclase and accessory quartz, of grain size 10 - 70 microns. The groundmass is evenly flecked with minute, randomly-oriented flakes of sericite.

The phenocrysts are of various forms. The commonest are subhedral prismatic, well-twinned plagioclase (composition oligoclase). A few euhedral quartz phenocrysts are seen, but the majority of the siliceous phenocrysts are in the nature of irregular clumps of anhedral microgranular quartz, sometimes with intergrown plagioclase.

A few of the plagioclase phenocrysts show a very mild dusting of sericite, but most are essentially fresh. Slightly coarser sericite occurs as wisps intergrown with, or rimming, some of the quartz/plagioclase phenocrystic clumps.

The total lack of mafic silicates is notable.

The rock contains disseminated limonite pseudomorphs, and limonite-stained cubic casts, 0.05- 0.5mm in size, probably derived from original, tiny, randomly disseminated pyrite grains.

The slide is cut by a few parallel veinlets, 0.5 - 2.0mm thick, of granular quartz. These veinlets sometimes contain included remnants of plagioclase phenocrysts, and appear to be in the nature of microfracture-controlled replacement zones rather than true fissure fillings.

SAMPLE 0100 MYLONITIZED SILICIFIED QUARTZ DIORITE(?)

Estimated mode

Quartz	66
Plagioclase	33
Sericite	trace
Pyrite	1

This is a rock of uncertain origin.

It is of simple composition - consisting essentially of quartz and plagioclase - but is texturally heterogenous.

Quartz occurs as more or less coherent veniform bodies and granular masses in all stages of brecciation and disaggregation. Much of the rock consists of apparent sub-angular to sub-rounded clasts of quartz, 0.1 - 1.0mm in size, set in a minutely fine-grained matrix, apparently composed largely of plagioclase (see etched cut-off block).

Plagioclase is also seen as occasional coarse prismatic grains or granular intergrowths with quartz. The coarser plagioclase grains are typically speckled with sericite.

This fabric has the aspect of a cataclasite (zone of brecciation and mylonitization) derived from a siliceous (possibly veined and silicified) diorite. It could be the brecciated contact zone of a vein.

The deformation appears to be in the nature of granulation and crushing rather than active shearing, as streaky and oriented elements are essentially absent from the fabric.

Fine-grained pyrite occurs as disseminated wisps on the contact of more massive zones (of vein quartz and of quartz diorite) at each end of the slide.

SAMPLE 0101

EPIDOTIZED GRANODIORITE

Estimated mode

Quartz	14
Plagioclase	18
K-feldspar	20
Sericite	4
Biotite	9
Hornblende	9
Chlorite	2
Epidote	23
Sphene)	1
Opagues)	

This rock exhibits the typical texture of a fine to medium-grained granitoid intrusive.

It consists essentially of an allotromorphic-granular intergrowth of plagioclase, K-feldspar (microcline), quartz, hornblende and biotite, in the grain size range 0.2 - 2.0mm. It shows extensive development of (secondary) epidote.

Plagioclase is both the most abundant and the coarsest constituent. An intergrowth of somewhat finer grained anhedral quartz and microcline, with subhedral biotite and hornblende, forms a matrix to abundant stumpy, sub-prismatic plagioclase grains.

The plagioclase is typically about 50% replaced by meshworks of finer-grained, elongate, prismatic epidote, plus minor flecks of sericite. Epidote also shows variably strong replacement of the mafic silicates, especially hornblende. The associated biotite locally shows interlaminar chloritization. Microcline is fresh.

Accessories are minor, consisting of randomly scattered, tiny euhedra of sphene and rare, equant opaques (pyrite or magnetite).

The rock has the composition of granodiorite. Other than the pervasive epidotization and its notably even grain, it shows no particularly remarkable features. It appears undeformed.

## SAMPLE 0102

## DIORITE

## Estimated mode

Quartz	10
Plagioclase	62
Sericite	12
Carbonate	13
Rutile	trace
Apatite	trace
Pyrite	3

This is another somewhat altered granitoid intrusive. It is slightly coarser grained than the previous sample, and is compositionally quite different.

It consists predominantly of plagioclase, as an anhedral to sub-prismatic aggregate of grain size 0.5 - 3.0mm.

Irregular pockets of finer anhedral granular quartz - often showing strong strain polarization - occur interstitially to the plagioclase aggregate.

The plagioclase shows rather even, pervasive sericitization, in the form of random meshworks of tiny mica flakes; on average it is about 20% replaced by sericite.

The rock contains no recognizable mafic minerals. It is, however, permeated by intergranular networks and small, irregular pockets of fine-grained carbonate - sometimes with associated muscovite flakes. This phase may represent the total alteration of original minor mafics, though no pseudomorphous forms are seen.

Pyrite is a notably abundant accessory, as subhedral grains 0.05 - 0.5mm in size, often forming semi-coalescent clusters. It occurs in close association with the interstitial carbonate, and may be largely a late-magmatic or deuteritic constituent.

## Estimated mode

Quartz	69
Plagioclase	14
Sericite	trace
Carbonate	trace
Pyrite	8
Galena	4
Pb-Sb sulfosalt	3
Electrum	trace
Secondary Sb mineral	1
Secondary Pb mineral)	1
Limonite)	

This sample is composed predominantly of quartz, as a varigranular aggregate of strongly strained, anhedral, often elongate grains, 0.1 - 5.0mm in size.

Scattered grains of plagioclase, comparable in size to the quartz, and sometimes lightly flecked with sericite, are sporadically intergrown. These may be a primary constituent in a somewhat pegmatitic quartz vein, or they may represent relict plagioclase in an intensely quartz-permeated and sheared/granulated dioritic host.

Carbonate occurs in trace proportions, as scattered, discrete pockets.

The rock contains sulfides, as clumpy disseminations and fine-grained intergranular pockets and networks in the quartz/plagioclase matrix.

Pyrite is the most abundant sulfide constituent, sometimes occurring as segregated clumps, or as clusters of tiny subhedra sparsely cemented by galena, or as included grains within pockets of dominant galena or a strongly anisotropic, somewhat fibrous-textured Pb-Sb sulfosalt mineral.

The latter (identified by SEM microanalysis as having  $Pb > Sb$  is possibly geocronite (the most Pb-rich of the Pb-Sb sulfosalts).

Minor tetrahedrite (shown by SEM to be an argentiferous variety) and traces of sphalerite are sometimes intergrown with galena or the Pb-Sb sulfosalt.

One minute (15 micron) speck of native gold or electrum was seen, as an inclusion (with associated tetrahedrite?) within a pyrite grain.

The Pb-Sb sulfosalt commonly shows fringes of a brown, sub-opaque, flaky secondary product. Galena is sometimes altered to pockets of colourless, high-relief anglesite. Limonite is present as minor flecks and diffuse intergranular staining in the quartz.

# SAMPLE 0103B MINERALIZED, SILICIFIED AND BRECCIATED DIORITE

## Estimated mode

Quartz	35
Plagioclase	50
Sericite	4
Carbonate	2
Pyrite	4
Galena	3
Pb-Sb sulfosalt	2
Sphalerite	trace
Tetrahedrite	trace
Electrum	trace
Limonite	trace

This sample is of closely similar type to 01013A, but has a much higher ratio of plagioclase to quartz. The origin of the rock is more clearly indicated as being a silicified (veined and irregularly quartz-permeated) diorite or quartz diorite.

The plagioclase grain size is in the range 0.5 - 3.0mm, and it occurs as anhedral to subhedral, prismatic grains, intergrown with quartz of a similar size range. The plagioclase crystals sometimes appear brecciated, and the quartz is strained and locally granulated. Partial preferred orientation related to cataclasis is locally developed.

The plagioclase is typically lightly flecked with sericite. Carbonate is a minor accessory, as sporadic pockets and networks in the quartz/feldspar aggregate.

The rock is mineralized in similar manner to 0103A. Pyrite occurs as disseminated, tiny, individual subhedra, and as inclusions in, or clumps cemented by, galena and a Pb-Sb sulfosalt (probably geocronite). The latter minerals form irregular pockets to 2mm or more in size, linked by network impregnations; these follow quartz and plagioclase grain boundaries, and fill fractures in brecciated crystals of those minerals.

Sphalerite and tetrahedrite are trace accessories.

Two specks of native gold (15 microns and 30 microns) were seen associated with tiny inclusions of galena in pyrite.

This sample shows noticeably less development of secondary alteration products compared with 0103A.

**SAMPLE 0104    SILICIFIED CRUSHED DIORITE, WITH SULFIDES**

Estimated mode

Quartz	47
Plagioclase	40
Sericite	3
Carbonate	2
Pyrite	5
Pb-Sb sulfosalt	2
Galena	1
Tetrahedrite	trace
Electrum	trace
Limonite)	trace
Secondary Sb mineral)	
Anglesite	trace

This sample is a rock of essentially identical - and, no doubt, similar origin - to 0103B.

Its character is readily revealed in the etched cut-off block as a feldspathic intrusive (quartz diorite?) irregularly and diffusely cemented by vein-type quartz. Plagioclase remnants (white-etched) often survive even within the strongly quartzose patches.

The plagioclase is sometimes lightly sericitized, and sericite also concentrates as local felted wisps. Accessory carbonate forms sporadic interstitial pockets in the quartz/feldspar aggregate.

The quartz is strongly strained and locally granulated, and the plagioclase shows local brecciation, partial crystallographic alignment, and sinuous deformation and partial crystallographic or fracture displacement of twin lamellae - all indicative of development in a regime of stress.

The mineralization is similar to that in the previous samples. It consists of disseminated pyrite, sometimes enveloped and extensively veined and replaced by galena, the Pb-Sb sulfosalt and minor tetrahedrite. The latter assemblage also forms irregular pockets and network impregnations independent of pyrite, on a scale of 0.2 - 2.0mm.

Very tiny (10 - 30 micron) specks of native gold were seen within pyrite.

The sulfides and sulfosalts show minor marginal alteration to secondary products.



**SAMPLE 0105 VEIN QUARTZ, WITH GALENA/TETRAHEDRITE MINERALIZATION**

Estimated mode

Quartz	72
Carbonate	trace
Sericite	trace
Galena	13
Tetrahedrite	13
Sphalerite	1
Pyrite	trace
Secondary Pb minerals	1

This sample is of distinctly different type to the previous mineralized rocks. It contains no plagioclase, and appears to be true vein quartz.

It is strongly mineralized, but with a markedly different assemblage to the altered wall-rock samples. Pyrite is virtually absent, and the Pb-Sb sulfosalt is not seen. Tetrahedrite, by comparison, is highly abundant.

The quartz matrix is predominantly coarse-grained, being an anhedral aggregate of grain size 1 - 5mm or more. Local intergranular development of finer mosaics is seen, and the coarse quartz grains show shadowy strain polarization and incipient microgranular recrystallization.

Rare traces of carbonate and sericite are seen as scattered flecks and wisps.

The sulfides occur as coarse interconnected pockets, up to several mm in size, grading to fine-grained network permeations (intergranular fillings and local replacements) of the quartz matrix.

The sulfide pockets consist of galena and tetrahedrite in simple, emulsion-type or archipelago intergrowth, on the scale 0.1 - 1.5mm.

Sphalerite is a minor accessory, as scattered, small grains within, and marginal to, the galena/tetrahedrite. Pyrite occurs as occasional, individual, strongly core-replaced remnants within the galena/tetrahedrite, and as sparse, small euhedra in quartz.

The galena shows a tendency to tarnish rapidly, which may be indicative of argentiferous character. Marginal alteration to transparent and sub-opaque secondary products (probably mainly anglesite) is fairly common.

No gold was seen in this sample.

**APPENDIX D**  
**STATEMENT OF EXPENDITURES**

## STATEMENT OF EXPENDITURES

Personnel	MJM	MLD 9
C.G. Verley, project supervisor, 16 days @ \$375/day. . .	\$5,300.00	700.00
S.P. Williams, geologist, 45 days @ \$275/day. . .	12,100.00	275.00
J. Clark, field assistant, 16 days @ \$225/day. . .	3,150.00	450.00
L. Merrifield, 8 days @ \$225/day . .	1,800.00	
 Expenses		
Assay and analysis. . . . .	.749.74	329.86
Drafting. . . . .	3,467.30	300.00
Engineering . . . . .	1,284.31	
Excavating. . . . .	3,368.88	
Field supplies. . . . .	8,317.70	100.00
Food. . . . .	1,153.40	50.00
Fuel. . . . .	.240.46	
Helicopter charter. . . . .		1,758.00
Hotel . . . . .	1,143.12	60.00
Petrography . . . . .	.730.45	200.00
Telephone . . . . .	.236.50	
Trenching . . . . .	10,375.00	
Travel. . . . .	.177.10	
Vehicle rental. . . . .	4,200.00	400.00
Total. . . . .	<u>\$57,793.96</u>	<u>\$4,622.86</u>

The above costs were incurred in carrying out the work program described in the attached report.

*Carl G. Verley.*

Carl G. Verley, F.G.A.C.

**APPENDIX E**  
**CERTIFICATES**

# AMERLIN EXPLORATION SERVICES LTD.

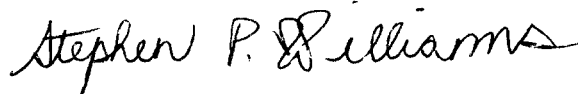
108-525 Seymour Street, Vancouver, B.C., Canada, V6B 3H7 Phone (604) 689-1868

## WRITER'S CERTIFICATE

I, Stephen P. Williams of Vancouver, British Columbia hereby certify that:

1. I am a geologist residing at 1191 West 40th Avenue, Vancouver B.C.
2. I am a graduate of the University of British Columbia, B.Sc. in 1984, and have practised my profession since 1987.
3. I am the author of this report which is based on work conducted by me on the MJM and MLD 9 - 13 mineral claims during the period October 27 to November 21, 1988.

Amerlin Exploration Services Ltd.



Stephen P. Williams, B.Sc

February 24, 1989  
Vancouver, B.C.

# AMERLIN EXPLORATION SERVICES LTD.

108-525 Seymour Street, Vancouver, B.C., Canada, V6B 3H7 Phone (604) 689-1868

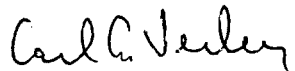
## SUPERVISOR'S CERTIFICATE

I, Carl G. Verley of Vancouver, British Columbia

hereby certify that:

1. I am a geologist residing at 8191 Osler Street, Vancouver B.C.
2. I am a graduate of the University of British Columbia, B.Sc. in 1974, and have practised my profession since that time.
3. I am a Fellow of the Geological Association of Canada.
4. I supervised the work program conducted on the MJM and MLD 9-13 claims during the period October 27 to November 21, 1988.

Amerlin Exploration Services Ltd.



Carl G. Verley, F.G.A.C.

February 24, 1989.  
Vancouver, B.C.





**LEGEND**  
**LITHOLOGIES**

- TERTIARY-CRETACEOUS**  
 FELDSPAR PORPHYRY
- TRIASSIC SLOCAN GROUP**  
 GREY TO BLACK PHYLLITE, ARGILLITE, QUARTZITE  
 GREY TO BLACK LIMESTONE
- PERMIAN KASLO GROUP**  
 META-ANDESITE FLOWS, TUFF, BRECCIA

**SYMBOLS**

- APPROXIMATE OUTCROP DISTRIBUTION
- LITHOLOGIC CONTACT (KNOWN, INFERRED)
- VEIN
- BEDDING
- FOLIATION
- FOLD AXIS
- ROAD
- APPROXIMATE CLAM BOUNDARY
- HELICOPTER PAD
- SILT SAMPLE
- SOIL SAMPLE
- ROCK SAMPLE
- AIRPHOTO LINEAMENTS

**NOTE:**  
 GEOLOGY MODIFIED AFTER P.B. READ, G.S.C. D.F. 432, 1976  
 CONTOUR INTERVAL 100 FEET  
 TOPOGRAPHY FROM DEPT. OF ENERGY, MINES AND RESOURCES,  
 NTS 82K/3, ROSEBERY SHEET

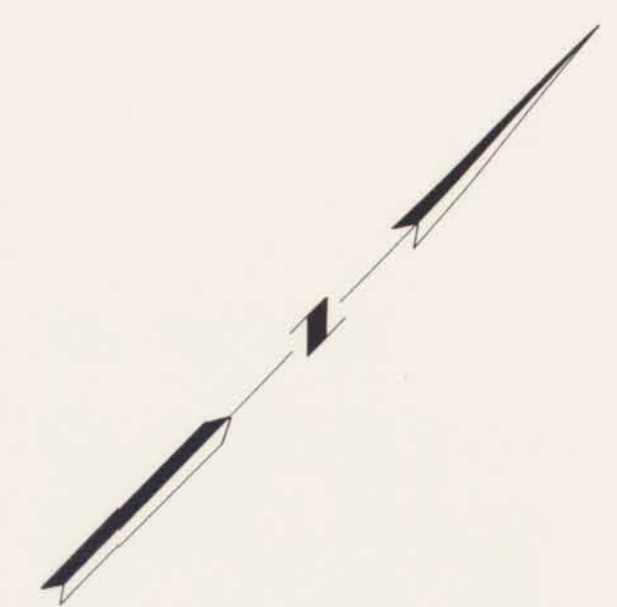
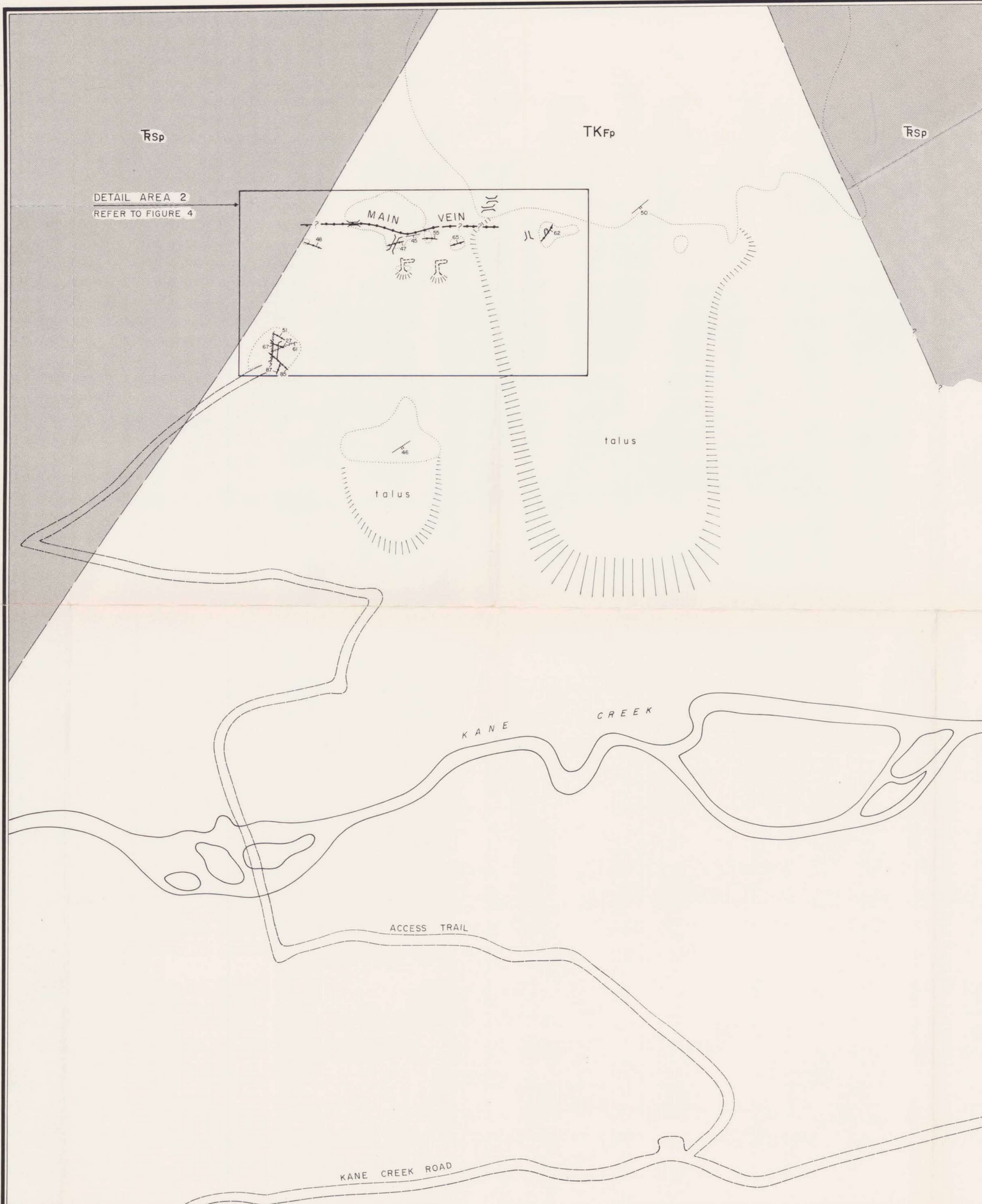
**GEOLOGICAL BRANCH  
 ASSESSMENT REPORT**  
**18,547**

EXCELLON RESOURCES INC.  
**GEOLOGY**  
 KANE CREEK PROPERTY  
 SLOCAN MINING DIVISION, B.C.  
 NTS 82K 3W, 3E



AMERLIN EXPLORATION SERVICES LTD.  
 108-525 SEYMOUR STREET  
 VANCOUVER, B.C. V6B 3H7





LEGEND

LITHOLOGIES

- TERTIARY-CRETACEOUS?  
**TKFp** Feldspar porphyry  
 TRIASSIC  
 SLOCAN GROUP  
**RSp** Phyllite, argillite

SYMBOLS

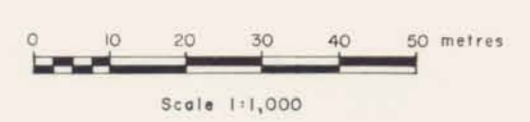
- Approximate outcrop distribution
- Inferred lithologic contacts
- Joint
- Fault
- Vein
- Adit
- Trench
- Prospect pit
- Dump/talus
- Road/trail

GEOLOGICAL BRANCH  
 ASSESSMENT REPORT  
 18,547

NOTE:  
 Refer to Plate 1 for location.

EXCELLON RESOURCES INC.  
**GEOLOGY**  
 MAIN VEIN-DETAIL AREA I

KANE CREEK PROPERTY  
 SLOCAN MINING DIVISION, B.C. NTS 82K/3W, 3E



AMERLIN EXPLORATION SERVICES LTD.  
 108-525 SEYMOUR STREET  
 VANCOUVER, B.C. V6B 3H7