

CRAIGMONT MINES LIMITED  
SUMMARY REPORT  
CHU CHUA MASSIVE SULFIDE DEPOSIT  
BY NELS VOLLO, P.ENG.  
JAN. 5th, 1983

*B.C.*

840836 92P/8

CRAIGMONT MINES LIMITED  
SUMMARY REPORT  
CHU CHUA COPPER PROPERTY  
NEAR  
BARRIERE, B.C.

BY  
N.B. VOLLO, P.ENG.  
JAN. 5th, 1983

### SUMMARY

The Chu Chua deposit is a volcanogenic massive sulfide deposit containing some 2,500,000 tonnes grading 2.00% Cu, 0.50% Zn, 0.5 g/t Au, 9 g/t Ag and 0.05% Co, 180,000 tonnes of talc and 450,000 tonnes of magnetite. Gross value at present prices exceeds \$100,000,000. About 1,500,000 tonnes of copper ore, most of the talc and all of the magnetite could be mined from a small pit.

Preliminary metallurgical work indicates that the gold, silver and cobalt are contained in pyrite, do not appear in the copper concentrate and would therefore not likely be recoverable.

The worth of the deposit is dependant on finding similar bodies nearby and good possibilities remain at depth, along strike and in parallel zones.

### GEOLOGY

The deposit consists of a series of tabular beds of sulfides, magnetite and talc conformable with and enclosed by basalt flows and tuffite. The sequence faces and dips steeply west and the mineral zone has been traced over a distance of 600 m and to a depth of 500 m. Width varies from a fraction of a metre to 25 m, and including magnetite and talc, as much as 40 m.

The deposit was originally formed on a sea bottom above a fault or fracture zone that has been determined from the 1982 drilling to now strike easterly and dip steeply south. Work done at the University of Alberta suggests that the talc formed close to the vent zone; the magnetite and sulfides slightly further away and silica, to form the tuffite, at greater distances. The Chu Chua deposit is the extreme southern termination of a tuffite bed that can be traced for more than 2 km to the north. Numerous similar, parallel, tuffite beds are present on the property.

### EXPLORATION HISTORY

Subsequent to the discovery in 1978, 1800 km of Dighem Airborne EM and Magnetic survey were completed over an extensive area from Barriere to Clearwater. The most outstanding anomaly was over the deposit itself, but numerous conductors were found and detailed by ground EM, magnetic and geochemical surveys. No sulfide deposits were found.

The Dighem method is credited with good depth penetration and it is unlikely that any near surface sulfide bodies were missed. Further exploration must be based on detailed geology and such methods as Hg geochemistry, deep penetrating EM, gravity surveys, graphite discriminant IP, etc.

Approximately 11,000 m of diamond drilling in 59 holes has been completed on the deposit itself.

## EXPLORATION POTENTIAL

Down Dip - the deposit, though narrowing, remains open to depth and there is a reasonable probability that a comparable or larger body may be present. The locus of the mineralizing feeder zone is probably through holes 25 and 48 (Longitudinal Section), both containing talc, indicating a plunge of 65° to the south. Deep exploration should be concentrated along this trend.

Drill hole geophysics have limited applicability due to the disturbing effects of the sulfide bodies above. Similarly, because of the steep dips involved, Hg geochemistry is probably not practical. Exploration would therefore be largely by drilling and about 4000 m could usefully be done to explore an additional 200 m of depth, to about 800 m below surface.

Along Strike - the tuffite horizon in which the sulfide bodies occur extends at least 2 km to the north and possibly contains additional bodies. Lack of geochemical response indicates such bodies would be "blind". The graphite content of the tuffite makes deep penetrating EM methods of little use, but Spectral IP, which can discriminate between sulfides and graphite, could usefully be done. Mercury geochemistry would also be applicable in this area.

Parallel Zones - Volcanogenic sulfide bodies are frequently "stacked" and such bodies should be sought for, particularly to the east, or source, direction. An attempt should be made to trace the feeder zone to the east, using EM methods and short drill holes and concentrating exploration at the projected intersections of this zone with the many known tuffite horizons. Again, because of the lack of geochemical response, sulfide zones are probably "blind" but may be detectable by Deep EM, Spectral IP, Mercury geochemistry or gravity surveys.

N.B. Vollo, P.Eng.  
Jan. 5th, 1983

APPENDICES

APPENDIX I - ORE RESERVES AND METALLURGY

APPENDIX II - SUMMARY OF AGREEMENT WITH VENDORS

APPENDIX III - LOCATION MAP

APPENDIX IV - GEOLOGICAL MAP, 1:5000

APPENDIX V - SURFACE PLAN, 1:2500

APPENDIX VI - LONGITUDINAL SECTION

APPENDIX VII - VERTICAL SECTIONS 9600  
9700  
9800  
9900  
10000  
10100  
10200  
10300

ORE RESERVE - CHU CHUA

<u>SECTION</u>	<u>TONNES (4.0*)</u>	<u>%Cu</u>	<u>TONNES TALC (2.8)</u>	<u>TONNES MAGNETITE (4.5)</u>
9800	338,000	2.77		
9900	297,000	1.43	35,000	
9950	325,000	1.49	151,000	190,000
10000	394,000	1.91		67,000
10050	396,000	1.68		169,000
10100	441,000	2.29		50,000
10150	235,000	2.89		
10200	150,000	2.50		
<hr/>				
TOTAL	2,576,000	2.07	186,000	476,000
PIT	1,607,000	2.10	151,000	476,000

The calculation was made by converting drill intersections to true width and multiplying by the heights and widths they represent and by the arbitrarily chosen specific gravity values indicated.

The talc and magnetite form essentially discrete and relatively pure bodies. The talc may be marketable in western Canada and the northwestern US at prices from \$20 to \$200 per tonne, FOB minesite. The magnetite may be marketable to coal mines in BC and Alberta.

No pit was actually laid out and the tonnage available is a rough estimate only.

METALLURGY

A representative composite sample was prepared from drill core sample rejects and a preliminary flotation test was performed by Kamloops Research & Assay Laboratories. The composite assayed 1.94%Cu, 0.47%Zn, 0.03%As, 8.9g/t Ag, 0.65g/t Au, 60ppm Hg and 0.046% Co. The test indicates that a good copper concentrate can be prepared using relatively fine grinding but that most of the Au, Ag and Co would not be readily recoverable.

Au content increases markedly in the deep holes, to as high as 3.7 g/t in sulfides, and in one case to 3.6 g/t over 3.7m, in tuffite barren of sulfides.

\* Specific Gravity

# CRAIGMONT MINES LIMITED

TO: Distribution December 9, 1980  
FROM: Ian E. Marshall File: 02-03-117E  
RE: Summary - Formal Agreement dated as of September 6, 1978 with Vestor Explorations Ltd., Seaforth Mines Ltd., and Pacific Cassiar Limited

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This formal Agreement executed on December 4, 1980 covers the so-called "Chu Chua" property and arises from a lengthy re-negotiation of the original Letter Agreement accepted by the Vendors on September 6, 1978. This copper prospect covers CC1 to CC11 Claims, CH1 to CH13 and CH15 to CH16 Claims, plus the AC1 and AC2 Claims in the Kamloops Mining Division near Barriere, B.C.

## CRAIGMONT'S COMMITMENTS

1. In consideration of the Vendors transferring and assigning all ownership, management and control of the Schedule A and C Claims, to Craigmont, Craigmont agreed to:
  - (a) Drill a minimum of one diamond drill hole on the Claims before September 1, 1979 (done);
  - (b) pay to the Vendors \$60,000 on signing of this Agreement (done);
  - (c) include the Schedule B Claims staked by Craigmont under the terms of this Agreement.
2. In order to maintain its ownership in the Claims, Craigmont must
  - (a) Pay to the Vendors on or before December 31
    - 1980 to 1982, inclusive \$30,000
    - 1983 and 1984 \$50,000
    - 1985 and thereafter \$100,000provided that payments cease after the year in which the Date of Commencement of Production occurs. The Date of Commencement of Production is to occur by December 31, 1986, but this date may be extended in certain circumstances;
  - (b) for the period from the Date of Commencement of Production until the capital costs are recovered (the Initial Payment Date) by Craigmont, Craigmont shall pay to the Vendors 5.2% of Net Proceeds. In determining the Initial Payment Date, amounts paid by Craigmont to the Vendors pursuant to sub-paragraph (a) and this sub-paragraph (b) are to be taken into account;
  - (c) after the Initial Payment date, Craigmont shall pay 26% of Net Proceeds to the Vendors.

cont'd

THE VENDORS' INTEREST

Any claims subsequently staked or acquired by Craigmont or the Vendors within one kilometer from any of the Claims listed in Schedules A or B are deemed covered by this Agreement.

TERMINATION AND ABANDONMENT

1. The Vendors may terminate this Agreement if
  - (a) Craigmont defaults on any of its obligations to the Vendors and such default remains outstanding thirty days after written notice is given to Craigmont by the Vendors;
  - (b) Craigmont fails to cause the Date of Commencement of Production to occur on or before December 31, 1986, provided that Craigmont may extend this date by up to two years on the basis of sound economic reasons presented to the Vendors before December 31, 1985;
  - (c) after the Date of Commencement of Production, commercial mining and milling operations on the Claims are shutdown for thirty-six or more consecutive months, provided that Craigmont may extend this period for up to two additional years on the basis of sound economic reasons.
2. Craigmont may terminate this Agreement on two months' written notice to the Vendors. Craigmont may abandon any of the Claims effective on the last day of any month by giving not less than one month's written notice to the Vendors.

EFFECTS OF TERMINATION OR ABANDONMENT

1. Upon termination or abandonment before Craigmont commences to equip the Claims for production, Craigmont shall
  - (a) deliver up possession of the relevant Claims in good standing to the Vendors, provided that Craigmont may take twelve months to remove its assets therefrom;
  - (b) execute and deliver transfers to the relevant Claims to the Vendors;
  - (c) deliver relevant technical data on the Claims to the Vendors.
2. Upon termination after Craigmont commences to equip the Claims for production, Craigmont must fulfill the obligations set out in paragraph 1 and others, including a requirement to return the Claims in good standing for at least one year from the date of termination.

cont'd



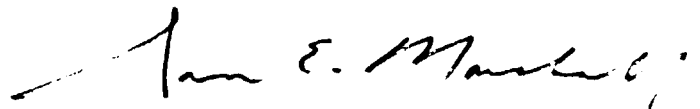
ASSIGNMENT

Craigmont shall not assign any interest in the Claims without the prior written consent of the Vendors, such consent not to be unreasonably withheld.

RIGHT OF FIRST REFUSAL

The Vendors have a right of first refusal for thirty days from the delivery of the written offer to them by Craigmont. If the Vendors decide not to exercise their right of first refusal, they must deliver their consent to the assignment or their written reasons for refusing to consent to Craigmont within thirty-four days of receiving delivery of a copy of the written offer. Any assignee from Craigmont must execute an assumption agreement with the Vendors in the form of Schedule D to the Agreement.

This is a complex agreement and reference should be made to the formal Agreement in the above-mentioned Central File before taking any action on this matter. The summary set out herein is an attempt to outline the basic commitments only.



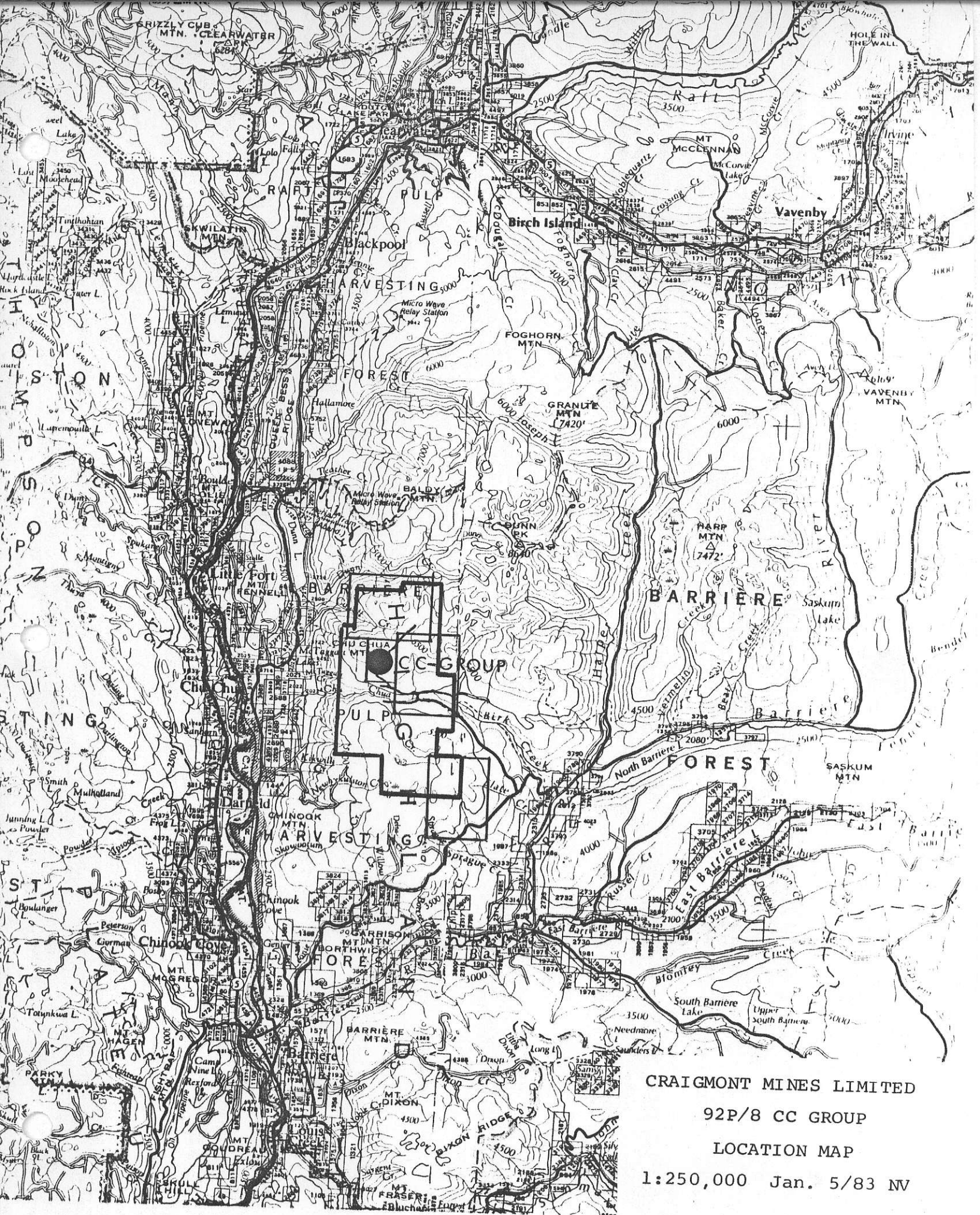
Ian E. Marshall  
Solicitor

IEM:sb

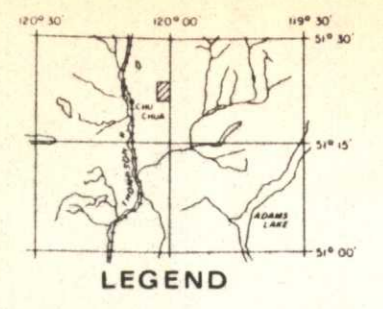
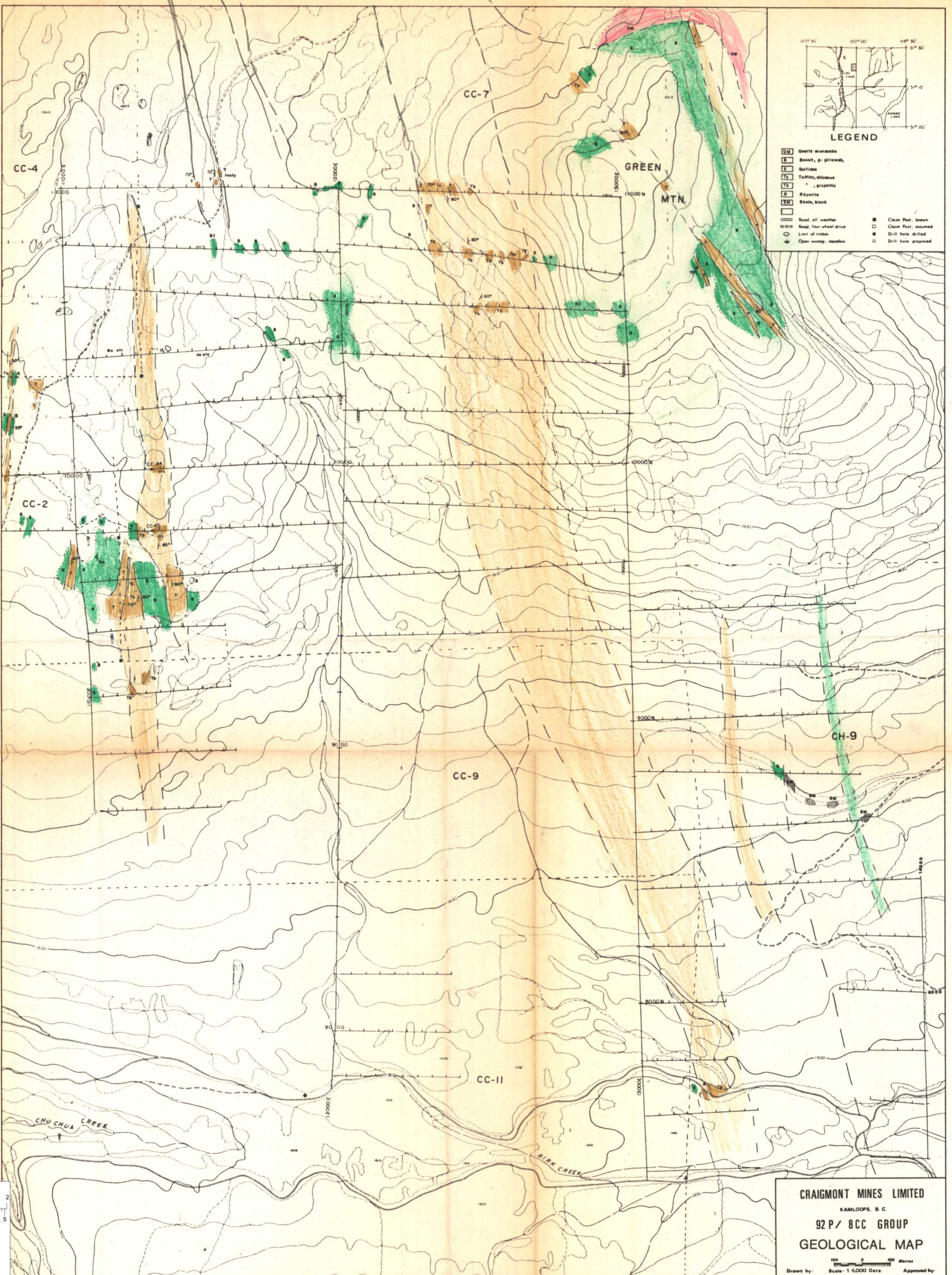
DISTRIBUTION:

W. Diment  
R. G. Duthie  
A. J. Petrina  
J. H. Eastman  
T. W. Beattie  
H. F. Gougeon  
D. Hallam

M. P. Leroux  
J. M. McConville  
J. L. McPherson  
J. Racich  
N. B. Vollo  
D. Raftery  
W. D. Thompson  
S. A. Thomson

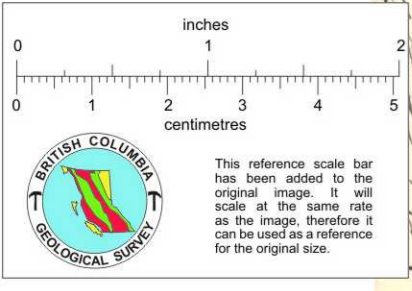


CRAIGMONT MINES LIMITED  
 92P/8 CC GROUP  
 LOCATION MAP  
 1:250,000 Jan. 5/83 NV

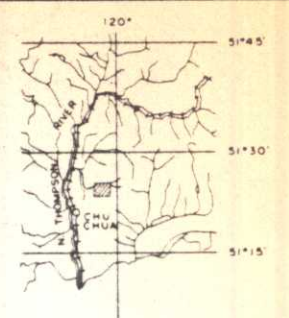
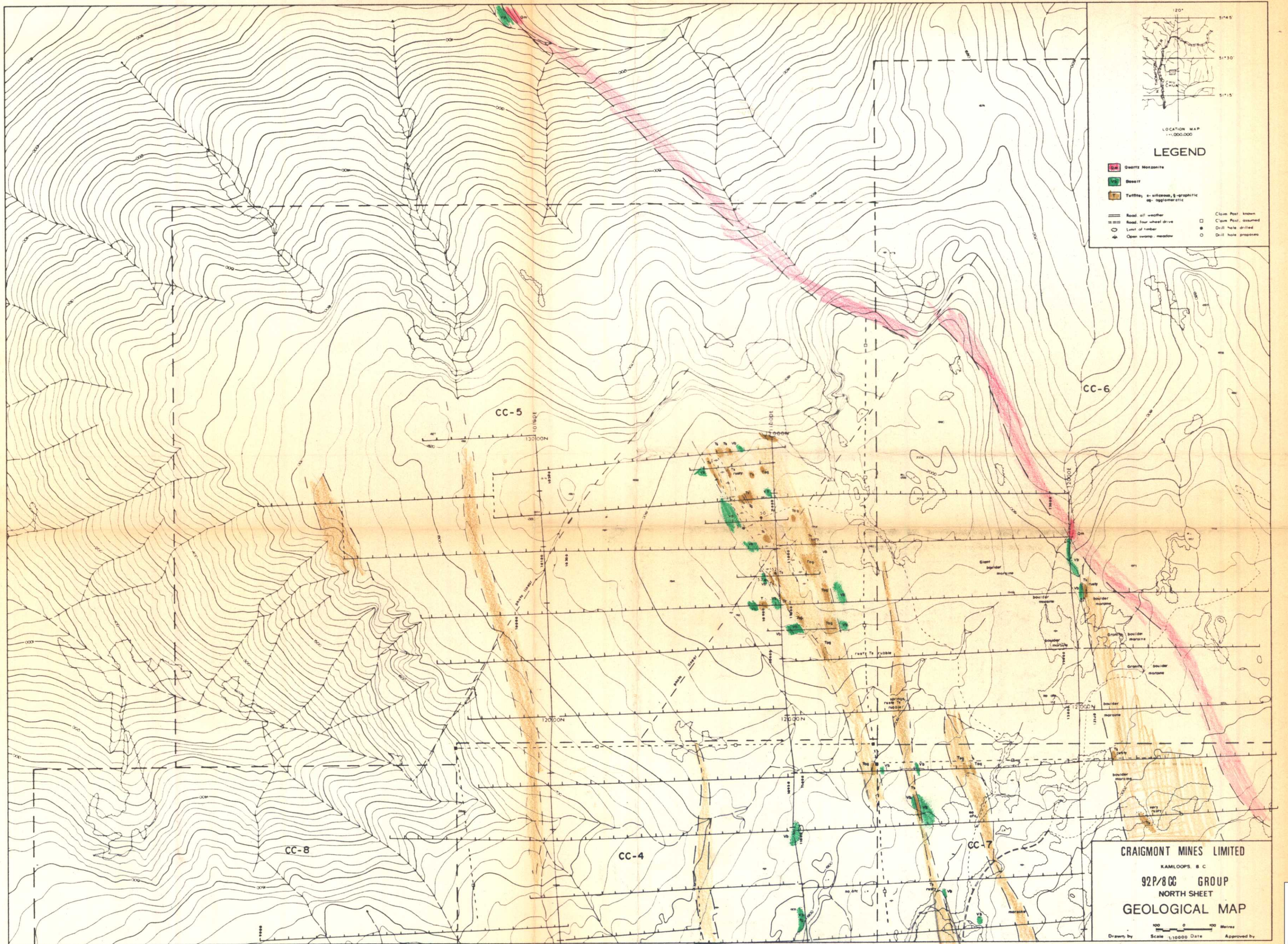


**LEGEND**

GM	Quartz monzonite	CP	Close Post, known
B	Basalt, p. pillowed	CP	Close Post, assumed
G	Gneiss	DH	Drill hole, drilled
T	Talus, siliceous	DH	Drill hole proposed
GR	Gneiss, granitic		
R	Rhyolite		
S	Shale, black		
	Road, all weather		
	Road, four wheel drive		
	Limit of timber		
	Open swamp, meadow		



**CRAIGMONT MINES LIMITED**  
 KAMLOOPS, B. C.  
**92 P/ 8CC GROUP**  
**GEOLOGICAL MAP**  
 Scale: 1:5,000 Date: \_\_\_\_\_ Approved by: \_\_\_\_\_



LOCATION MAP  
1:100,000

**LEGEND**

- Quartz Monzonite
- Basalt
- Tuffites, s-siliceous, g-graptolitic, ag-agglomeratic
- Road, all-weather
- Road, four-wheel drive
- Limit of timber
- Open swamp, meadow
- Claim Post, known
- Claim Post, assumed
- Drill hole drilled
- Drill hole proposed

CC-5

CC-6

CC-8

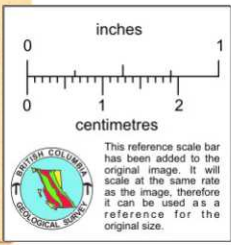
CC-4

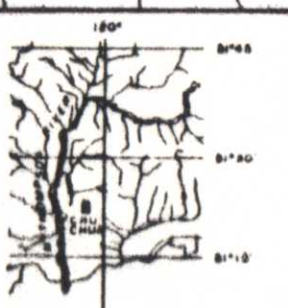
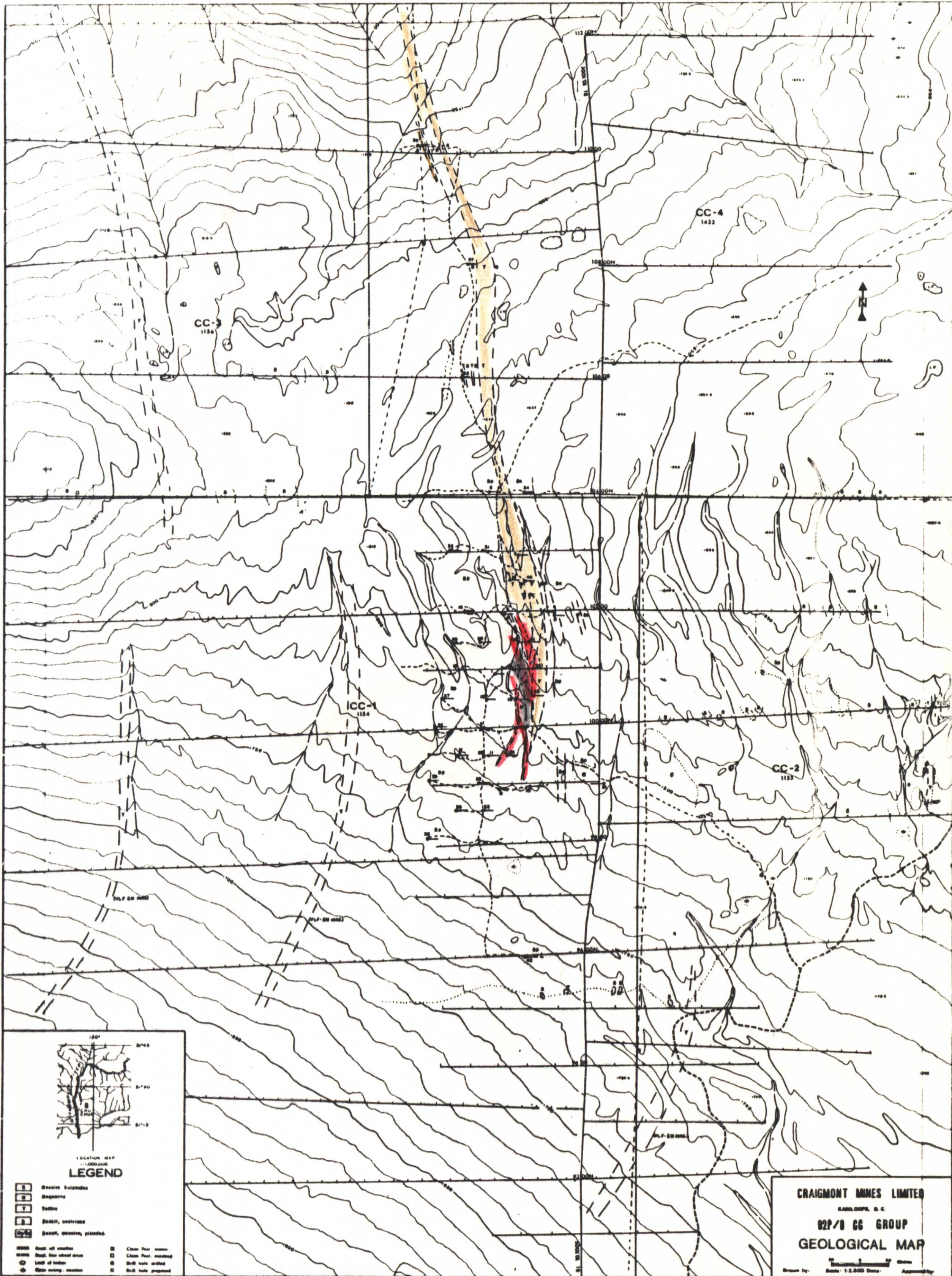
CC-7

**CRAIGMONT MINES LIMITED**  
KAMLOOPS, B.C.  
**92P/8 CC GROUP**  
NORTH SHEET  
**GEOLOGICAL MAP**

Scale 1:10000 Date Approved by

92P/8CC-20





**LEGEND**

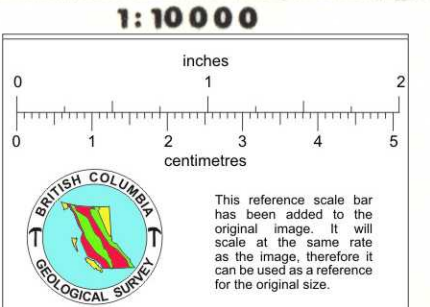
- Quarry boundaries
- Dike
- Fault
- Ditch, drainage
- Ditch, drainage, pipeline
- Road, all weather
- Road, four wheel drive
- Line of fence
- Stone masonry structure
- Chain Post marker
- Chain Post marked
- Well hole marker
- Well hole marked

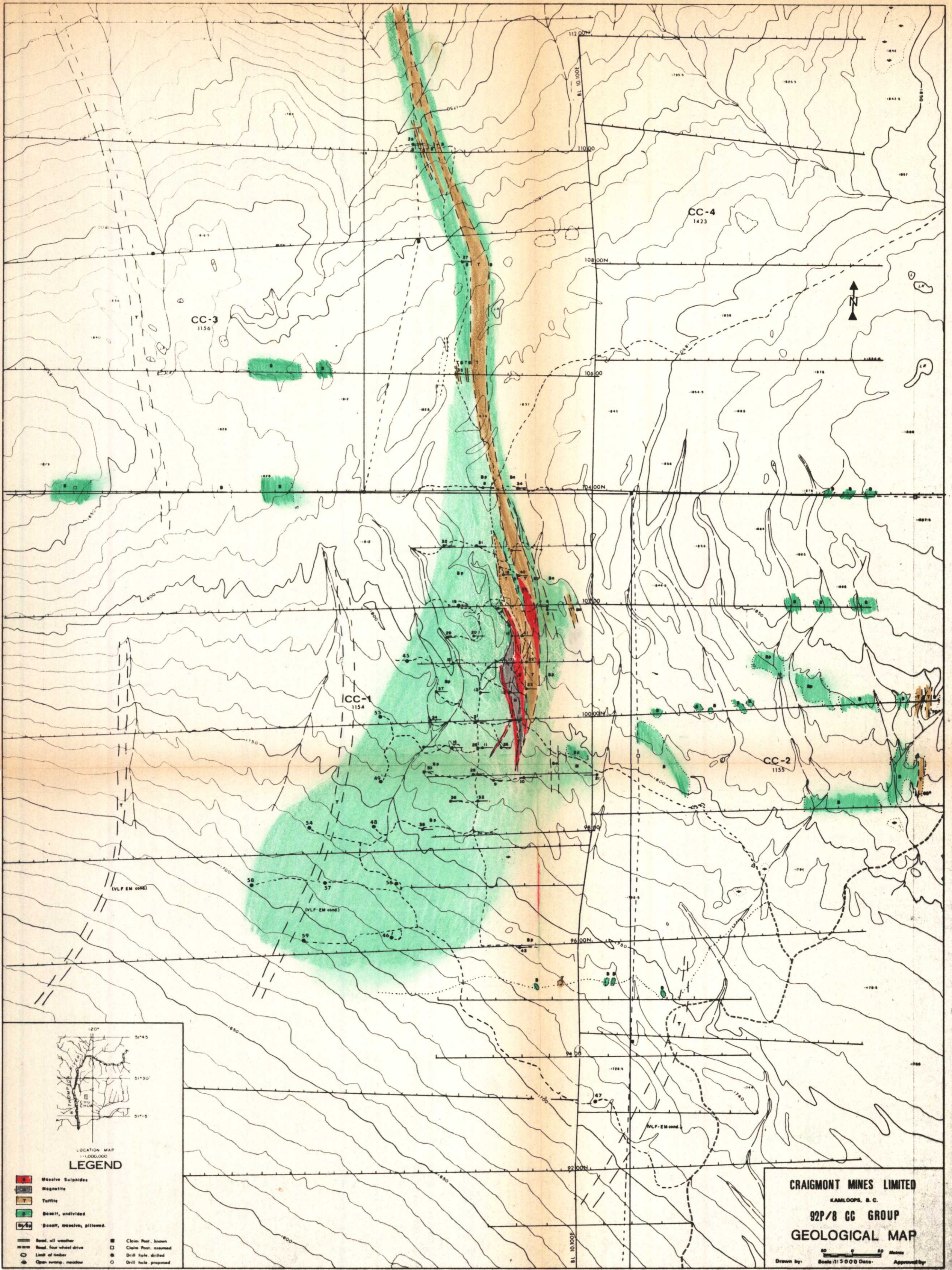
PACIFIC SURVEY CORPORATION 78-174  
BASE MAP

**CRAIGMONT MINES LIMITED**  
KAMLOUP, B.C.  
**92P/B CC GROUP**  
**GEOLOGICAL MAP**

Scale: 1:10,000

92P/B CC-5



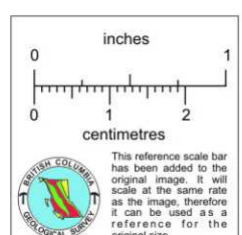


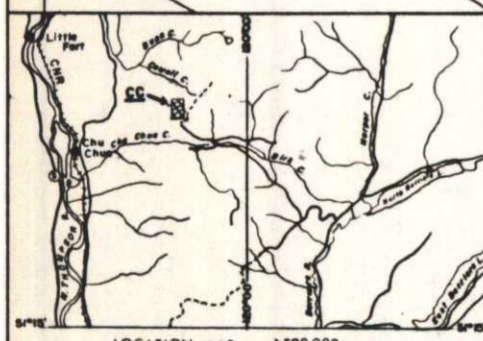
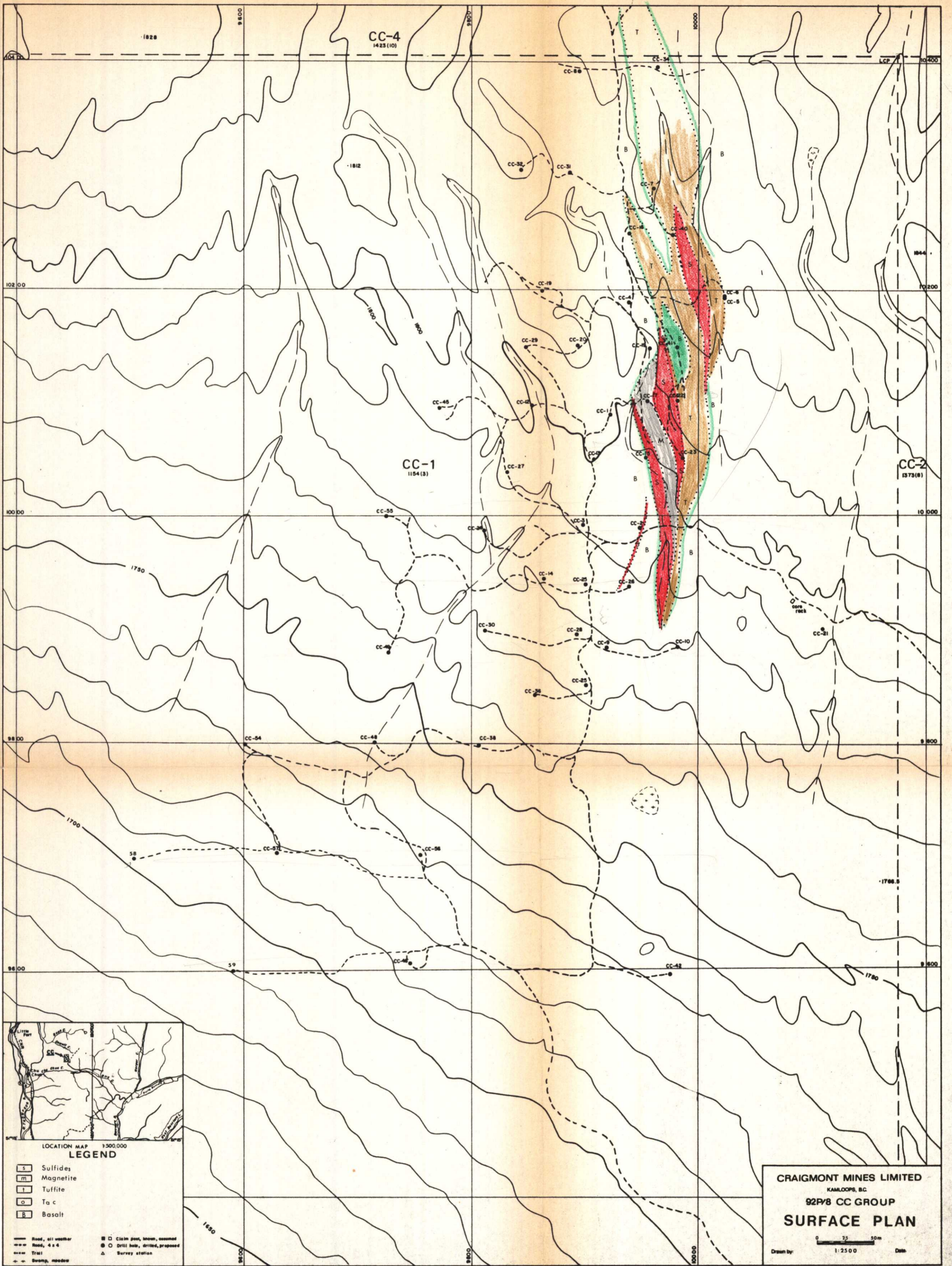
**LEGEND**

	Massive Sulphides		Claim Post, known
	Magnetite		Claim Post, assumed
	Tuffite		Drill hole drilled
	Basalt, undivided		Drill hole proposed
	Basalt, andesite, pillowed		
	Road, all weather		
	Road, four wheel drive		
	Limit of timber		
	Open camp, modern		

**CRAIGMONT MINES LIMITED**  
 KAMLOOPS, B. C.  
**92P/8 CC GROUP**  
**GEOLOGICAL MAP**

Scale: 1:5000 Date: \_\_\_\_\_ Approved by: \_\_\_\_\_



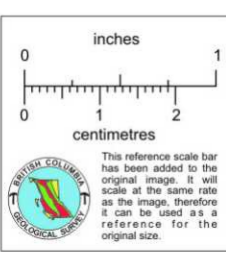


LOCATION MAP 1:500,000

**LEGEND**

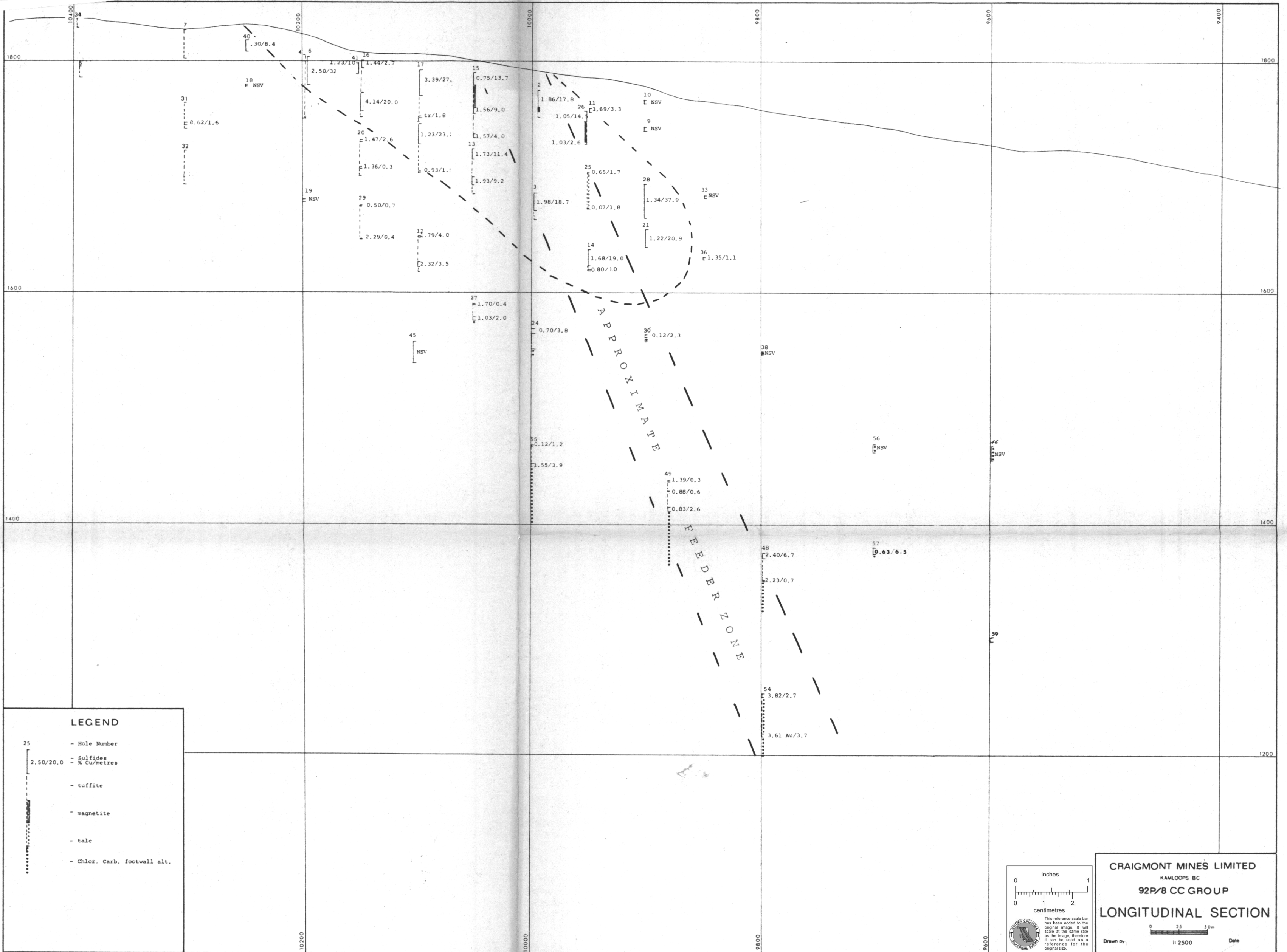
S	Sulfides	□	Claim post, known, assumed
M	Magnetite	○	Drill hole, drilled, proposed
T	Tuffite	△	Survey station
C	Ta c		
B	Basalt		

——— Road, all weather  
 - - - - Road, 4 x 4  
 - - - - Trail  
 - - - - Swamp, meadow



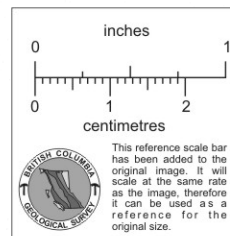
**CRAIGMONT MINES LIMITED**  
 KAMLOOPS, B.C.  
 92P/8 CC GROUP  
**SURFACE PLAN**

0 25 50m  
 1:2500  
 Drawn by: \_\_\_\_\_ Date: \_\_\_\_\_



**LEGEND**

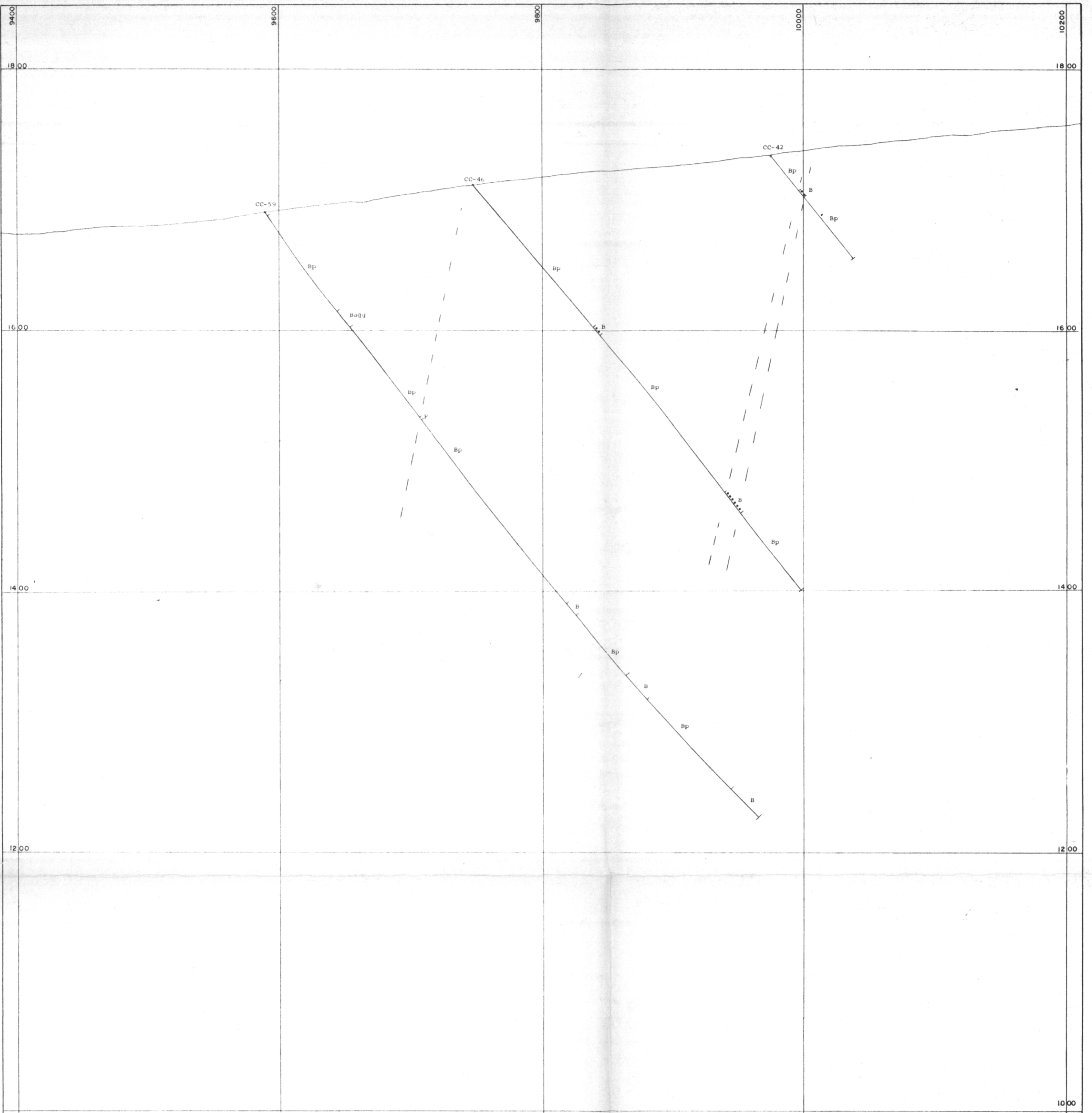
- 25 - Hole Number
- 2.50/20.0 - Sulfides  
% Cu/metres
- tuffite
- magnetite
- talc
- Chlor. Carb. footwall alt.



**CRAIGMONT MINES LIMITED**  
 KAMLOOPS, BC  
**92P/8 CC GROUP**  
**LONGITUDINAL SECTION**

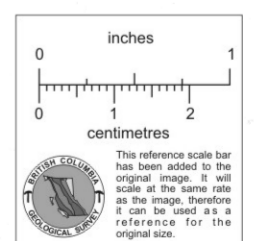
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 1:2500





**LEGEND**

- Casing - overburden
  - B Basalt, massive - possible dike
  - Bp Basalt, pillowed bx-breccia, t-tuff agg - agglomerate
  - T Tuffite bx-breccia, g-graphitic
  - S Sulfides
  - Talc
  - M Magnetite
  - Chlorite - Carbonate alteration
- metres %Cu  
20 - 100  
50 (standard)



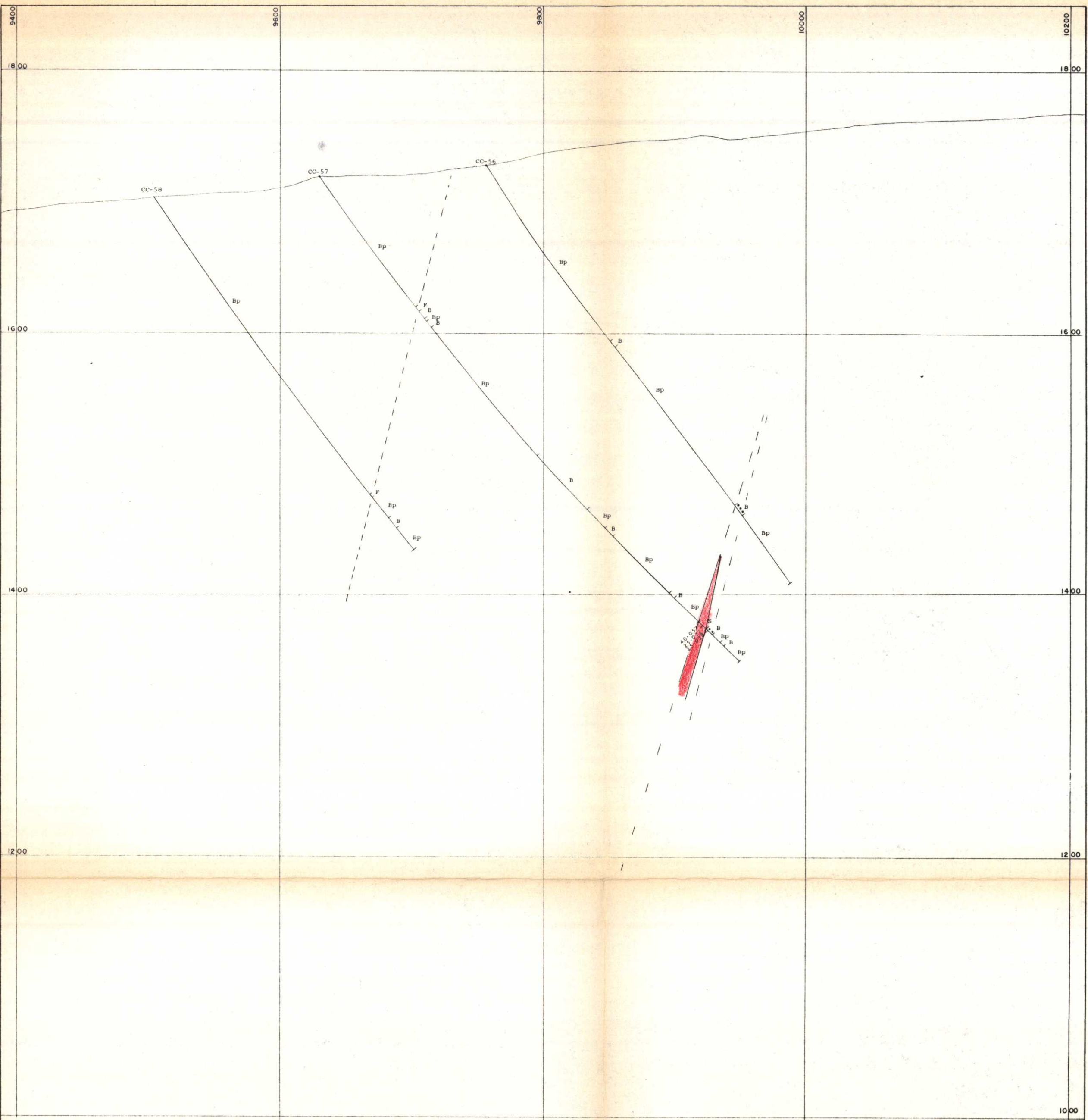
**CRAIGMONT MINES LIMITED**  
KAMLOOPS BC  
92P/8 CC GROUP  
SECTION 9600

0 25 50 m  
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Drawn by \_\_\_\_\_ Date \_\_\_\_\_

9600

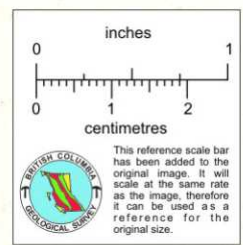
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10000



**LEGEND**

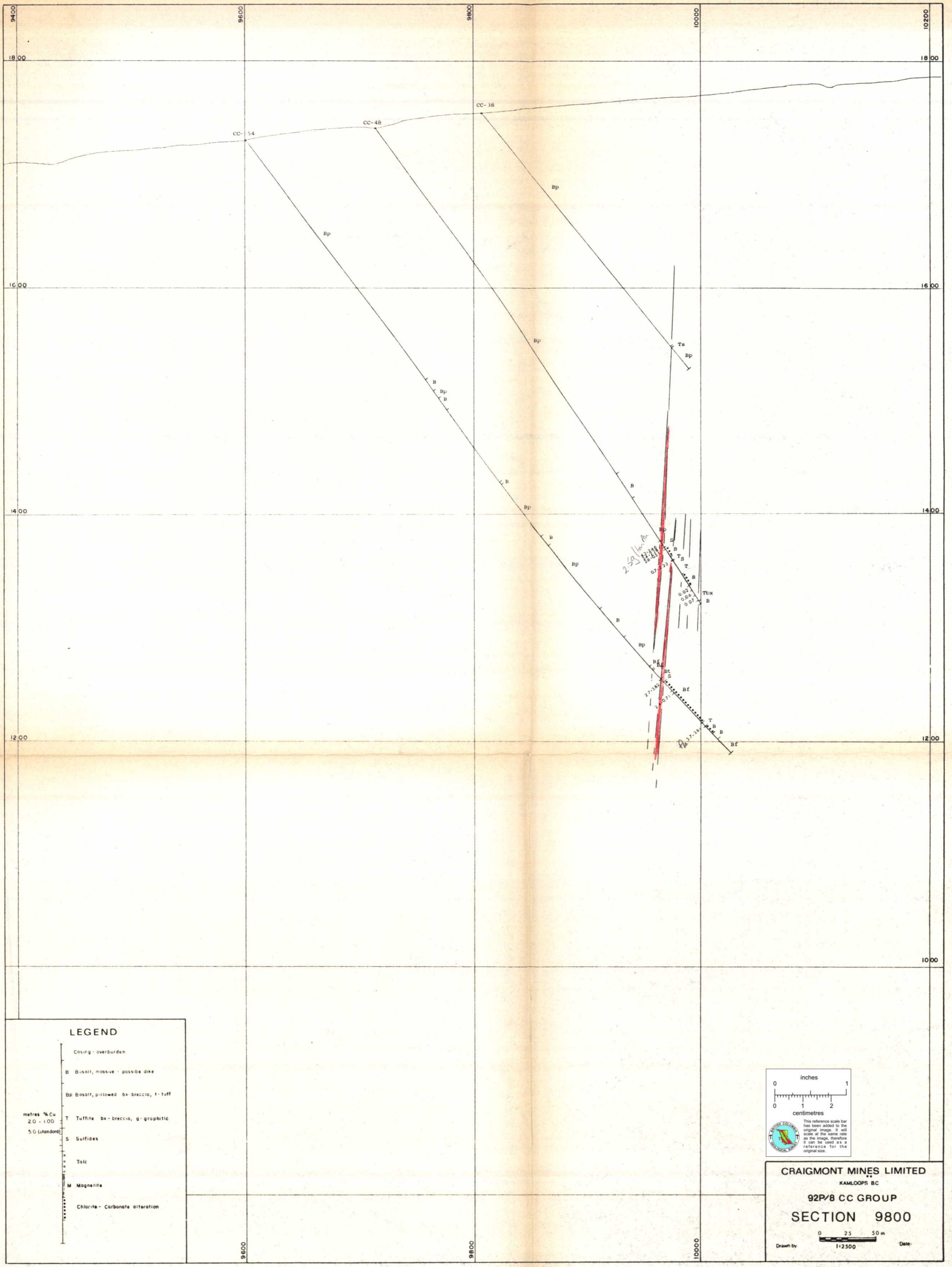
- Casing - overburden
  - B Basalt, massive - possible dike
  - Bp Basalt, pillowed bx - breccia, t - tuff
  - T Tuffite bx - breccia, q - graphitic
  - S Sulfides
  - Talc
  - M Magnetite
  - ..... Chlorite - Carbonate alteration
- metres % Cu  
20 - 100  
50 (standard)



**CRAIGMONT MINES LIMITED**  
KAMLOOPS BC

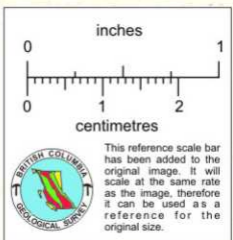
**92P/8 CC GROUP**  
**SECTION 9700**

0 25 50 m  
1:2500 Date:



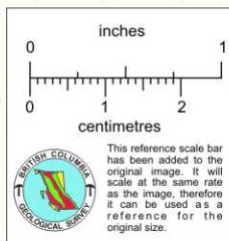
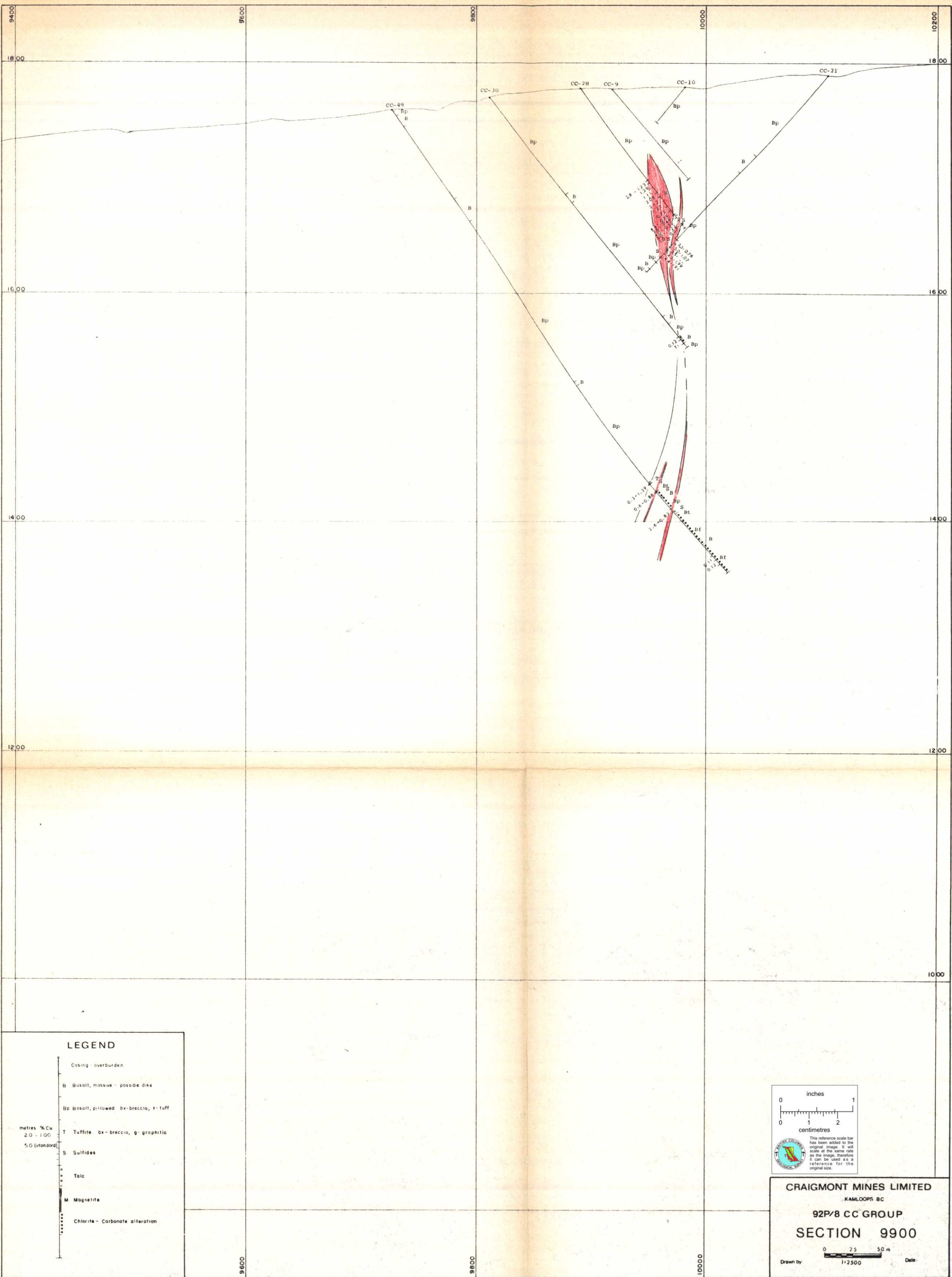
**LEGEND**

- Casing - overburden
  - B Basalt, massive - possible dike
  - Bp Basalt, pillowed by breccia, tuff
  - T Tuffite - breccia, g-graphitic
  - S Sulfides
  - Talc
  - M Magnetite
  - Chlorite - Carbonate alteration
- metres %Cu  
20 - 100  
5.0 (standard)



**CRAIGMONT MINES LIMITED**  
 KAMLOOPS, BC  
**92P/8 CC GROUP**  
**SECTION 9800**

0 25 50 m  
 1:2500  
 Drawn by \_\_\_\_\_ Date: \_\_\_\_\_

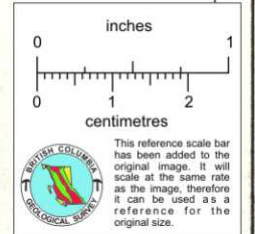




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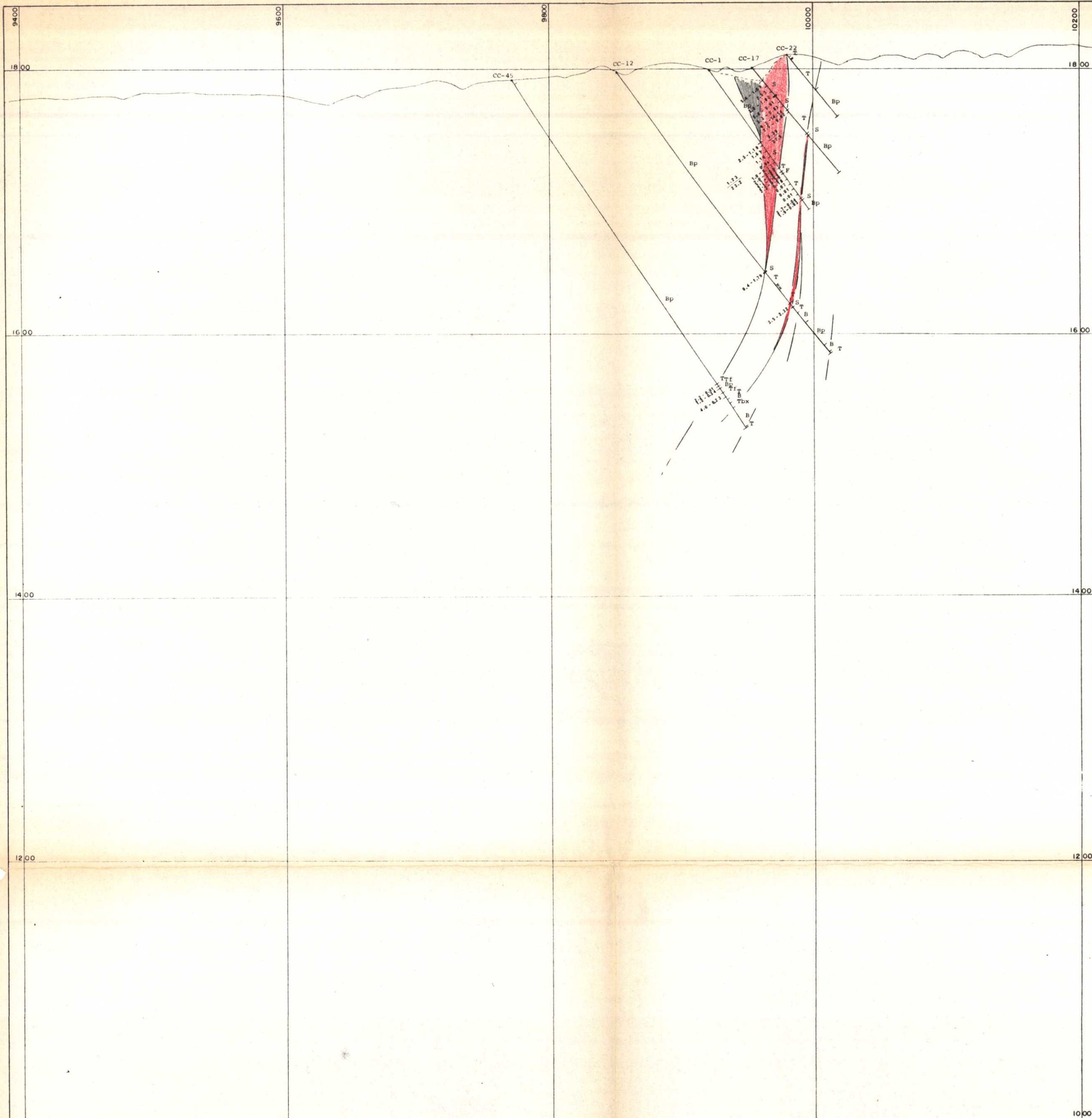
- Casing - overburden
- B Basalt, massive - possible dike
- Bp Basalt, pillowed bx-breccia, t-tuff
- T Tuffite bx-breccia, g-graphitic
- S Sulfides
- Talc
- M Magnetite
- Chlorite - Carbonate alteration

metres %Cu  
20 - 100  
50 (standard)

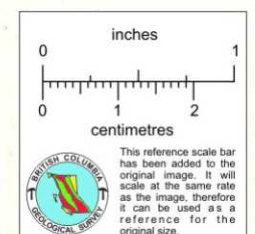


**CRAIGMONT MINES LIMITED**  
KAMLOOPS BC  
**92P/8 CC GROUP**  
**SECTION 10000**

0 25 50 m  
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Drawn by \_\_\_\_\_ Date \_\_\_\_\_

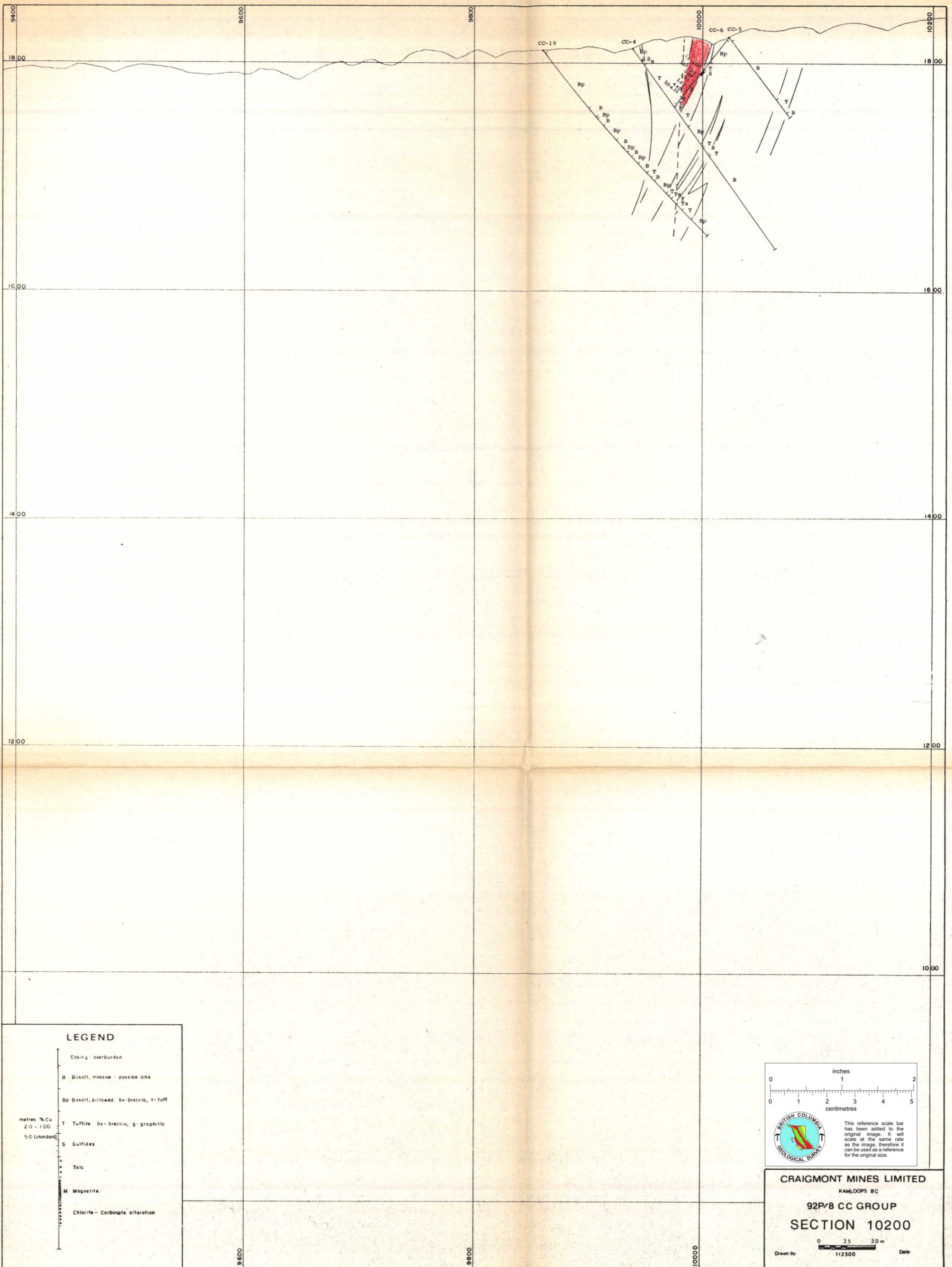


- Casing - overburden
  - B Basalt, massive - possible dike
  - Bp Basalt, pillowed bx-breccia, t-tuff
  - T Tuffite bx-breccia, g-graphitic
  - S Sulfides
  - Talc
  - M Magnesite
  - Chlorite - Carbonate alteration
- metres %Cu  
20 - 100  
5.0 (standard)



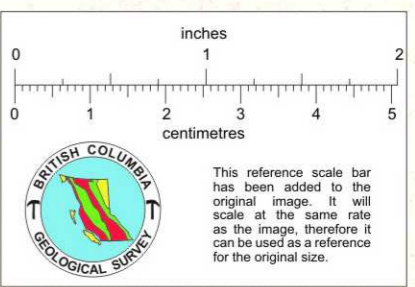
**CRAIGMONT MINES LIMITED**  
 KAMLOOPS, BC  
**92P/8 CC GROUP**  
**SECTION 10100**

0 25 50 m  
 1:2500  
 Drawn by \_\_\_\_\_ Date \_\_\_\_\_



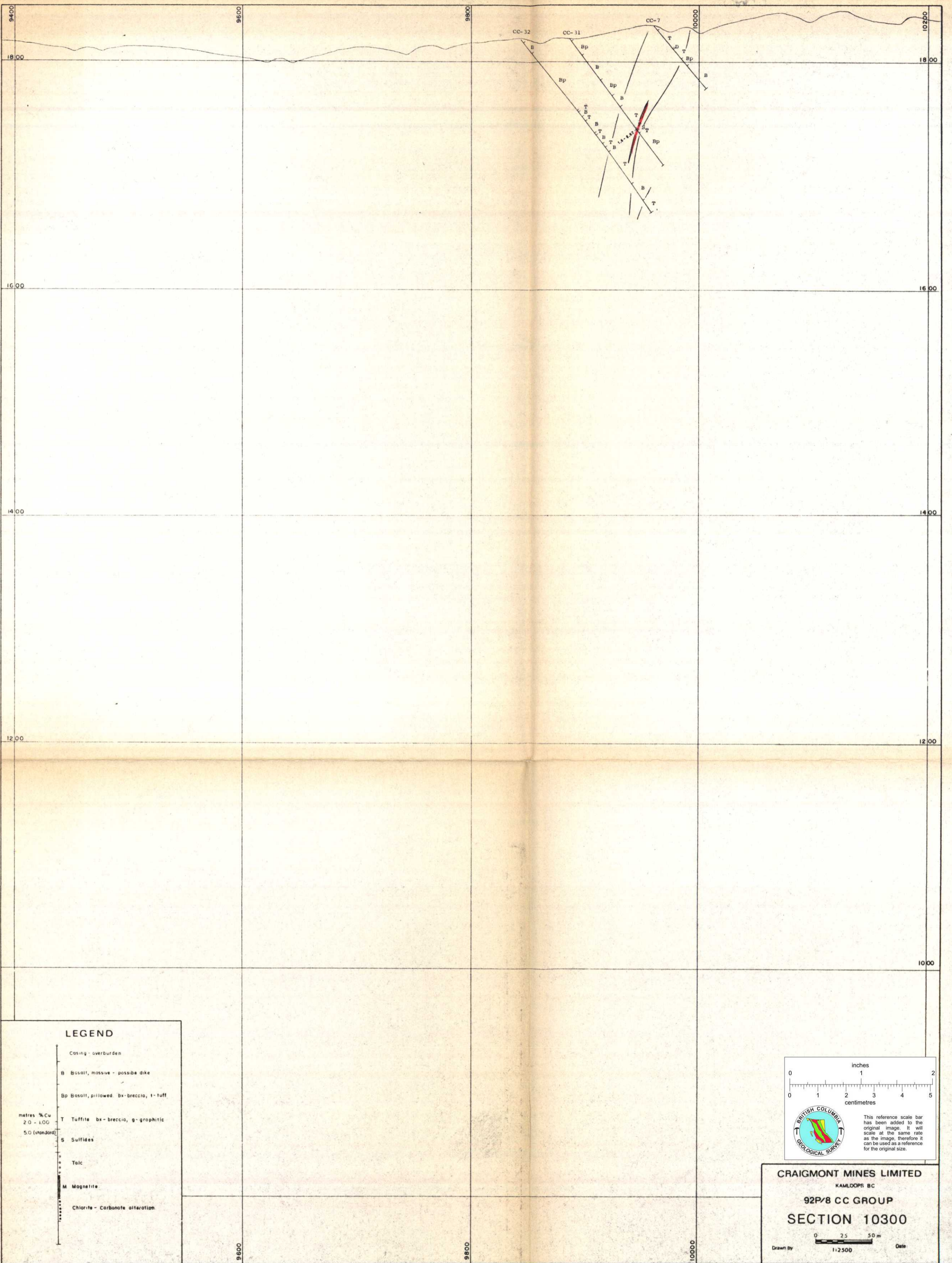
**LEGEND**

- Casing - overburden
- B Basalt, massive - possible dike
- Bp Basalt, pillowed, bx-breccia, t-tuff
- T Tuffite bx-breccia, g-graphitic
- S Sulfides
- Talc
- M Magnetite
- Chlorite - Carbonate alteration



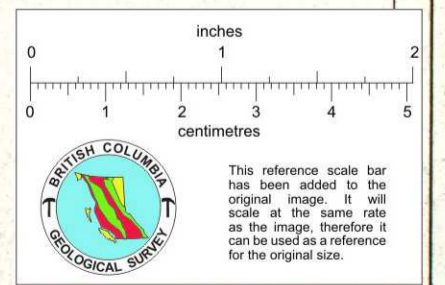
**CRAIGMONT MINES LIMITED**  
 KAMLOOPS BC  
 92P/8 CC GROUP  
 SECTION 10200

Drawn by \_\_\_\_\_ Date \_\_\_\_\_  
 1:2500



**LEGEND**

- Casing - overburden
  - B Basalt, massive - possible dike
  - Bp Basalt, pillowed, bx - breccia, t - tuff
  - T Tuffite bx - breccia, g - graphitic
  - S Sulfides
  - Talc
  - M Magnetite
  - Chlorite - Carbonate alteration
- metres %Cu  
2.0 - 1.00  
5.0 (standard)



**CRAIGMONT MINES LIMITED**  
KAMLOOPS BC  
**92P/8 CC GROUP**  
**SECTION 10300**

0 2.5 5.0 m  
1:2500  
Drawn by \_\_\_\_\_ Date \_\_\_\_\_