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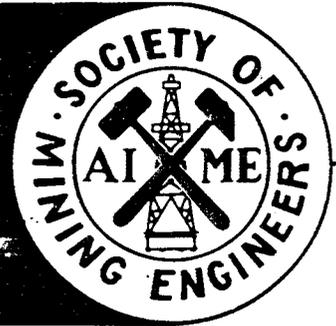
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GENERAL GEOLOGY AND SOME STRUCTURAL FEATURES OF THE
 COURTLAND-GLEESON AREA, COCHISE COUNTY, ARIZONA - Lib.

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 Tucson, Arizona

*Bear Creek
 Co. Arizona*

This paper is to be presented at the SME Fall Meeting -
 Rocky Mountain Minerals Conference, Phoenix, Arizona
 October 7 to 9, 1965

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**GENERAL GEOLOGY AND SOME STRUCTURAL FEATURES OF THE
COURTLAND-GLEESON AREA, COCHISE COUNTY, ARIZONA**

by

Otis M. McRae, Senior Geologist

BEAR CREEK MINING COMPANY

TUCSON, ARIZONA

ABSTRACT

The Courtland-Gleeson area is located in Cochise County about 15 miles east of Tombstone in southeastern Arizona.

Rocks exposed in the area range in age from Precambrian to Quaternary. The Precambrian is represented by the Pinal schist. Paleozoic rocks include the Cambrian Bolsa quartzite and Abrigo limestone, Mississippian Escabrosa limestone, and the Permo-Carboniferous Naco Group limestones. Rocks believed to be of Triassic and/or Jurassic age include the Copper Belle monzonite porphyry, Turquoise granite, and Gleeson quartz monzonite. The Cretaceous is represented by andesitic volcanics and various sedimentary rocks. Assigned to the Tertiary is the intrusive and extrusive Sugarloaf quartz latite porphyry. Numerous Tertiary dikes of various rock types also occur. Quaternary conglomerates cover the northern and eastern part of the area.

The geologic structure is extremely complex. All rocks from the Precambrian through the early Tertiary have been involved in either tilting, normal faulting, high angle reverse faulting, imbricate thrusting or compressional folding and overfolding. Major deformation was initiated some time during the first half of the Tertiary. Northeast-southwest compressional forces caused thrust plates containing lower Paleozoic rocks to override Cretaceous rocks. Subsequently, two large slide blocks of lower Paleozoic rocks, acting under the influence of gravity, moved eastward. One of these blocks is a mile long, a quarter of a mile wide and has moved 3,000 feet overriding Mississippian limestones. The imbricate structure and the gravity slide blocks were then broken by late Tertiary normal faults.

INTRODUCTION

The Courtland-Gleeson area, also known as the Turquoise Mining District, has long been recognized as an area of extreme structural complexity. James Gilluly (1956) referred to the entire district as a "gigantic thrust breccia". In 1962, Bear Creek Mining Company completed a two year program of detailed geologic mapping supported by exploration drilling. The purpose of this paper is to present some of the results

1435 S. 10th AVE.

P. O. BOX 1889

DUPLICATE

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PHONE 622-0813

Certificate No. 59357.....

TUCSON, ARIZONA 85702 July 11 1974

Sample Submitted by Mr. Pearce International, Inc - Mr. S.H. Holmberg

SAMPLE MARKED	X	OZ - 1/10th		SAMPLE MARKED	X	OZ - 1/10th	
		Au.	Ag.			Au.	Ag.
# 5825		0.007	0.53	# 5864		0.005	0.72
26		Trace	0.15	65		0.007	1.77
27		Trace	0.08	66		0.020	2.23
28		0.045	2.65	67		0.002	1.90
29		0.002	0.54	68		0.015	1.85
# 5861		0.025	0.45	69		0.005	2.03
62		0.020	0.94	70		Trace	1.56
63		0.063	0.47				
<i>Triplets - 1 - AT. FIRE ASSAYS MADE ON ABOVE SAMPLES</i>							

* Gold Figured \$35.00 per oz. Troy Commonwealth Mine very respectfully,

Charges \$ 112.50

Pearce, Az.

Ben B. Jacobs

MEMO 4/2/74
To: Paul Eimon
From: Bob Helming
Subject: Commonwealth Mine at Pearce, Cochise County, Arizona

Mr. Carl Thetford of Pearce, Arizona contacted me on Sunday, March 24 to present the Commonwealth Mine for Essex consideration. Mr. Thetford purports to own the seven patented and four unpatented claims comprising the property. He had many reports, a claims map, and one longitudinal section with posted assays, all of which he was reluctant to part with therefore I did not have time to peruse all the information he had available. Considerable data should be available from the Bureau of Mines and the university library.

The Commonwealth Mine as active until 1940 and produced \$10 million worth of silver and gold from veins in volcanic rocks. Up to 1927 the average grade was 27 oz/T silver.

The most interesting data I saw was a longitudinal section through the "main vein" showing the workings with assays also posted on the section. I have enclosed a sketch of the section drawn from memory and also a xerox copy of some "average" (?) assays which were typed on one corner of the section. Three ore shoots are indicated. "A" shoot is smaller and distinctly separate from the "B" and "850" shoots. The latter two overlap. A few assays were posted in the so-called barren zone between A and B shoots and they varied from about 1 to 3 oz/T silver. Mr. Thetford said there are five veins of varying widths but he was unsure of the total thickness of the mineralized zone. No drilling has ever been done on the property and essentially no mining was conducted below the sixth level due to large amounts of ground water.

Mr. Thetford is preparing to process the tailings which he believes contain 1.4 million tons averaging 2.72 oz/T Ag and 0.029 oz/T Au. Some placer mining has been done at the base of the hills and Thetford said they had just drilled a 300 foot water well on the north side of the property on mill site claims and the cuttings averaged 3 oz silver.

Portions of the upper workings of the mine are accessible therefore some sampling of the cross-cuts could be done to test continuity of mineralization between veins.

Mrs. Kim Howell, University of Arizona graduate student, is currently completing a masters thesis on the mine.

Mr. Thetford indicated at least one other company has expressed interest in the property. He also indicated there are no other claims in the area. (see enclosed map)

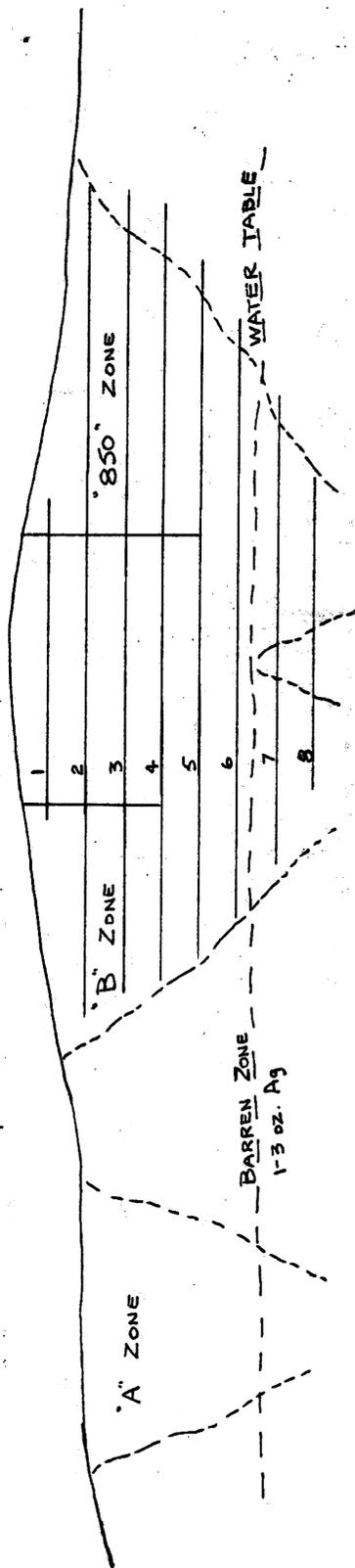
Conclusions There is considerable potential for an open pit silver-gold mine if Essex is interested. Assuming 12.5 cubic feet of rock per ton, a mineralized zone 2000 feet long, 300 feet wide, and averaging about 400 feet deep will produce 19.2 million tons of ore.

2000 ft. x 400 ft. x 300 ft.
12.5 cubic feet/ton = 19.2 million tons

There still remains the rather unusual possibility that significant placer deposits could be present as a result of accumulation of debris from the mineralized zone.

Recommendations

- 1) Conduct surface and underground examinations of the property insofar as Mr. Thetford will allow.
- 2) Check available literature for assay information, plan maps of workings, geologic data, etc.
- 3) Contact Mrs. Kim Howell to ascertain what information might be available in her thesis.



COMMONWEALTH MINE - PEARCE, AZ.

SKETCH FROM MEMORY

BHH.
4-2-74

MAIN VEIN - LONGITUDINAL SECTION (E-W UNKNOWN)

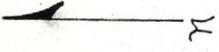
SCALE: 1 INCH = 300 FEET

PLATE-IV

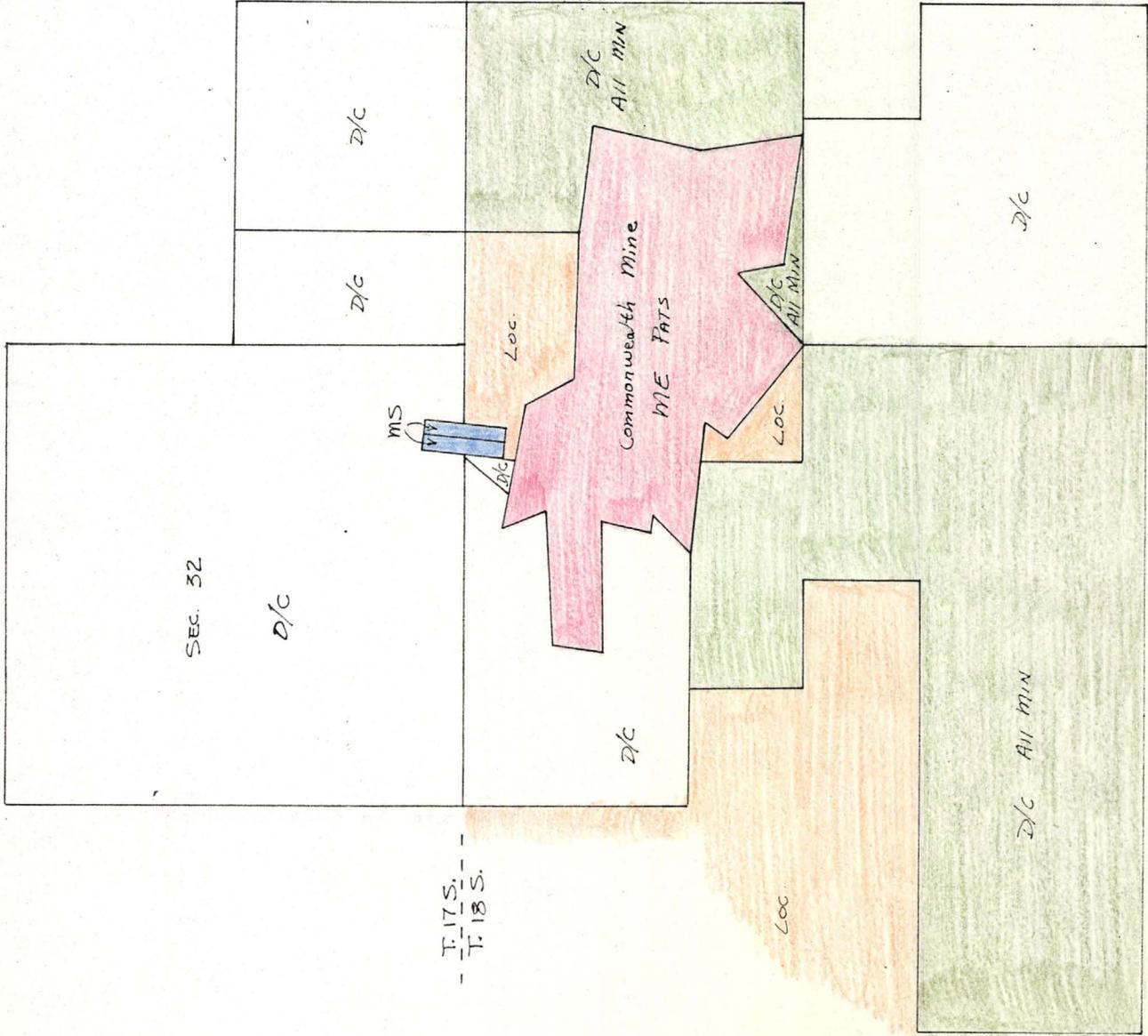
ZONES	"A" SHOOT		"B" SHOOT		"850" SHOOT	
	Oz. Ag	Oz. Au	Oz. Ag	Oz. Au	Oz. Ag	Oz. Au
Surface leached..	Kissing	Missing	29.0	0.1-0.2	Caliche zone.	0-0
Intermediate....	44.0-55.0	0.4-0.8	31.0) 57.0	35.0) 0.2-0.45	10.0	0.1
1st gold zone...	60.0) 67.0	1.7) 1.9	85.0) 100.0	0.8) 2.1	"Talc"	gangue
1st silver zone..	75.0) 150.0	2.1) 1.1	100.0) 85.0	2.7) 175.0	15.0	0.3
Intermediate....	99.0) 42.0	0.7) 0.2	85.0) 8.0	0.3) 0.15	48.0) 140.0	0.4) 0.6
2nd silver zone..	200.0) 45.0	1.6) 0.3	275.0) 15.0	0.6) 0.2	65.7) 12.0	0.45) 0.2
Intermediate....	43.5) 90.0	0.2) 1.3	25.0) 52.0	0.17) 0.6	9.1) 40.0	0.1) 0.2
2nd silver zone..	45.0) 150.0	0.3) 1.0	15.0) 125.0	0.2) 1.1	44.0) 140.0	0.2) 0.3
Intermediate....	24.0) 26.0	0.3) 0.4	10.0) 25.0	0.1) 0.25	5.0) 12.0	0.05) 0.07
2nd gold zone...	11.0) 8.2	0.24) 0.3	50.0) 200.0	3.5) 4.5	6.0) 20.0	0.2) 0.35
3rd silver zone..	15.4) 12.0	0.4) 0.1	200.0) 50.0	6.5) 0.5	15.0) 19.0	0.2) 0.1
Present water table	23.0) 14.0	0.1) 0.15	250.0) 125.0	1.2) 2.9	20.0) 24.0	0.1) 0.2
Intermediate....	Note: no work below 7th level.		3.0) 14.0	8.0) 0.06-0.2	3.5) 10.0	0.05) 0.1
3rd gold zone...	3rd zone poorly defined - low grade		3.0) 9.0	5.6) 0.8-2.2	1.5) Very irregular	poorly defined.
2nd silver zone..	East 1 (2-5-11)	West 1 (2-150-750)	11.2) 5.1	11.2) 0.2-0.25	6.5) 6.1	0.1) 0.12

2ND LEVEL

3RD LEVEL III



R. 25 E.



T. 17 S.
T. 18 S.

- D/C
All
MIN
- Loc.
- D/C
- ME
PATs
- MS

Original Patent
Minerals Reserved to U.S.
Minerals Locatable

Federal Land
Minerals Locatable

Original Patent (probably Hammerhead)
Minerals not in Federal ownership

Mineral Entry Patents

Mill site

SCALE 1 INCH = 1980 FEET

COURTLAND-GLEESON AREA

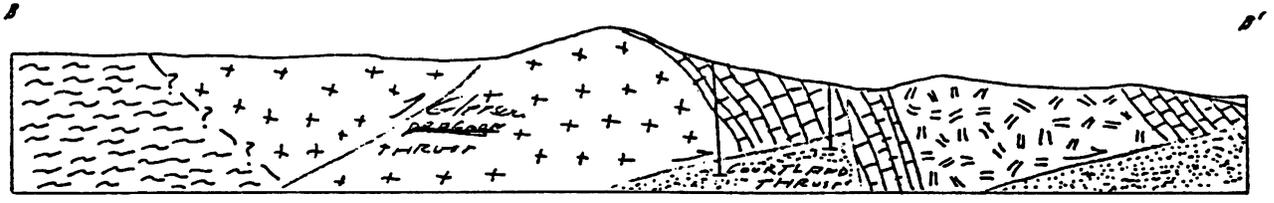
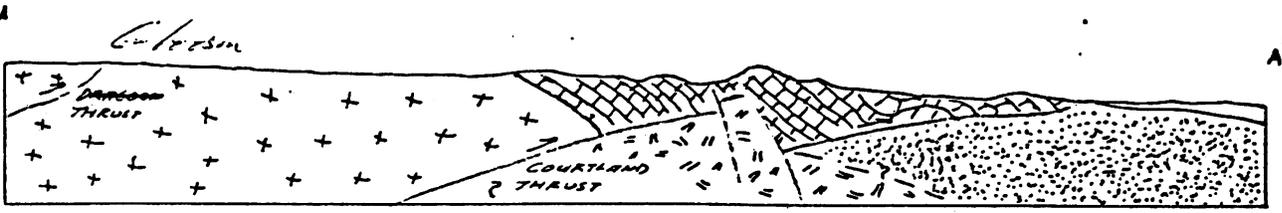
(notes for AGS-NMGS Field Trip Road Log)

by Pete Dunham
1978

The Turquoise mining district has produced nearly 30,000 tons of copper metal--most during the early part of the century when both Courtland and Gleeson were boom towns, and the Southern Pacific and the El Paso and Southwestern competed in getting the first railroad into the district. In the late fifties and early sixties, Bear Creek, ASARCO, Minerals Exploration and others were active in the area, and Minerals Exploration still holds ground where they discovered a small porphyry copper deposit. This deposit occurs beneath and between the two large isolated outcrops of Copper Belle monzonite porphyry immediately west of the road and east of Brown's Peak.

The area is structurally complex including several low-angle thrust faults or gravity slides--only two of these are shown on the accompanying sketch map. The Courtland thrust has apparently moved east, placing Paleozoic limestones over Cretaceous volcanics and Bisbee group sediments. It has been intersected by several diamond drill holes. The ~~Dragon~~^{Gleeson} thrust is not as definite but has placed weakly altered Gleeson quartz monzonite over highly altered and mineralized intrusive rock that was originally thought to be a separate rock, the "Turquoise granite", but is probably altered Gleeson quartz monzonite. The fault ~~had~~^{has} been intersected in one drill hole west of Brown's Peak and in a mine shaft northeast of Gleeson.

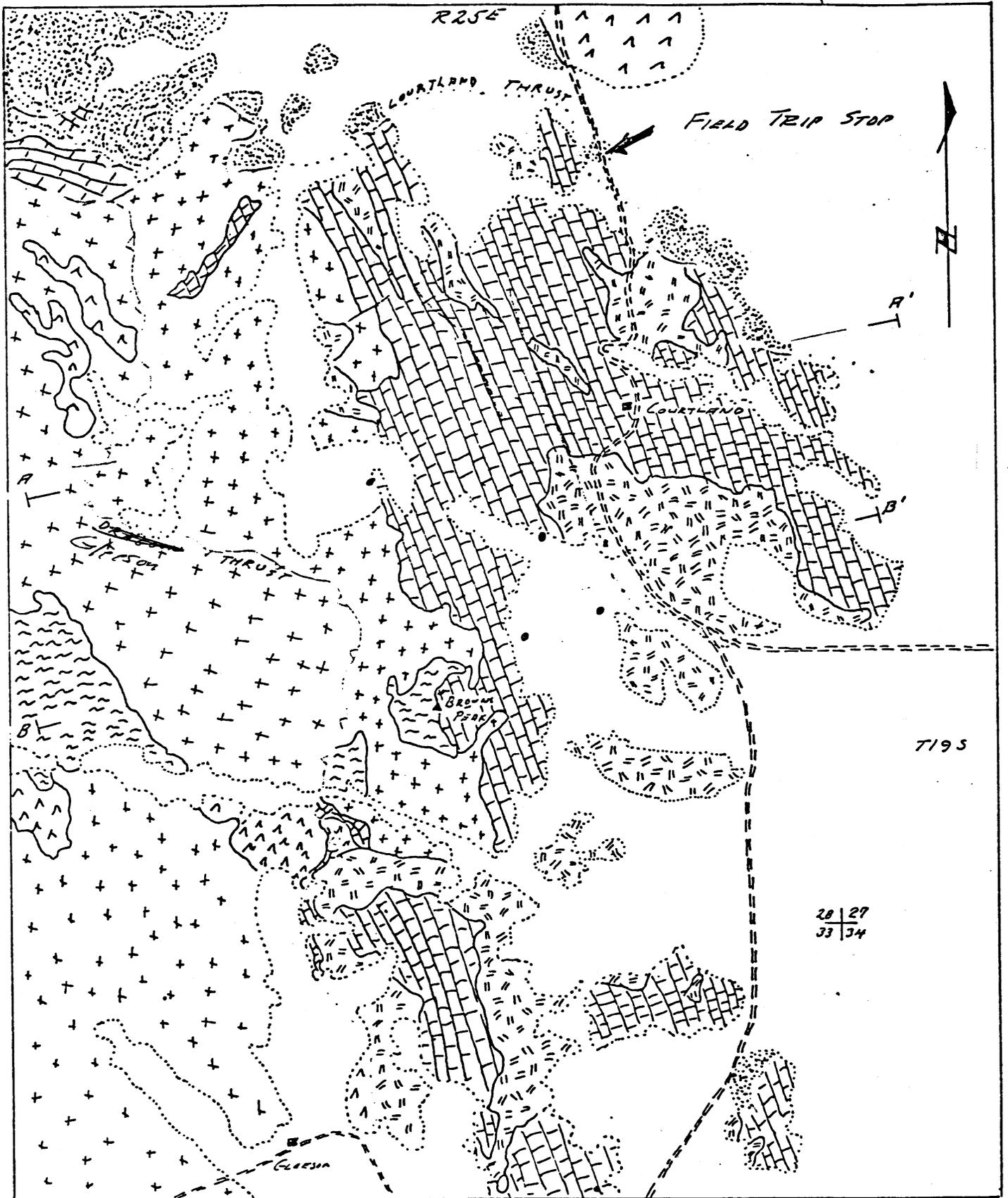
The numerous low-angle faults suggested that the mineralization exposed in the Copper Belle monzonite porphyry and the adjacent Paleozoic limestones might be related to a large porphyry deposit farther to the west below any one of the several faults. On that basis, Bear Creek re-entered the district in 1968 and drilled ten deep holes west of the ridge. They were later joined by several joint venture partners. This subsequent deep drilling has shown several apparent



COURTLAND- GLEESON AREA
CROSS-SECTION

EXPLANATION

-  TERTIARY VOLCANICS
-  CRETACEOUS SEDIMENTS & VOLCANICS
-  COPPER BELLE MONZONITE PORPHYRY
-  GLEESON QUARTZ MONZONITE
-  PALEOZOIC SEDIMENTS
-  PINAL SCHIST
-  THRUST FAULT
-  NORMAL FAULT
-  DRILL HOLE THAT PENETRATES COURTLAND THRUST



COURTLAND-GLEESON AREA
 (Simplified from McRee)

1 MILE

C. 1935



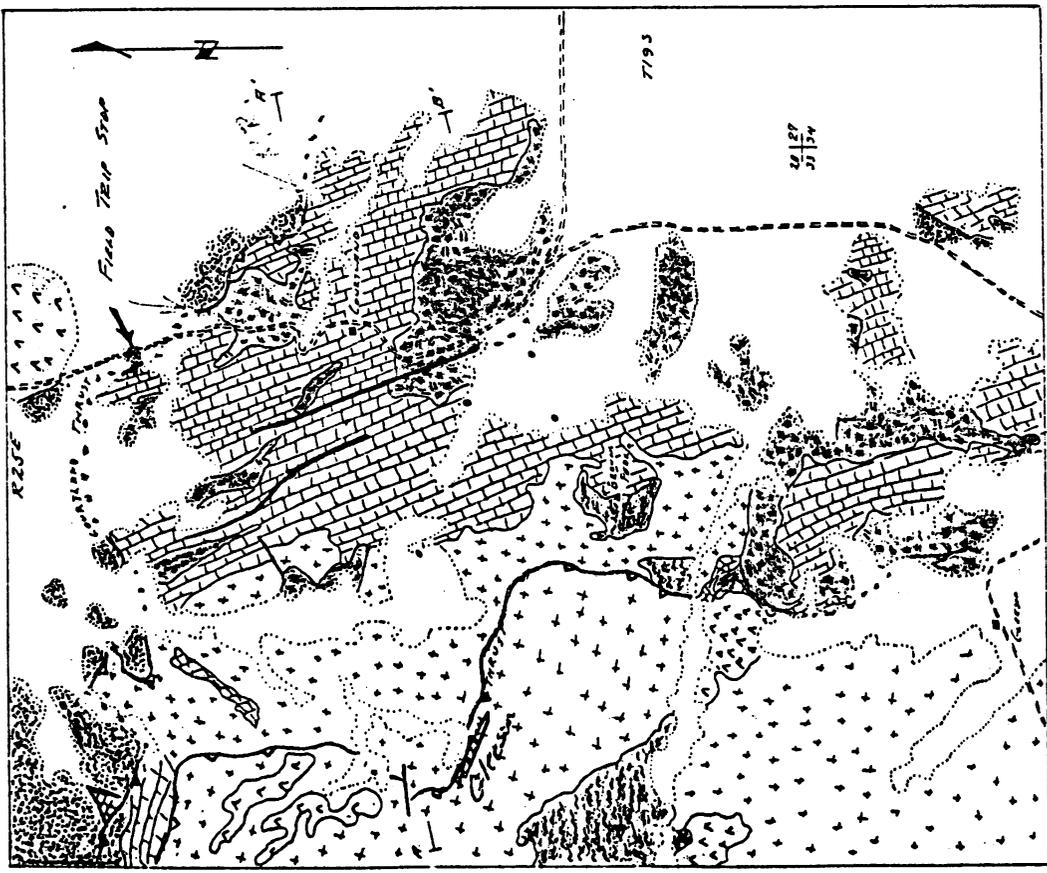
Courtesy - Geologic Board
CROSS-SECTION

C. 1935



EXPLANATION

- Tertiary Volcanics
- Cretaceous sediments of Vancouver
- Lower Paleogene Mountain Ranges
- Eastern Puget Trenchment
- Precambrian basement
- Plutonics
- Tertiary Fault
- Normal Fault
- Date Map Tectonic Features



Courtesy - Geologic Board
(Simplified from A-10)

1 mile

low-angle faults with marked changes in alteration and mineralization across the faults, but has failed to find the ore body.

Exploration in the district has been further hampered by the lack of definite age relationships between the intrusives, the mineralization, and the faulting. The Gleeson quartz monzonite has given a K-Ar date of 178 million years, but some field evidence suggests it might actually have intruded the Bolsa quartzite. No age dates have been determined for the Copper Belle monzonite porphyry which appears to be the intrusive most closely related to mineralization. The faults are younger than the Cretaceous Bisbee group rocks, but it is not yet clear whether the major movement on the faults preceded or followed the period of mineralization.

