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James Doyle Sell Mining Collection

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COURTLAND GLEESON EXAMINATION

Cochise County, Arizona

06 - 03 - 0000

DRILL HOLE NO. CG-39

COLLAR ELEV._____

Quartz Latite (Sugarloaf Type)

COPPER BELLE FAMILY

- Granite, Quartz Orb Monzonite, Rhyolite
- Dacite, Quartz Eye Dacite, Rhyodacite
- Porphyritic Latite, Daci-andesite, Monzonite
- Intrusive Breccia

UNKNOWN AGE

- Quartz Diorite
- Quartzite
- Fault Zone
- Limy Sediment

CRETACEOUS PYROCLASTICS AND SEDIMENTS

- Tuff, Igneous Breccia, Agglomerate
- Argillite, Mudstone, Calcareous Shale, Quartzite
- Limestone (and Dolomite), Chert

GLEESON QUARTZ MONZONITE

- Quartz Monzonite Porphyry
- Coarse Quartz Monzonite
- Quartz Monzonite

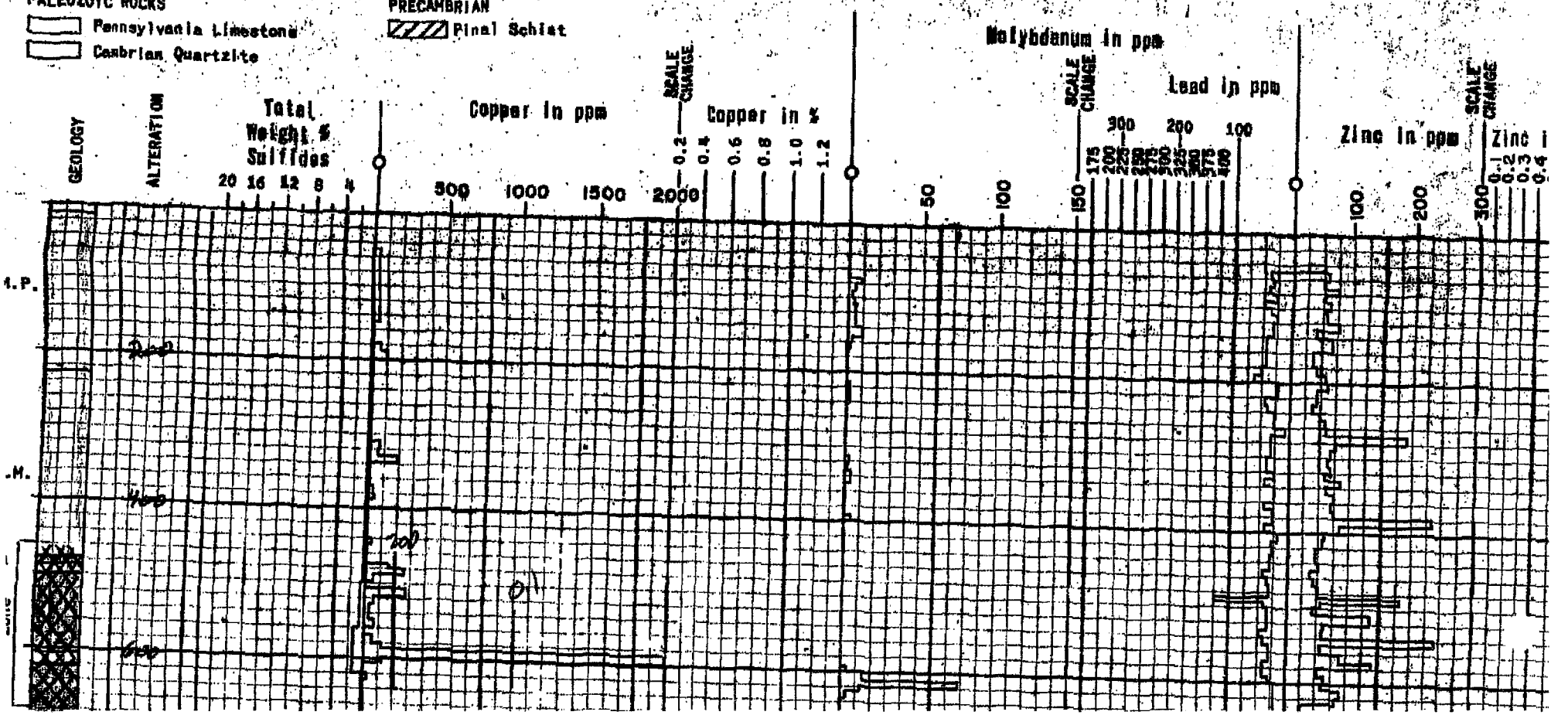
PALEOZOIC ROCKS

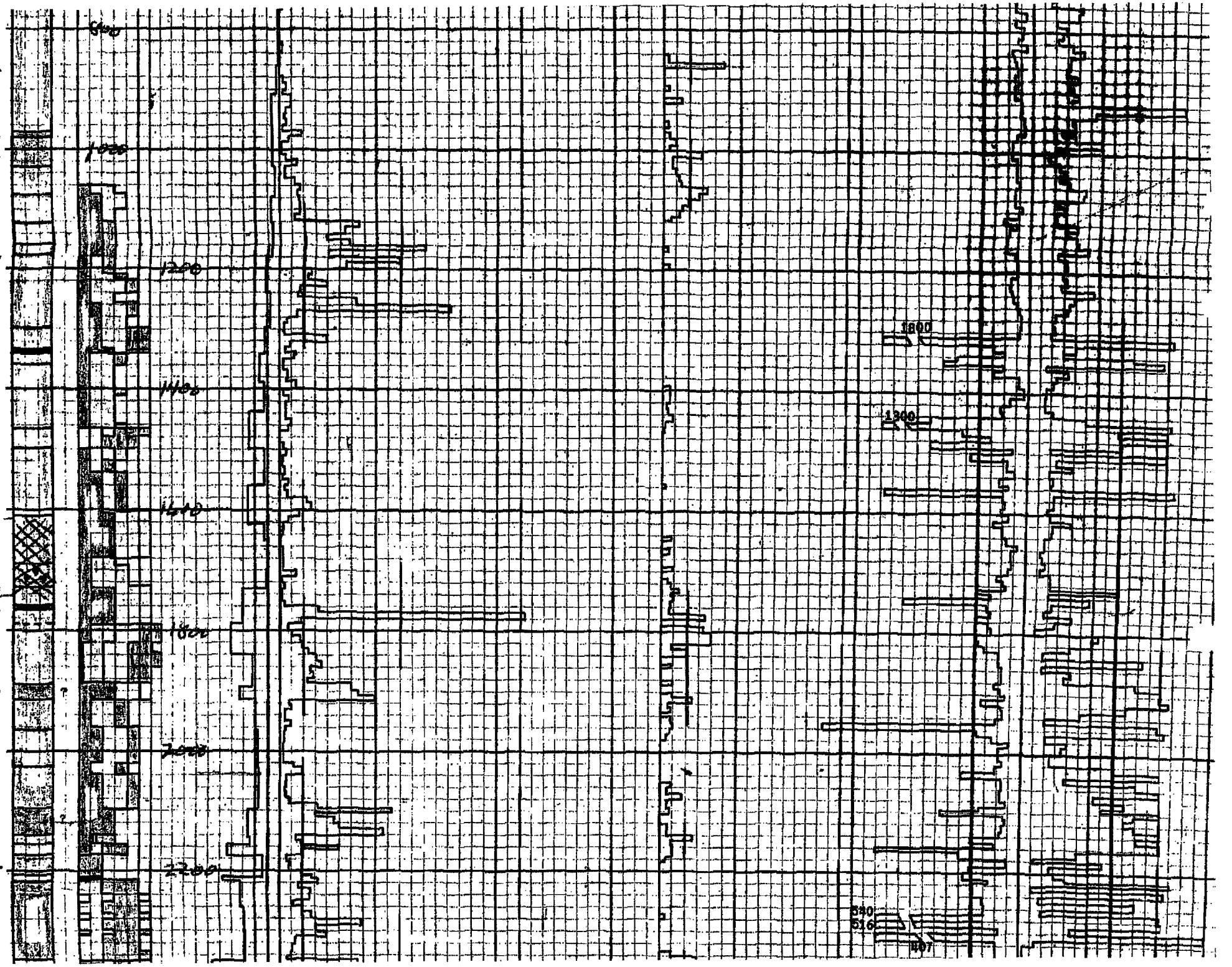
- Pennsylvania Limestone
- Cambrian Quartzite

PRECAMBRIAN

- Pinal Schist

- 3-7% Chlorite
- 8-25% Chlorite
- >25% Chlorite
- 5-10% Clay
- 10-20% Clay
- >20% Clay
- 5-10% Sericite
- 10-20% Sericite
- 20-45% Sericite
- >45% Sericite
- 1-4% Qtz. Veining and silicification
- 4-15% Qtz. Veining and silicification
- 15-30% Qtz. Veining and silicification
- >30% Qtz. Veining and silicification




Q.M.
Lat.
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Fault Zone
Dac.
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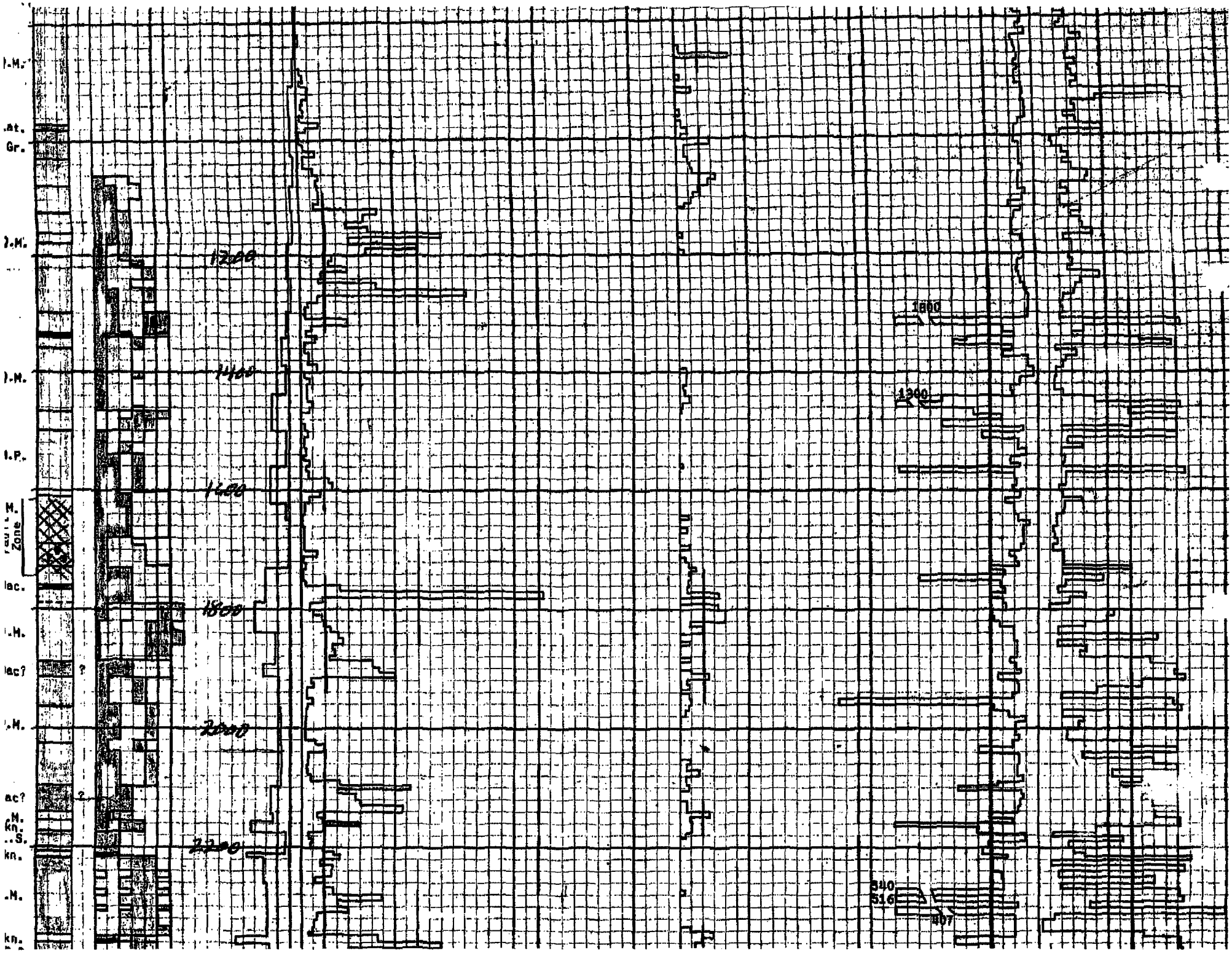
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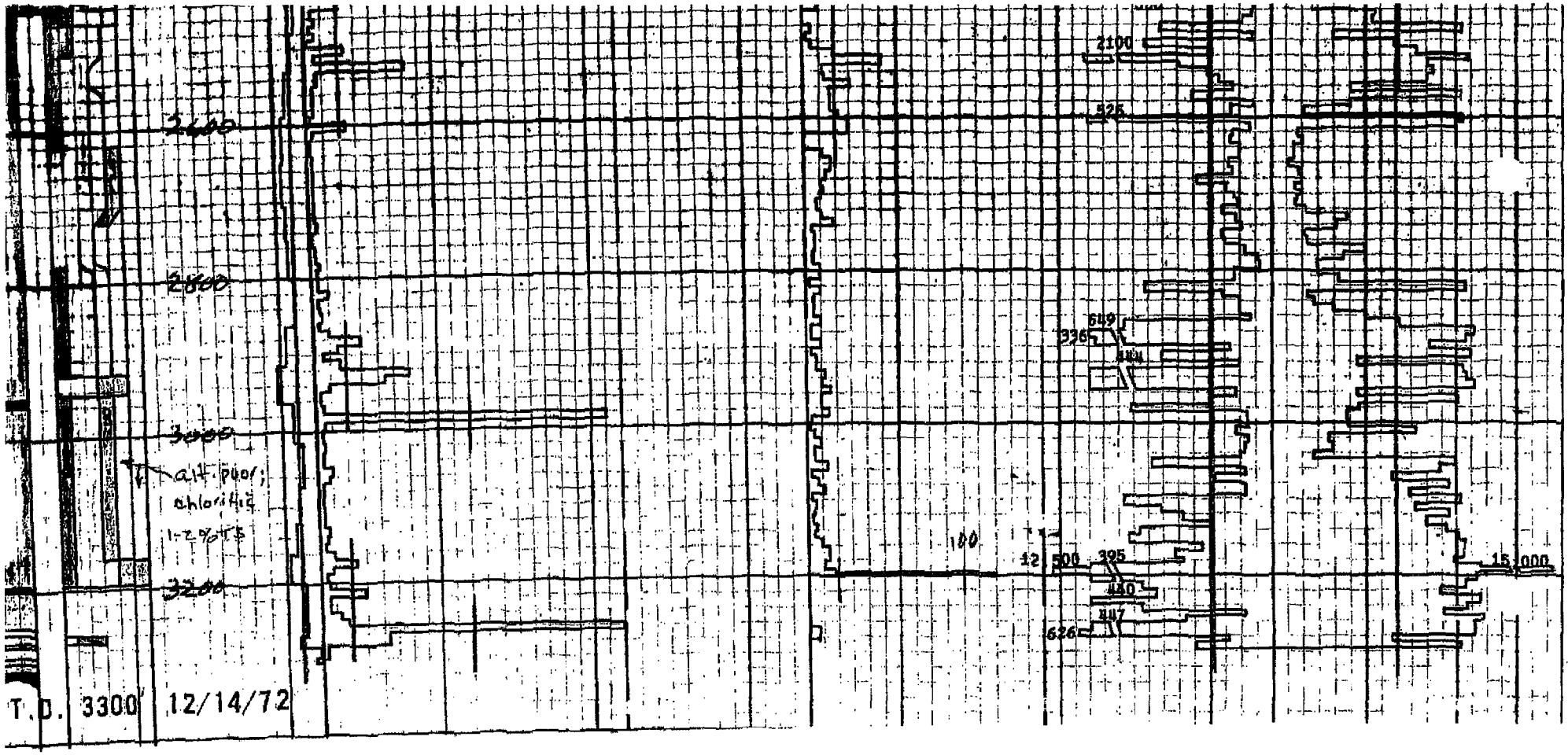
2100
526
2400
2600
649
336
3000
alt. poor;
chloritic
1-2% TS
100
12
500
395
15,000
3200
440
447
626
T.D. 3300' 12/14/72

Started: Sept 25, 1972 Completed Dec. 14, 1972

Coords: N. _____ E. _____ Collar Elev. _____ Bearing _____ Vertical Angle Vertical Total

Descriptive Location: CG-39 3300'

Objective:

Stopped Because _____ Scale: 1" = 20' Logge

Bear Creek Mining Company - Rocky Mountain District

Very broken

Core Recovery Size & Interval	% Rec.	Graphic Geology	Graphic Alteration	Graphic Mineral	Vol. % Sulf. Est.	Interval	GEOLOGY Description	Thin Section Location & Description	Interval
							Rock bit drilling. No core.		
10 NX							Quartz Monzonite Porphyry.		
20					<0.1		Medium to coarse-grained rock composed of plagioclase (35%), "orthoclase" (35%) as grains and very coarse phenocrysts, quartz (20%), chlorite after biotite and hornblende (8%), accessory f. gr. diss. magnetite (0.3%) and bladed sphene (0.2%). Proportion of "orthoclase" greater in short intervals where there are very large euhedral, subhedral and elongate anhedral poikilitic K-spar crystals and coarse groupings. Remnant biotite (1-2%) in places. Weakly magnetic. No sulfides except where noted. Plagioclase fresh except where noted. Weak calcite veining and coatings on fractures. 1% chlorite on fractures. Weathered to 25' depth and along fractures below 25'.		
2'									
30									
40									
50									50 -60
60									60 -70
70									70 -80
80					<0.1		Moderately broken 25-30', 70-78', 89-90, 94-103, 117-119'. Very broken 10-25', 64-65'.		80 -90
90					0.2		Dikes of v.f.-grained med. green daci-andesite with numerous small 1/20-1/8" rounded fragments of white calcite w. narrow coronas 118.7-119.5'. Contacts at 33° and 80° to C. Axis.		90 -100
100					0.1		Wk. epidote spotting and veining.		100 -110
110									110 -120
120 NX									120 -130

Logged By Lister - McKelvey Project Courtland-Gleeson Hole No. GC-39 Page From 970 To 1110

Mineral	Vol % Sulf Est	Interval	GEOLOGY Description	Thin Section Location & Description	Analyses Interval	Cu	Mo		Pb	Zn		Sample Nos.
		-973.5	Hybridized Quartz Monzonite (continued).		970' 980'	170	6	-	36	92		18867
	0.6		Latite. Lgt. green fine grained. Wk epidote spotting. Str. silicified. Bleached & clay altered 975-79. Wk disc. pyrite.		980' 990'	78	11		43	150		18868
	1.0		Granite. (Varied rhyolite to Quartz Orb Monzonite of Cu Belle family) Sharp igneous upper contact 75° to C. Axis. Varied texture & color. Fine to med. grained rock with 4-5% or more primary quartz. Feldspars dominated by K-spar but several intervals mainly plagioclase. Qtz orbs dominate where texture fine grained. Several coarse segregations of intergrown qtz orbs & K-spar. Primary silica exceeds 65% in places. Mod. clay alteration 981.5-984. 1% sulfides, mostly as microveins (70%) but some disseminated (30%). Traces of dissem. chalcopyrite. Several hairline veinlets of MoS_2. Hairline qtz veinlets. Not broken. Vuggy calcite veining. 3-4% chlorite as dissem. Silicification in places.		990' 1000'	35	6		43	59		18869
	1.0				1000' 1010'	33	30		45	30		18870
	1.0				1010' 1020	65	9		29	38		18871
					1020' 1029.5	165	9		27	64		18872
	0.8		Quartz Monzonite Porphyry (Gleeson). 45% plagioclase, 20% qtz, 20% K-spar, 12% chlorite. Med. grained rock w. sparse giant K-spars. Feldspars discolored to lgt. green but little clay alteration above 1050'. Non-magnetic. The original wk. diss. magnetite is now hematite. No remnant biotite — all gone to chlorite. Some chlorite veining and qtz-pyrite veining. Broken zones: Very broken 1042-1046, 1050-51, 1" crushed 65° to CA @ 1054' & 1062'.		1029.5' 1040	64	11		27	74		18873
					1040' 1050	53	14		29	64		18874
					1050' 1060	130	16		23	87		18875
	1/2%		Quartz Monzonite - Porphyry - light green & red mottled appearance: rare feldspar phenocrysts >2cm. Feldspars not completely altered to clay @ 20% of rock - giver greenish hue. No mafic vermin = chlorite @ 7%, numerous micro veinlets @ 3/inch. Chlorite and well-crystallized clay - hematite.		1060' 1070'	176	36		40	119		20501
	1½%		Fragments of silicified siltstone (reverse near end of interval). Pyrite @ micro veinlets of set by chlorite fractures.		1070' 1077'	146	29		40	112		20502
	2% 1% 2% 1% 1%	1077'	Medium gray - dense fine grained - weakly shale appearing inclusions in heavily silicified - medium crystalline quartz monzonite? - Fragments generally 1cm to 10cm in medium dark green - epidotized, pyrite with < 5% rare open space quartz veining. - Quartz Monzonite has medium gray - gray green hue with 15% 1cm quartz phenocrysts and 15% clay after feldspars, no mafics or magnetite veinlets = 10% chlorite - 3 chlorite & red hematite veinlets per foot. Fresh fragments 2" w/ pyrite - trace chalcopyrite. - weakly developed micro fracture stockwork developed pyrite veinlets set by chlorite fractures. (Quartz Eye Family)		1077' 1090'	162	20		38	60		20503
					1090' 1100'	175	16		19	72		20504
					1100' 1110'	168	13		26	54		20505

Logged By G.E. McKelvey Project Courtland - Gleeson Hole No. C.G. - 39 Page From 1110' Of To 1250'

ral	Vol % Sulf Est	GEOLOGY Interval	GEOLOGY Description	Thin Section Location & Description	Analyses Interval	Cu	Mo		Pb	Zn		Sample Nos.
	3%		Olive green - gray - dense fragment with (25%) quartz porphyry. Fragments appear to be aplite stock, with 5-7% fine disseminated pyrite, not calcareous, no visible original mafics. Rock is silicified (15%) and competent however is badly broken internally. 4 chlorite w/ ankerite fractures / foot cutting occasional pyrite veinlets.		1110' - 1120'	113	7		57	67		20506
	2%				1120' - 1125	656	1		31	94		20507
		1125	Quartz Monzonite - medium grained - "Salt-pepper" in appearance. Constituent is quartz-feldspar. light white-gray matrix with 10% dark green (chlorite) mafics.		1125' - 1130	638	1		31	104		20508
	1/2%		Chlorite coated fractures common (5-7 / foot) and all original mafics converted to chlorite => 15% of rock by volume. Trace ankerite appearing fractures. most of feldspars are still fresh - although 5% clay alteration is present as minor cloaking of plagioclase phenocrysts.		1130' - 1140'	534	3		43	80		20509
	1%		rock is generally quite competent, only occasionally broken.		1140' - 1150'	394	1		45	100		20510
	1/2%		Pyrite with trace of quartz veinlets are offset by chlorite bearing fractures.		1150' - 1160'	588	<1		45	112		20511
	1/2%		No fragments until 1162'									
		1160	Fragmental rock Quartz Monzonite where fragments are within pyrite (2-5%) epidote (5%) and chlorite (1-2%)		1160' - 1170'	1200	6		45	128		20512
	2%		Several open space quartz veins and 1 thick (6") milky quartz vein at 1167'. No original mafics or magnetite remain.		1170' - 1180'	438	<1		31	64		20513
	1/2%		3 aplitic veins or dikes cut the core @ 45° @ 1166'. epidote veining (30%) at 1175' chalcopyrite @ 1164'									
		1180	Gradational into non fragmental "Salt & pepper" Quartz Monzonite		1180' - 1190'	978	1		21	80		20514
	1/2%		5-7% clay alteration, primarily after plagioclase phenocrysts. All mafic minerals are now chlorite (7-10%) with									
	1/2%		3-4 chlorite bearing fractures per foot. reddish - hematite rich fractures present (1-2 / foot)		1190' - 1200'	550	7		28	76		20515
	1%		pyrite veining @ 45° to core axis - generally straight although some irregular - wavy veins are rarely present. Pyrite also present as fine disseminations. No silicification.		1200' - 1210'	271	<1		28	70		20516
	1%		@1210 epidote veining (2%) veining common with slight silicification of groundmass present, quartz veining increasing to 2 / foot.		1210' - 1220'	247	<1		36	82		20517
	1%		clay alteration increasing to 25% of rock which makes rock soft and incompetent.									
	1/2		Short intervals where quartz veining is more abundant 5 / foot and 10% silicification begins to destroy the matrix texture of the rock.		1220' - 1230'	399	<1		36	76		20518
	1/2		Pyrite still dominantly fracture controlled and occurs 2 / foot generally 1/8 - 1/4 inch wide and remarkably straight. not a stock working of pyrite veins, but rather 45° bisect from core horizontal.		1230' - 1240'	177	<1		31	140		20519
			quartz blebs (phenocrysts) are 15-20% of rock in places. groundmass increases in fracturing, chlorite fractures 5%		1240' - [illegible]	148	<1		31	90		20520

Logged By _____ Project _____ Hole No. _____ From _____ To _____

Mineral				Vol % Sulf Est	GEOLOGY Interval	GEOLOGY Description	Thin Section Location & Description	Analyses Interval	Cu	Mo		Pb	Zn		Sample Nos.
				1½		Medium crystalline - light gray Quartz Monzonite Quartz phenocrysts in 1/16 - 1/8 rock blocky one 10-15% of rock partly altered feldspars @ 65% and chlorite after mafic minerals represent 15%		1250' – 1260'	644	<1		26	86		20521
				2%		chlorite coated fractures have decreased to 2-3/foot while clay alteration of the feldspars remains 15% of rock - occasional very short intervals of 20-25% clay alteration		1260' – 1270'	1400	<1		24	80		20522
				1½		1270 - Veinlets margin to the veins quartz veining as near vertical - irregular - waviness % rock variable are increasing in abundance to 6-7/foot - still not a "random" stockwork. possibly a trace of schistosity especially near veins		1270' – 1280'	157	<1		21	58		20523
				1½		red stained fractures becoming more abundant (4 per foot) clay alteration of feldspars common adjacent to veins. Rock in total is 10-15% clay chlorite after mafics is 10% and slightly bleached in color. Pyrite is an occasional vein or also finely disseminated quartz veining decreasing to 1300'		1280' – 1290'	84	1		21	50		20524
				1%				1290' – 1300'	52	1		23	59		20525
				2%	1300'	medium grained light to medium gray Quartz monzonite (as above) Alteration is variable as changing the rock texture in short 1-2 foot intervals		1300' – 1310'	62	4		23	42		20526
				1%		1318 - quartz, pyrite, chalcopyrite, sphalerite, enargite? vein @ 80° from horizontal sericitic - dark rock light - 1/4-1/2 in sphalerite, chlorite common		1310' – 1320'	400	3		1800	450		20527
				1%		areas of stronger quartz veining approaching true stockwork where chlorite and all other mafics between the veins are destroyed. Clay is present up to 15% of the feldspars 5-10% sericitization. These zones are at 1300, 1309, 1319, 1325, 1326		1320' – 1330'	81	3		75	107		20528
				2%		Between the silicified zones the chlorite (10%) is stable and chlorite and RO hematite fractures are common, clay after feldspar is 10-15% of rock.		1330' – 1338'	42	3		49	73		20529
				1%											
				5%	1338'	fault gouge 75% chlorite, 50% clay trace amounts of calcite		1338' – 1344	127	1		144	227		20530
				1%	1344'	Quartz Monzonite - medium grained - light gray color with rare biotite with pinal? fragments chlorite after mafics and on fractures equals to 7-8% of rock. clay after feldspars still averaging 15% of rock		1344 – 1350	112	1		176	270		20531
				1½				1350' – 1360'	34	1		49	39		20532
				2%		1360-1364 - Dark Brown Dike with 1/8" plagioclase feldspar phenocrysts set in finely crystalline groundmass - Cappa Bell formity - contacts of dike at margin Silicification, especially near microquartz veins averaging 5% while 1/16" quartz veins (true but sparse stockwork) 5-8 per foot on occasional open spaced quartz veins.		1360' – 1370'	34	1		70	87		20533
				1½		Allover two stages of pyrite veining Red stained fractures still present		1370' – 1380	79	6		19	60		20534
				2%		chlorite @ 7% rock is becoming slightly more bleached, is approximately [illegible]		1380' – 1390	69	3		23	54		20535

Logged By _____ Project _____ Hole No. _____

Mineral	Vol % Sulf Est	Interval	GEOLOGY Description	Thin Section Location & Description	Analyses Interval	Cu	Mo		Pb	Zn		Sample Nos.
	3½		medium gray porphyritic feldspar - chlorite monzonite texture well well preserved. clay alter feldspars in the predominate altered to 2302 some have a greenish hue = illite calcite microveining = 1/3 flat		2370' - 2380'	406	9		72	456		20639
	4											
	3		pink (K-spar?) veining common 2364 - 2379 - staining try on core from 2364 → chalcocrite not K-spar. quartz veins are rare 1/3 flat but do have ½ inch selvage with sericite		2380' - 2390'	376	1		129	439		20640
	3											
	4		There is a slight preferred orientation of veins (30° to core) for both pink and white		2390' - 2399	731	<1		70	417		20641
	3½		Sericite alter biotite = 1-2% trace									
	7	2399'	Fault - zone chloritized porphyritic quartz monzonite similar to interval above, but 1/8 inch white sericite, calcite (sparse) veining shearing more horizontal		2399' - 2406'	1300	3		269	348		20642
	3	2406	white Conglomerate unit with dark heavy bands more horizontal calcite still present as well as calcite veining Pyrite is dominant mineral in dark bands.		2406' - 2417	478	3		242	439		20643
	7		Second zone (2414 - 2417) are a pure white - tale spaning calcareous limestone. clay is present in amounts up to 10% considerable shearing present and some brecciation - solution features occasional sphalerite									
	3				2417' - 2427'	1000	1		172	457		20644
	3½	2427'	Light gray-green Sericite Conglomerate, chlorite (40%) clay 15%, calcite, chalcocrite		2427' - 2435	550	23		556	1400		20645
	4											
	3	2435	medium Dark Gray feldspar porphyry Copper Belle Family chlorite veining (15% of rock) with [illegible] calcite veining present pink chalcocrite (Sericite???) veining abundant, 8%		2435 - 2440	41	9		31	206		20646
	4		feldspars - strongly to completely altered (15-20%) fresh silicification & quartz veining quite rare (<1%)		2440' - 2450'	202	6		59	225		20647
	3		Sericite pseudo (7%) but hard to distinguish - looking other [illegible]									
	3		Pink veining (chalcocrite) effervesces with 10% HCl - occurs as veins chalcocrite @ 2446, at 2450 the vein [illegible] moving from the vein for an inch on each side. Sericite and [illegible] occur with veining		2450' - 2460'	37	9		26	68		20648
	3½		Rhyodacite Porphyry. Non-magnetic. Med. to lgt. grey f. grained rock w. 15-20% subhedral Xtals of white feldspar. See more detailed description on page 19.		2460' - 2470	75	<1		29	165		20649 20649
	2.5				2470 - 2480	48	<1		47	161		20650
					2480 - 2490	76	6		181	440		20651
	2.5				2490 - 2500	37	3		29	100		20652
			Very broken 2498 - 2504 and some lost core. Apparently a steep, minor fault. Steep, calcite-lined cavities w. v. minor chalcopyrite around 2504. Clay coating slips @ 20 - 28°		2500 - 2510	240	6		203	196		20653

Logged By W. Lister Project [illegible] Hole No. [illegible] Page From [illegible] Of To [illegible]

General Galena			Vol % Sulf Est	Interval	GEOLOGY Description	Thin Section Location & Description
			2.5		Rhyodacite Porphyry. Non-magnetic. Med. to light grey fine-grained rock with 15-20% subhedral crystals of	
			2.5		white feldspar 1/8-1/3" in size (mostly 1/4" or less), and 7% yellow-brown bleached	
//			7		biotite or green chlorite pseudomorphs after	
			3		hornblende. The very siliceous matrix	
//					appears fresh. A very few, rare eyes	
					of quartz (1% or less). The feldspar	
					phenos are moderately (to strongly)	
					altered to clay:— some have their	
					central area replaced by pink material	
					(pink epidote). Thin veinlets of dark	
					chlorite, yellow-green epidote, calcite	
			3		and pink epidote are present in	
					moderate abundance (6%).	
					The % and size of feldspar phenos	
					has lessened significantly below 2504 ft.	
					but has increased to normal by 2560 ft.	
					Several sub-parallel veinlets (1/2"-1") of	
					brown, clayey material with strong sphalerite,	
					galena, pyrite and lesser chalcopyrite (2528-2530.5') admixed with some calcite and	
			3		quartz stringers. Most veinlets 12°-15° to C.A.	
					2" zone of strong galena-cpy within qtz veins	
			4		approx. 45° to C.A. @ 2538'.	
					V. strong steep fracturing 2544.5-2545.5 w. strong hydrothermal clay alteration.	
					Clay -- 15-20%	
			3		Chlorite - mostly vein - 3%	
					Sericite - minor	
					Silicification - more evident than above.	
					Interval 2602-2604' has feldspar phenos gone to dk green color & has 4% finely disseminated sulfides of which 20% is chalcopyrite. Inclusion? or alteration near steep structure?	
					Fracturer @ 20° between 2635-36' are coated w. calcite crystals.	
			3.5		Almost all sulfides are finely disseminated. Below 2619' contains 3-5% small quartz	

Analyses ppm Interval	Cu	Mo		Pb	Zn		Sample Nos.
2510-2520	79	20		96	231		20654
2520-2530	603	49		2100	600		20655
2530-2540	48	11		140	254		20656
2540-2550	50	13		100	262		20657
2550-2560	34	30		86	251		20658
2560-2570	25	16		59	129		20659
2570-2580	28	18		127	475		20660
2580-2590	27	17		25	128		20661
2590-2600	20	23		64	56		20662
2600-2610	220	29		525	590		20663
2610-2620	22	29		34	300		20664
2620-2630	10	<1		61	44		20665
2630-2640	10	1		66	50		20666
2640	11	10		52	38		20667

Logged By G. Lister Project Courtland-Gleeson Hole No. CG-57 From 2790 To 2930

Mineral Sphalerite	Mineral Galena	Vol. % Sulf Est.	GEOLOGY Interval	GEOLOGY Description	Thin Section Location & Description
		3.5		Rhyodacite Porphyry (continued). Many fresh, flashy feldspar phenocrysts. Strongly veined by pink mineral (pink epidote) and lesser yellow-green epidote. Weak to moderate clay alteration. No sericite (?).	
		4		Moderate to weak calcite veining. Alteration seems to lessen w. depth. Wk. to moderate chlorite – as dissem. after very sparse biotite and as a minor constituent of epidote-calcite veins. Much of the original biotite is now tan sericite.	
		4		Interval 2834'-39.5' without pink veining but appears similar otherwise. Intense pink veining below this for 10' or so. No pink veining 2870'-2880'. Chlorite veining 2875-75.6'.	
				1/16" veinlets of sphalerite-galena (minor cpy) w. pink epidote 18° to C.A. 2880.8', 2882.5', 2883', 2885'.	
				3% dissem. black tourmaline "clots" assoc. w. pyrite 2917-2918'.	
1/1	1/1			Intensely silicified 2918-2919.4'.	
				2919.4'-2943.8' intensely altered rhyodacite porphyry w. med. green altered feldspar phenos in sericitized groundmass. Contains irregularly distributed thin chalcopyrite veinlets and some thin quartz veinlets.	
		3			

Analyses Interval	Cu	Mo		Pb	Zn		Sample Nos.
2790-2800	26	9		20	74		20694
2800-2810	29	9		57	77		20695
2810-2820	26	3		57	110		20696
2820-2830	72	9		207	740		20697
2830-2840	23	6		78	56		20698
2840-2850	27	6		50	70		20699
2850-2860	33	6		50	102		20700
2860-2870	20	10		33	156		20701
2870-2880	92	4		240	209		20702
2880-2890	272	4		649	1200		20703
2890-2900	131	9		336	690		20704
2900-2910	40	4		68	253		20705
2910-2920	137	7		179	1000		20706
2920-2930	600	7		48	138		20707

Logged By G. Lister Project Courtland-Gleeson Hole No. CG-57 Page From 2930 To 3030

Mineral	Vol % Sulf Est	Interval	GEOLOGY Description	Thin Section Location & Description	Analyses Interval	Cu	Mo		Pb	Zn		Sample Nos.
	3		Rhyodacite Porphyry. Intensely altered to 2943.8' immediately above a fault zone. Fault apparently has attitude approx. 23° to C.A. Rock below 2943.8' is only weakly to moderately altered and has no chalcopyrite veinlets.		2930 -2940	435	13		366	570		20708
					2940 -2950	70	10		535	760		20709
	2				2950 -2959	25	16		414	1100		20710
			Med. to light grey fine-grained rock w. 15% feldspar phenos & 3-7% small quartz phenos. Some of the feldspar phenos are quite fresh but others are moderately clay altered. Groundmass is very siliceous.		2959 -2970	27	9		56	136		20682
	2				2970 -2980	40	10		101	452		20683
	3		10% or less clay. 3% qtz veining. 5% calcite veining 3% chlorite as dissem. & veinlets. (8% pink epidote veinlets & flooding.)		2980 -2990	1900	14		231	139		20684
					2990 -3000	49	4		38	118		20685
	2		Inclusions of much more altered latite or rhyodacite porphyry w. ragged, med.-green, illitic-sericitic feldspar phenos 2983 (51° to CA) - 84, 2987.5 - 90.4 (50° to CA) and 3% diss. pyrite. 3½" zone @ 58°-65° to C.A. @ 2989' w. strong pyrite-chalcopyrite in qtz vein.		3000 -3010	31	3		38	122		20686
					3010 -3020	30	6		59	234		20687
	2				3020 -3030	34	9		38	90		20688

Logged By G. Lister Project Courtland Gleeson Hole No. CG-39 Page From 3170 To 3300

Mineral: Sphal.	Mineral: Galena	Vol % Sulf Est	Interval	GEOLOGY Description	Thin Section Location & Description
				Rhyodacite Porphyry (continued) Moderately clay-altered phenocrysts. Irregular texture (some v. fine-grained) from 3180–3196'. A few calcite stringers ⊥ to contact. Sharp intrusive contact 50° to C.A. w. some diss. galena.	
			-3196		
		2.0		Limestone. Skarned & discolored red & green tones w. strongly dissem. sphalerite & galena to 3199'. Silicified to 3199'. Very crushed & gouged 55°–72° to C.A. 3199'–3200'. Strongly sheared @ 65° 3201.5–3202 w. later(?) faulting 18°. Moderately sheared & broken 3202–3204. V. broken 3207–8. Unit is limestone w. several v. thin shaley interbeds. Near base several distinct beds of light green calcareous shale become more evident e.g. 3246.5–3253, 3260–62, 3263–64.5. Some recrystallization of the limestone is evident but no real skarning observed below 3199'. Light to med. grey color with sedimentary features still evident. Broken & bleached in places with weak sulfide veining.	
		1.7			
		0.6	-3264.5	Crushed & broken at & near base.	
				Rhyodacite dike(et?) in crushed zone in quartzite, broken itself but less than adjacent rock.	
		0.6	-3273	Quartzite and/or silicified shale. Crushed top and cataclastic texture near base. 90% qtz.	
		0.6		Calcareous Shale. Lgt. green color. Calcite veining, especially near top. Fine, nodular limestone "balls" near base.	
		1.0		Limestone. Lgt. green to lgt. grey, argillaceous. Recrystallized & calcite-veined intervals w. moderately dissem. pyrite & fine veinlets of sphalerite & galena. Apparently slightly less altered but still has pyrite veining @ 3300'.	
				END OF HOLE	
				Hole stopped due to steep structure @ 3300' bending core barrel.	

Analyses

Interval	Cu	Mo		Pb	Zn		Sample Nos.
3170–3180	223	14		159	590		20721
3180–3190	67	10		145	298		20722
3190–3196	27	17		395	1600		20723
–3199	24	122		12,500	15,000		20724
3199–3210	47	<1		440	1,300		20725
3210–3220	270	<1		213	660		20726
3220–3230	35	<1		188	270		20727
3230–3240	36	<1		308	1500		20728
3240–3250	111	<1		215	690		20729
3250–3257	152	<1		46	275		20730
3257–3264.5	2000	<1		144	1900		20731
3264.5–3273	420	6		447	1100		20732
3273–3281.4	420	6		626	1200		20733
3281.4–3290	15	1		74	190		20734
3290–3300	15	<1		126	410		20735

BEAR CREEK MINING CO., SW DISTRICT

COURTLAND GLEESON WEST EXAMINATION
COCHISE COUNTY, ARIZONA
06 - 03 - 0000

HOLE NO CG-35

COLLAR ELEV. 4960'

DEPTH	GEOLOGY		Copper (PPM)	MoS_2 (PPM)	
0					Dump material & overburden.
		OXIDE	10	10	Qtz monzonite - coarse grained 4-10mm w/some k spar crystals to 30mm. weak propylitic alteration, epidote & chlorite replacing mafics (biotite). plagioclase altered to clay, K-spar is fresh. pyrite <0.5 vol %, magnetite 0.75 vol %
100			29	115	
			19	1	
			11	5	Qtz latite porphyry - 8% qtz "eyes" 4mm dia. 8% feldspar 5mm, in aphanitic red groundmass <0.5% cubic pyrite Intense contact
200			26	1	
			110	7	Qtz monzonite, bleached, w/cataclastic texture, sparse pyrite 0.5%, trace chalcopyrite in qtz-py vein @ 218'
			48	15	Breccia - angular to sub-rounded fragments, 1mm to 5cm predominantly, limestone w/mirror quartzite & quartz monzonite, some mineralized, in limy matrix. locally re-brecciated by faulting
300			76	18	
					Quartzite - brown, thin bedded, broken, Gb?
					Breccia, similar to 248.7-303.5'
			63 0.12% Pb	15	Fault gouge & breccia
400					
			49	10	Qtz monzonite, medium grained 2-5mm, plagioclase mod. to strongly argillized, K-spar slightly to moderatly argillized, biotite altered to chlorite. rare traces epidote, no magnetite.
			48	5	Pyrite 0.5-1%, as dissem. grains at mafic sites, strongly fractured, local cataclastic texture. alteration more intense in sheared rock.
500					
			90	5	
					Frequent pink qtz-K-spar veins up to 5cm.
			44	120	Massive pyrite veins @ 548-549 & 580-581' in fault gouge zones.
			56	5	
			96	7	
			45	10	
			52	55	
600			54	<1	
		SULFIDE	36	18	Qtz monzonite, fresher than above, plagioclase weakly argillized, K-spar fresh biotite chloritized. Pyrite 0.5 vol %
700					Qtz. monzonite, weak to moderate argillic alteration of plagioclase, K-spar slightly frosted.
			146	38	Biotite altered to chlorite. Pyrite 0.5-1 vol. %.
					cut by K-spar + qtz. veins, possibly alaskite dikes, at 765,767,769,779,783,787, width from 2-10cm.
			130	16	
800					
			114	5	
			172	17	Qtz monzonite, moderate argillic alteration of feldspar; biotite chloritized; pyrite 1 vol. %.
			111	2	
			80	12	at mafic sites and in rare veinlets

NCWL

		19	1	
		11	5	Qtz latite porphyry - 8% qtz "eyes" 4mm dia. 8% feldspar 5mm, in aphanitic red groundmass <0.5% cubic pyrite
200		26	1	Intense contact
		110	7	Qtz monzonite, bleached, w/cataclastic texture, sparse pyrite 0.5%, trace chalcopyrite in qtz-py vein @ 218'
300		48	15	Breccia - angular to sub-rounded fragments, 1mm to 5cm predominantly, limestone w/mirror quartzite & quartz monzonite, some mineralized, in limy matrix. locally re-brecciated by faulting
		76	18	
				Quartzite - brown, thin bedded, broken, Gb?
				Breccia, similar to 248.7-303.5'
400		63 0.12% Pb	15	Fault gouge & breccia
		49	10	Qtz monzonite, medium grained 2-5mm, plagioclase mod. to strongly argillized, K-spar slightly to moderatly argillized, biotite altered to chlorite. rare traces epidote, no magnetite.
500		48	5	Pyrite 0.5-1%, as dissem. grains at mafic sites. strongly fractured, local cataclastic texture. alteration more intense in sheared rock.
		90	5	
				Frequent pink qtz-K-spar veins up to 5cm.
		44	120	Massive pyrite veins @ 548-549 & 580-581' in fault gouge zones.
		56	5	
		96	7	
		45	10	
		52	55	
600		54	<1	
	SULFIDE	36	18	Qtz monzonite, fresher than above, plagioclase weakly argillized, K-spar fresh biotite chloritized. Pyrite 0.5 vol %
700				Qtz. monzonite, weak to moderate argillic alteration of plagioclase, K-spar slightly frosted.
		146	38	Biotite altered to chlorite. Pyrite 0.5-1 vol. %.
				cut by K-spar - qtz. veins, possibly alaskite dikes, at 765,767,769,779,783,787, width from 2-10cm.
		130	18	
800				
		114	5	
		172	17	Qtz monzonite, moderate argillic alteration of feldspar; biotite chloritized; pyrite 1 vol. %.
		111	2	
		80	12	at mafic sites and in rare veinlets.
		88	12	
		89	<1	K-spar - qtz. veins (alaskite dikes) at 813,819,837,842,844-846.6'.
900				Alaskite - coarse grained 5-10mm pink orthoclase, 2-3mm qtz. & 1-2mm plagioclase, some perthitic intergrowth. Pyrite 0.5-1 vol.%
		125	10	Qtz. monzonite, moderate argillic alteration Pyrite 0.5-1 vol. %
		58	10	Aplite? pale brownish gray, faint granular texture 1mm or less, traces chlorite & sericite on fractures. Pyrite 0.5-1 vol. %
		31	23	
		25	7	Qtz. monzonite, moderate argillic alteration,
		65	17	pyrite 1-1.5 vol. %, as dissem. grains at former
1000		59	18	mafic sites & rare 1mm veinlets.
		39	77	
		42	77	Alaskite dikes at 960' (6"), 964' (4").
		190	18	Aplite dikes at 974-976,978,982,984'. (3-12")
		40	5	
		26	15	Qtz. monzonite, feldspars moderately altered to sericite,
		35	10	chlorite sericitized, Pyrite 1-1.5 vol. %.
		30	23	Aplite dike.
		62	15	
		71	7	Qtz. monzonite, similar to above. Pyrite 1-1.5 vol. %,
1100		577	15	first chalcopyrite in bleb at 1072.4' w/pyrite vein.
		439	10	increasing to 1-2% pyrite, 0.1% chalcopyrite
		0.13%	2	at 1091.5, mainly fracture controlled.
		262	5	
		346	2	Cataclastic texture - chalcopyrite increases to 0.3%
		728	148	
		0.04%	50	Qtz. monzonite - similar to 1091.5-1102.8'

NCWL

Depth		Cu	Zn	Description
1000		59	18	mafic sites & rare 1mm veinlets.
		39	77	
		42	77	Alaskite dikes at 960' (6"), 964' (4").
		190	18	Aplite dikes at 974-976.978,982,984'. (3-12")
		40	5	
		26	15	Qtz. monzonite, feldspars moderately altered to sericite,
		35	10	chlorite sericitized, Pyrite 1-1.5 vol. %.
		30	23	*Aplite dike.*
		62	15	
		71	7	Qtz. monzonite, similar to above. Pyrite 1-1.5 vol. %,
1100		577	15	first chalcopyrite in bleb at 1072.4' w/pyrite vein.
		439	10	Increasing to 1-2% pyrite, 0.1% chalcopyrite
		0.13%	2	at 1091.5, mainly fracture controlled.
		262	5	
		346	2	*Cataclastic texture* - chalcopyrite increases to 0.3%
		728	148	
		0.04%	50	Qtz. monzonite - similar to 1091.5-1142.8'
		0.48%	tr	
		0.37%	tr	Dark gray qtz monzonite ? coarse grained 8-10mm,
		0.68%	33	Qtz 10-15%, feldspars 60%, mafics 25%.
1200		0.56%	tr	feldspars mod. to strongly altered to sericite, mafics sericitized
		0.17%	33	pyrite 3-4 vol. %, chalcopyrite 1% as blebs & flakes on
		0.55%	tr	fractures. Cataclastic texture.
		0.05%	tr	
		0.21%	33	
		0.08%	tr	
		80	40	Qtz monzonite medium grained (4-6mm) equigranular
				Qtz 15%,K spar 35%, plag. 35%, biotite (chloritized) 15%.
				Feldspars weakly argillized; chlorite lightly sericitized.
				chlorite abundant on fractures w/traces epidote.
1300				Strongly fractured. Pyrite 0.5-1 vol. %.
		245	7	Little or no magnetite.
		496	7	
1400				
		81	23	
				Qtz monzonite, increased argillic alteration - feldspars -
				mod. argillic, weak sericite; mafics partly sericitized
				Alteration related to intense fracturing & cataclastic texture.
		56	23	Pyrite 0.5-1 vol. % as dissem grains and along fractures.
				Qtz monzonite - very weak argillic alteration.
1500				Pyrite <0.5 vol. %, trace magnetite
				Hematite on fractures
		52	5	
		34	5	
		190	18	Qtz monzonite - mod. to strong sericitic alteration.
		124	1	Pyrite 1-1.5 vol %, rare blebs chalcopyrite.
		825 42	23 23	Andesite porphyry dike.
		310	15	
		410	15	Qtz monz. - mod. argillic to strong sericitic alteration
		52	10	
		96	17	
1600		84	5	Qtz monzonite - weak propylitic alteration.
				epidote 1-3%, feldspars, fresh to slightly argillized
				biotite altered to chlorite. Pyrite <0.5 vol %,
				magnetite 0.5 vol %.
		25	22	
				Qtz monzonite, mod argillic alteration of feldspars,
				pyrite 0.5 vol % as dissem. grains.
1700				Monzonite porphyry dike - Copper Belle 3-4 vol % pyrite
		97	7	contains fragments of qtz monz & alaskite.
		173	18	
		75	28	
		294	27	Qtz monzonite - alternating zones of mod. argillic
		258	23	alteration and mod. to strong sericitic alteration.
		118	10	Sericitic alteration related to zones of
		169	7	intense fracturing & cataclastic texture.
		318	15	Pyrite 0.5-1 vol % in argillic altered rock, increasing
1800		624	10	to 3-4 vol % w/sericitic alteration.
		321		Rare specks (0.1%) chalcopyrite accompany sericite.
		91	11	
		832	9	
		157	14	
		83	16	
		62	6	Qtz monzonite - alternating sections of predom. weak
		57	11	argillic alteration w/short intervals of
1900		88	6	mod. to strong sericitization.
		272	6	Pyrite 1-1.5 vol %. Rare chalcopyrite, (0.2%)
		153	3	strongly fractured +40/ft., locally cataclastic.
		58	6	Hematite on many fractures & slip surfaces.
		70	14	
		191	4	
2000				
				Intensly fractured w/local cataclastic texure
				Hematite on many fractures. Sericitization
				[illegible] locally pervasive for short intervals

SULFIDE AND OXIDE

NXWL

NXWL

Depth	Sulfide / Oxide			Description
		496	7	
1400				
		81	23	
				Qtz monzonite, increased argillic alteration - feldspars - mod. argillic, weak sericite; mafics partly sericitized Alteration related to intense fracturing & cataclastic texture.
		56	23	Pyrite 0.5-1 vol. % as dissem grains and along fractures.
				Qtz monzonite - very weak argillic alteration. Pyrite <0.5 vol. %, trace magnetite Hematite on fractures
1500				
		52	5	
		34	5	
		190	18	Qtz monzonite - mod. to strong sericitic alteration.
		124	1	Pyrite 1-1.5 vol %, rare blebs chalcopyrite.
		825 42	23 23	Andesite porphyry dike.
		310	15	
		410	15	Qtz monz. - mod. argillic to strong sericitic alteration
		52	10	
		96	17	
1600		84	5	Qtz monzonite - weak propylitic alteration.
				epidote 1-3%, feldspars, fresh to slightly argillized biotite altered to chlorite. Pyrite <0.5 vol %, magnetite 0.5 vol %.
		25	22	
				Qtz monzonite, mod argillic alteration of feldspars, pyrite 0.5 vol % as dissem. grains.
1700				Monzonite porphyry dike - Copper Belle 3-4 vol % pyrite
		97	7	contains fragments of qtz monz & alaskite.
		173	18	
		75	28	
		294	27	Qtz monzonite - alternating zones of mod. argillic
		258	23	alteration and mod. to strong sericitic alteration.
		118	10	Sericitic alteration related to zones of
		169	7	intense fracturing & cataclastic texture.
		318	15	Pyrite 0.5-1 vol % in argillic altered rock, increasing
1800		624	10	to 3-4 vol % w/sericitic alteration.
		321		Rare specks (0.1%) chalcopyrite accompany sericite.
		91	11	
		832	9	
		157	14	
		83	16	
		62	6	Qtz monzonite - alternating sections of predom. weak
		57	11	argillic alteration w/short intervals of
1900		88	6	mod. to strong sericitization.
		272	6	Pyrite 1-1.5 vol %. Rare chalcopyrite, (0.2%)
		153	3	strongly fractured +40/ft., locally cataclastic.
		58	6	Hematite on many fractures & slip surfaces.
		70	14	
		191	4	
2000				
				Intensly fractured w/local cataclastic texure Hematite on many fractures. Sericitization becomes locally pervasive for short intervales up to 1'.
				Qtz monzonite, weak argillic alteration, biotite chloritized,
		100	<1	k spar fresh, plag. mod. argillized,
		52	7	1% epidote, trace magnetite. Pyrite 0.5-1 vol %
		72	1	as scattered dissem. cubes and on fractures.
2100		113	10	
		68	<1	
		92	3	
		353	13	
		124	7	
		110	<1	Qtz monzonite - moderately fractured, weak argillic alteration
		216	<1	calcite veining common - alteration is fracture controlled.
		71	<1	
		70	1	
		30	<1	
2200		111	<1	
		26	13	
		28	1	
		54	10	Monzonite - weakly fractured, argillized and mineralized. Calcite
		50	10	veining is common.
		48	4	
		46	10	
		45	<1	Rare chalcopyrite
		63	10	Pyrite averaging 1 - 1½%
		40	<1	
2300		38	1	Trace of epidote
		56	1	Moderate chlorite
		54	4	
		133	3	
		70	1	

NXWL

Depth	Zone			Notes
		56	23	Pyrite 0.5-1 vol. % as dissem grains and along fractures.
				Qtz monzonite - very weak argillic alteration. Pyrite <0.5 vol. %, trace magnetite Hematite on fractures
1500				
		52	5	
		34	5	
		190	18	Qtz monzonite - mod. to strong sericitic alteration.
		124	1	Pyrite 1-1.5 vol %, rare blebs chalcopyrite.
		825 42	23 23	Andesite porphyry dike.
		410 310	15 15	Qtz monz. - mod. argillic to strong sericitic alteration
		52	10	
		96	17	
1600		84	5	Qtz monzonite - weak propylitic alteration.
				epidote 1-3%, feldspars, fresh to slightly argillized biotite altered to chlorite. Pyrite <0.5 vol %, magnetite 0.5 vol %.
		25	22	
				Qtz monzonite, mod argillic alteration of feldspars, pyrite 0.5 vol % as dissem. grains.
1700				Monzonite porphyry dike - Copper Belle 3-4 vol % pyrite
		97	7	contains fragments of qtz monz & aleskite.
		173	18	
		75	28	
	SULFIDE	294	27	Qtz monzonite - alternating zones of mod. argillic
		258	23	alteration and mod. to strong sericitic alteration.
		118	10	Sericitic alteration related to zones of
		169	7	intense fracturing & cataclastic texture.
		318	15	Pyrite 0.5-1 vol % in argillic altered rock, increasing
		624	10	to 3-4 vol % w/sericitic alteration.
1800		321		Rare specks (0.1%) chalcopyrite accompany sericite.
		91	11	
		832	9	
		157	14	
	AND	83	16	
		62	6	Qtz monzonite - alternating sections of predom. weak
		57	11	argillic alteration w/short intervals of
1900		88	6	mod. to strong sericitization.
		272	6	Pyrite 1-1.5 vol %. Rare chalcopyrite, (0.2%)
		153	3	strongly fractured +40/ft., locally cataclastic.
		58	6	Hematite on many fractures & slip surfaces.
		70	14	
	OXIDE	191	4	
2000				
				Intensly fractured w/local cataclastic texure Hematite on many fractures. Sericitization becomes locally pervasive for short intervales up to 1'.
		100	<1	Qtz monzonite, weak argillic alteration, biotite chloritized, k spar fresh, plag. mod. argillized,
		52	7	1% epidote, trace magnetite. Pyrite 0.5-1 vol %
		72	1	as scattered dissem. cubes and on fractures.
2100		113	10	
		68	<1	
		92	3	
		353	13	
		124	7	
		110	<1	Qtz monzonite - moderately fractured, weak argillic alteration
		216	<1	calcite veining common - alteration is fracture controlled.
		71	<1	
		70	1	
2200		30	<1	
		111	<1	
		26	13	
		28	1	
		54	10	Monzonite - weakly fractured, argillized and mineralized. Calcite
		50	10	veining is common.
		48	4	
		46	10	
		45	<1	Rare chalcopyrite
		63	10	Pyrite averaging 1 - 1½%
2300		40	<1	
		38	1	Trace of epidote
		56	1	Moderate chlorite
		54	4	
		133	3	
		70	1	
		114	1	
		98	4	
		142	3	
		35	4	
2400		40	6	
		267	3	
		106	10	
		61	10	2420' - dark green schistose inclusion dominately chloritized.
		90	7	
		84	6	
		1400	<1	
		329	3	Monzonite - alteration and mineralization, apparently fracture
		250	<1	related, are increasing with depth. Mafics are chloritized
		124	<1	while feldspars are moderately argillized. Some quartz veining.

1800	318	15	Pyrite 0.5-1 vol % in argillic altered rock, increasing
	624	10	to 3-4 vol % w/sericitic alteration.
	321		Rare specks (0.1%) chalcopyrite accompany sericite.
	91	11	
	832	9	
	157	14	
	83	16	
	62	6	Qtz monzonite - alternating sections of predom. weak
	57	11	argillic alteration w/short intervals of
1900	88	6	mod. to strong sericitization.
	272	6	Pyrite 1-1.5 vol %. Rare chalcopyrite. (0.2%)
	153	3	strongly fractured +40/ft., locally cataclastic.
	58	6	Hematite on many fractures & slip surfaces.
	70	14	
	191	4	
2000			
			Intensly fractured w/local cataclastic texure
			Hematite on many fractures. Sericitization
			becomes locally pervasive for short intervales
			up to 1'.
	100	<1	Qtz monzonite, weak argillic alteration, biotite chloritized,
	52	7	k spar fresh, plag. mod. argillized,
	72	1	1% epidote, trace magnetite. Pyrite 0.5-1 vol %
2100	113	10	as scattered dissem. cubes and on fractures.
	68	<1	
	92	3	
	353	13	
	124	7	
	110	<1	Qtz monzonite - moderately fractured, weak argillic alteration
	216	<1	calcite veining common - alteration is fracture controlled.
	71	<1	
	70	1	
	30	<1	
2200	111	<1	
	26	13	
	28	1	
	54	10	Monzonite - weakly fractured, argillized and mineralized. Calcite
	50	10	veining is common.
	48	4	
	46	10	
	45	<1	Rare chalcopyrite
	63	10	Pyrite averaging 1 - 1½%
	40	<1	
2300	38	1	Trace of epidote
	56	1	Moderate chlorite
	54	4	
	133	3	
	70	1	
	114	1	
	98	4	
	142	3	
	35	4	
2400	40	6	
	267	3	
	106	10	
	61	10	2420' - dark green schistose inclusion dominately chloritized.
	90	7	
	84	6	
	1400	<1	
	329	3	Monzonite - alteration and mineralization, apparently fracture
	250	<1	related, are increasing with depth. Mafics are chloritized
	124	<1	while feldspars are moderately argillized. Some quartz veining.
	97	3	
2500	275	3	
	675	<1	
	147	1	
	75	<1	
	71	1	
	130	3	2550' - green schist appearing inclusion -Pinal
	100	3	
	66	11	
	52	11	Qtz monzonite - monzonite. Moderate to strong argillic alteration-
	82	15	many fractures. Trace of sericite, calcite and quartz veining
2600	102	112	present. Pyrite 2-4%, some sparce chalcopyrite.
	118	26	
	64	9	
	524	4	
	174	3	
	118	4	
	T.D. 2655 12/28/71		
2700			
2800			

SU AND OXIDE

COURTLAND GLEESON WEST EXAMINATION
COCHISE COUNTY, ARIZONA
06 - 03 - 0000

HOLE NO CG-34

COLLAR ELEV. ±5120'

DEPTH	GEOLOGY	Cu (PPM)	MoS_2 (PPM)	
0	ox			Weathered, decomposed Qtz monzonite.
		11	17	Qtz monzonite, medium grained 4-6mm equigranular: Qtz 10-15%, pink feldspar 35-40% white feldspar 35-40%, mafics (chlorite after biotite)10%
100		12	2	Epidote occurs w/chlorite. Numerous 0.5-3mm calcite veinlets on fractures. Secondary pink K-spar locally abundant in veins & irregular splotches. Rare dissem pyrite. Magnetite ±0.5%
		16	2	Well developed cataclastic texture.
200		16	2	
				Increase in secondary pink K-spar from 237'
		14 55	2 166	Pink K-spar flooding rock w/assoc epidote & calcite veining Erratic blebs & grains pyrite ±2%, small dissem books of molybdenite, few specks chalcopyrite.
300		20	10	Qtz monzonite similar to 0'-261', propylitic alteration w/abundant epidote & chlorite, abundant secondary pink K-spar, related to shearing & aplite dikes
		26	<1	Partial argillation of feldspars. Very rare pyrite
400		32	2	
		42 55 61 70 69	2 <1 <1 12 <1	Qtz monzonite or granodiorite – dark gray, mafic rich variable grain size 1-5mm, locally porphyritic composition variagle – qtz ±10%, pink-white feldspars 70-80%, mafics-hornblende & biotite altered to chlorite 10-20%. frequent rounded inclusions of qtz monz., diorite, & schist, Pyrite 0.5-2%, frequent calcite veins. Locally rock is a breccia.
500		56	<1	Qtz diorite – more homogenous than above, gray, med grained 3-6mm, equigranular, some planar alignment of mafics. Qtz 10%, white feldspar 70%, biotite 10%, pyroxene 15%
		35	2	Alteration of mafics to chlorite, slight argillation of feldspars, Frequent calcite veinlets, minor epidote. Pyrite ±0.5%, magnetite ±1%
600		31	17	Breccia – qtz monz fragments in gray aphanitic matrix. Pyrite 1-2%
		33	5	Gray aphanitic rock, shattered, w/white calcite veinlets. Possibly chilled phase of qtz diorite. Trace pyrite. Breccia & gouge – chloritized qtz diorite
700				Qtz diorite – as above
		74	12	Monzonite porphyry Qtz diorite similar to 500'-627'. Strongly magnetic rare dissem pyrite. Monzonite porphyry
		43	2	Qtz diorite as above Qtz diorite – monzonite porphyry – intermixed border phase. Frequent inclusions of qtz monzonite, aplite & mafic dike rock. Rare pyrite.
800		17	<1	Qtz monzonite – Coarse grained (8-12mm) facies 30% qtz, 40% pink K-spar, 30% white feldspar, <5% biotite altered to chlorite. Feldspars argillized along fractures.
		19	2	Rare pyrite

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SULPHIDE

		29	10	monzonite porphyry or qtz diorite.
				Qtz monzonite - coarse grained - similar to 792'-895' increased epidote & chlorite on fractures.
		38	<1	Qtz monzonite - medium grained (4-6mm) Propyllitic alteration, rare pyrite. Qtz latite porphyry dikes.
1000				Qtz monzonite - med grained (4-6mm) pyrite 0.5%
		32	5	
				Qtz latite porphyry
				Mafic dike - altered to chlorite & epidote
		58	21	
		93	17	Qtz monzonite - med grained (4-6mm) weak qtz-sericite alteration. Pyrite 0.5-2%, rare chalcopyrite, possibly some chalcocite coating on pyrite. Partly oxidized.
		108	17	
		177	32	
1100		239	103	
		129	32	
		158	50	
		121	21	
		172	32	
		44	7	Qtz monzonite - coarse grained (8-12mm) slight argillic alteration of feldspars. <0.5% pyrite fractures carry limonit stain after pyrite.
1200				Mafic dikes.
	SULPHIDE & OXIDE	181	48	Qtz monz. med grained (4-6mm) weak qtz sericite, pyrite 0.5% Mafic dike
				Qtz monzonite - med grained (4-6mm) weak to moderate qtz-sericite alteration.
		112	40	Pyrite <0.5-0.5% as dissem grains & blebs.
		193	82	Limonite stain after pyrite on fractures.
		156	60	Possibly some chalcocite film on pyrite
		98	50	rare chalcopyrite.
1300		172	124	
		128	23	Silification increases below 1324' - texture locally indistinct
		134	78	
		125	48	Pyrite 1%, rare chalcopyrite.
		98	67	
		110	103	
		138	99	
				Pyrite decreases <0.5%
1400				
		136	73	
		167	88	Mafic dike
		341	85	
		88	129	
		76	55	Quartz monzonite - similar to 1220'-1414'
		220	62	Strong fracturing
		213	68	
		248	88	
1500				Mafic dike
		229	50	Qtz monz. - similar to 1220'-1414' Pyrite 0.5-1.5%; trace molybdenite Rare specks chalcopyrite weak qtz-clay-sericite alteration, partly oxidized w/hematite-limonite stain on fractures
		110	166	
		138	41	
		242	30	
		185	132	
1600		157	41	1599' Latite porphyry inclusion
		132	55	
		112	9	Aplite dikes at 1614', 1616.5', 1650', 1660.8'
		179	26	Increase in pink secondary K-spar, chlorite & epidote
		157	134	
		146	67	
		118	32	
		134	56	Qtz Monz Porphyry, 1-3% pyrite
		96	162	sparse dissem galena near contacts
		154	35	Mafic dike.
1700		73	63	
		122	82	Qtz Monz porphyry, strongly fractured, cataclastic texture argillized feldspars, abundant chlorite & epidote.
		64	55	
		137	187	Spotty pyrite 0.5-2%, rare chalcopyrite.
		76	22	
		117	53	Qtz Monz porphyry w/large pink orthoclase phenocrysts up to 3", spotty pyrite 0.5-1.5%, rare chalcopyrite, some dissem magnetite
		78	43	
		48	5	
		135	11	
		122	13	Fault zone, strong fracturing between narrow gouge zones
1800		94	6	
DEPTH 1815' 6/15/71		74	15	
		176	15	Qtz Monz. equigranular (2-4mm).
		117	65	Propyllitic-argillic alteration, some epidote, abundant
		177	10	chlorite, argillezed feldspars.
		152	62	Cataclastic texture. Pyrite 0.5-1.5% assoc. w/epidote.
		122	39	No visible copper or moly.
		212	22	
		177	35	Fault zone continues to 1908.5' - gouge zones
		152	73	mylonite, breccia w/intense fracturing between.
1900		130	45	
		300	112	
		320	187	Qtz. Monz - med gr. (3-5mm) equigranular moderate to strong
		350	120	qtz - clay sericite alteration, numerous qtz. veins and
		360	175	vugs w/qtz. druse. Pyrite 0.5-3% in finely dissem. grains
		929	112	and veinlets. Sparse chalcopyrite and molybderite in fract-

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SULPHIDE

140' 0.2% Cu

Depth	Cu	Pb	Zn	Description
	.10%		83	
	.09%		83	
	.38%		65	Qtz. Monz. similar to above, more intense qtz. sericite
	.07%		30	alteration, frequent qtz. veins w/vugs and druse. Strong
	.23%		33	fracturing, local cataclastic breccia texture w/interstitial
	.14%		Tr.	mylonite; pyrite 2 - 4% as dissem. grains, veinlets and
	.17%		117	w/qtz. in vugs. Chalcopyrite common in fractures and as
2100	.17%		83	blebs at fracture intersections, also in qtz. veins.
	.14%		117	Molybdenite smears on fractures and as dissem. flakes,
	.18%		184	also as fine blue dust in qtz. veins.
	.19%		234	
	.23%		150	
	.11%		65	
	.16%		234	
	.37%		65	
	.37%		100	
	.12%		83	
2200	.02%		100	
	Tr.		117	Qtz. Monz.- less intense qtz - sericite alteration w/some
	.04%		234	intervals of argillized feldspars, qtz.- sericite stock -
	.05%		167	work veining. Moderate fracturing. Frequent qtz.- sericite -
	.05%		33	pyrite veins w/open vugs lined w/qtz. druse.
	.03%		50	Pyrite 3-4% as disseminated grains, blebs and veinlets.
			50	Rare chalcopyrite grains and blebs.
	.02%		100	Frequent molybdenite in thin veinlets and dust-like grains
	.02%		50	in qtz. veins.
	.03%		167	2258' - 2274' - Strongly sheared - cataclastic texture
	.02%		33	
2300	.02%		50	
	.06%		33	
	.07%		65	
	.07%		50	
	.02%		150	Fractures 50 per foot
	.03%		50	
	.02%		50	
	.02%		50	
	.09%		Tr.	Chalcopyrite - pyrite vein 2 - 3mm at 2388.5'
2400	.11%		Tr.	
	.07%		83	Qtz. Monz.- similar to above - argillic alteration of
	.03%		65	feldspars, frequent qtz.- sericite stockwork veins -
	.09%		65	Pyrite 3-4%.
	.03%		Tr.	
	.05%		33	
	.03%		33	
	.02%		Tr.	
	.02%		Tr.	
	.03%		33	Qtz. Monz. similar to 2180' - 2399'.
	.02%		6	Moderate to strong qtz.- sericite alteration,
2500	481 ppm		178	texture nearly obliterated. Frequent qtz.- pyrite veins
	411		52	w/open vugs and qtz. druse.
	479		137	Pyrite 2-4%, about evenly divided between veinlets and
	505		77	disseminated grains
	204		43	
	546		32	Rare chalcopyrite flecks assoc. w/sericite in fractures.
	245		15	Sparse molybdenite assoc. w/qtz. veins
	609		38	
	578		10	
	283		33	
2600	385		55	
	0.11%		110	Qtz. Monz. similar to 2423'-2610', with strong shearing
	425		217	and cataclastic texture, dark mylonite gouge surrounds
	570		172	fragments of altered rock.
	559	.4% Pb	207	
	300		249	Pyrite 2-4% as above
	315		120	
	554		153	
	188		334	
	112		110	
2700	526		28	
	730		45	
	0.10%		73	Qtz. Monz. similar to above, but less intensely fractured,
	584		215	increased qtz., decreased sericite.
	247		126	
	741		50	Pyrite 2-4% evenly divided between veins and dissem. grains.
	0.13%		120	Slight increase in chalcopyrite on fractures. Rare molybdenite
	773		157	
	0.12%		162	
	642		157	
2800	0.10%		162	
	541		363	
	808		257	
	126		444	
	420		453	
	226		277	
	0.20%		200	Chalcopyrite blebs 2854' - 2868' assoc. w/qtz. pyrite veins.
	0.16%		234	
	76		230	
	65		83	
2900	34		328	
	100		294	
	55		176	
	76		223	
	73		145	
	77		218	
	75		324	Pyrite decreases to 2-3 vol %
	670		89	sparse chalcopyrite flakes on fractures
	395		290	Molybdenite in fractures of tiny veinlets
	990		86	
3000	940		103	Rhodochrosite & calcite veinlets at 3016'
	930		167	
	990		118	
	0.10%		69	Pyrite increases to 5-6%, some large veins &
	608		309	irreg. masses. Rare chalcopyrite;
	155		203	frequent molybdenite in fractures & veinlets
	34		152	
	37			

	155	309	irreg. masses. Rare chalcopyrite;
	34	209	frequent molybdenite in fractures & veinlets
	37	152	
	61	142	
	60	187	Qtz monzonite, similar to 2423-3088'
3100	463	148	pervasive silification
	720	262	pyrite 2.5-3 vol %, rare chalcopyrite
	331	205	moly in veinlets & along fractures
	608	157	
	408	287	
	397	43	
	361	90	
	144	167	
	353	394	Pyrite 2.5 vol %
	744	133	
3200	113	153	
	58	359	
	249	120	
	98	190	
	250	203	
	800	128	
	59	100	
	629	253	Pyrite increases to 3 vol. %
	328	477	
	0.87%	157	Chalcopyrite increases to 1.5% assoc. w/2mm
	0.13%	157	
3300		182	pyrite veins
	0.15% 208	65	
	114	137	
	712	85	
	122	55	
	88	157	
	340	358	
	810	48	Qtz monzonite, moderate to strong
	0.11%	172	qtz-sericite alteration texture
	470	205	subdued to indistinct, depending
3400	242	404	on silicification.
	598	176	
	377	77	Pyrite 4-6 vol %, 40-60% as veins,
	624	132	sparse chalcopyrite blebs, molybdenite
	169	138	as clusters of flakes & veinlets
	0.18%	305	
	614	257	Frequent rhodochrosite veinlets
	566	334	
	143	82	
	110	138	
3500	774	110	Qtz monzonite similar to above,
	596	172	pyrite decreased to 3-4%, rare chalcopyrite,
	62	248	sparse molybdenite.
	24	182	
	319	215	Chalcopyrite, sphalerite & galena in blebs assoc.
	470	187	w/white qtz-feldspar vein at 3532'
	399	315	
	575	55	frequent rhodochrosite veinlets, some
	420	78	hematite w/calcite in fractures
	379	57	
3600	850	45	
	375	52	Qtz monzonite texture more distinct, mottled, poss. qtz- K-spar
	293	68	pyrite 3-4 vol. %, sparse chalcopyrite & molybdenite,
	0.13%	17	chalcopyrite increases 3620-3660'
	0.19%	67	
	0.16%	157	Rhodochrosite in thin 0.5mm irreg. veins
	548	28	
	686	38	
	444	45	
	372	223	
3700	354	107	
	708	155	Qtz. monzonite ?, finer grained than above 1-3mm,
	62	128	mottled gray-white qtz-sericite, appears silicified.
	603	23	Calcite in some fractures in irregular pods.
	115	45	Sparse rhodochrosite veinlets.
	32	33	Pyrite 5-8 vol. % as finely dissem. grains
	51	52	decreasing to 4-5 vol. % at 3706'.
	47	88	Rare chalcopyrite; moly in traces on
	77	182	fractures.
	103	62	
3800	110	38	
	48	55	
	62	57	
	31	40	
	36	52	
	47	173	Increased qtz.; pyrite 6 vol. %
	49	38	rare chalcopyrite & molybdenite
	338	68	
	187	48	Qtz monzonite, mottled appearance from
	412	67	silification, qtz 20-50%, pyrite 3-4 vol %,
3900	30	48	rare chalcopyrite; molybdenite sparse
	177	88	in disseminated flakes & hairline veinlets
	70	187	
	30	305	
	203	40	
	128	105	
	35	123	
	38	123	
	21	98	
	82	100	
4000	143	228	4007' veinlet w/pyrite, sphalerite, galena assoc. w/
	92	57	pink mineral poss. rhodonite & k-spar
	83	40	
	268	78	Qtz monz., similar to 3883-4000', local patches cream-white
	64	18	feldspar, more distinct texture; local qtz flooding,
	T.D. 4042'		pyrite 3-4 vol %, 60% as veinlets. Sparse molybdenite
			in hairline veinlets

AXWL

BEAR CREEK MINING COMPANY

TUCSON, ARIZONA

R.E. Lehner

DATE August 26, 1971

OM R.D. Jones

This document forwarded to: Mr. KES
From: BCMC-S.W. District
Tucson, Arizona
on 8/27/71
R. E. LEHNER

IBJECT: DRILLING REPORT FOR AUGUST, 1971
COURTLAND-GLEESON WEST EXAMINATION (06-01-0000)
COCHISE COUNTY, ARIZONA

Drilling

Drill hole CG-32a was re-entered and deepened from its old bottom of 1,050' to the present depth of 2,085'. Delays caused by sticking the rods and a caving fault zone have reduced progress, and if present efforts to hold the caving ground with mud and additives are unsuccessful, it will be necessary to case the hole and reduce it to BX size.

Following is a summary of footage drilled:

DDH	FROM	TO	CORING	CONTRACTOR	REMARKS
CG-32a	1,050'	2,085'	1,035'	Joy	In progress

Geologic Description CG-32a

Latite porphyry continues to 1,095', followed by medium-fine-grained monzonite from 1,095' to 1,143.5'. Latite porphyry continues to 1,263'. The monzonite is bounded by faults, but may be a phaneritic equivalent of the latite porphyry. Medium-grained, cataclastic-textured quartz monzonite with porpyllitic alteration and sparse pyrite occurs between 1,263' and 1,316'. From 1,316' to 1,384', the hole intersected an intensely-fractured, cryptocrystalline rock tentatively classified as quartzite, but which may be a dike. Contacts are faulted. Quartz monzonite with propyllitic alteration, sparse pyrite, and considerable magnetite continues to 1,592'. Between 1,592' and 1,644', a dike of quartz latite porphyry was intersected. Quartz monzonite with propyllitic alteration and sparse pyrite mineralization continues to a major fault zone of gouge and breccia which begins at 1,812' and extends to 1,845'. At about 1,816', within the fault zone, the alteration of the quartz monzonite changes to quartz-clay-sericite, with 1-3% pyrite, which continues to 2,046.8'. Mineralized felsite and felsite porphyry dikes with 1-2% pyrite alternate with short intervals of quartz monzonite between 2,046.8' and 2,076.5', and the present bottom is in a similar felsite dike.

Assay Results - CG-32a

Assays are available to 2,030'. Copper values are generally low, around 25 ppm, above the fault zone at 1,812 - 1,845'. Below the fault, copper values rise to average above 300 ppm, reflecting the change in intensity of

alteration and the increased pyrite. Molybdenum values remain fairly steady throughout, but are above normal background.

An assay log of CG-32a is appended.

Assay Results - CG-34

Copper assays over the interval 2,610' - 2,875' vary erratically, but average 678 ppm. A 20 foot interval between 2,850' and 2,870' averages 0.18%, higher than visually estimated when the hole was stopped.

Molybdenum assays between 2,610' and 2,875' average 192 ppm MoS_2.

An assay log of CG-34 is appended.

Geophysics

The Geophysics Division laid out an east-west line centered near the Pemberthy shaft to test the possible occurrence of sulfide mineralization beneath Gleeson Ridge. A north-south line has also been laid out west of the ridge. No results have been received as yet from this work due to equipment breakdowns.

Land

An option agreement has been submitted to the owners of the Shannon Mining Company patented claims and approval is expected. Tentative agreement has also been reached with the Cowan family on optioning their patented ground near Gleeson. The Costello family has indicated that they are not interested in Bear Creek's proposition.

Location drilling has been completed on the five Janey claims staked April 29, 1971, and the affidavits of work have been recorded.

Future Plans

It is planned to bring in a second drill rig to test the area south of DDH JL-4 as soon as land control has been established over the southeast part of the VLF anomaly.

Funds Expended

A total of $122,953.28 has been expended to date.

R. D. Jones

RDJ:bjm

encl. as noted

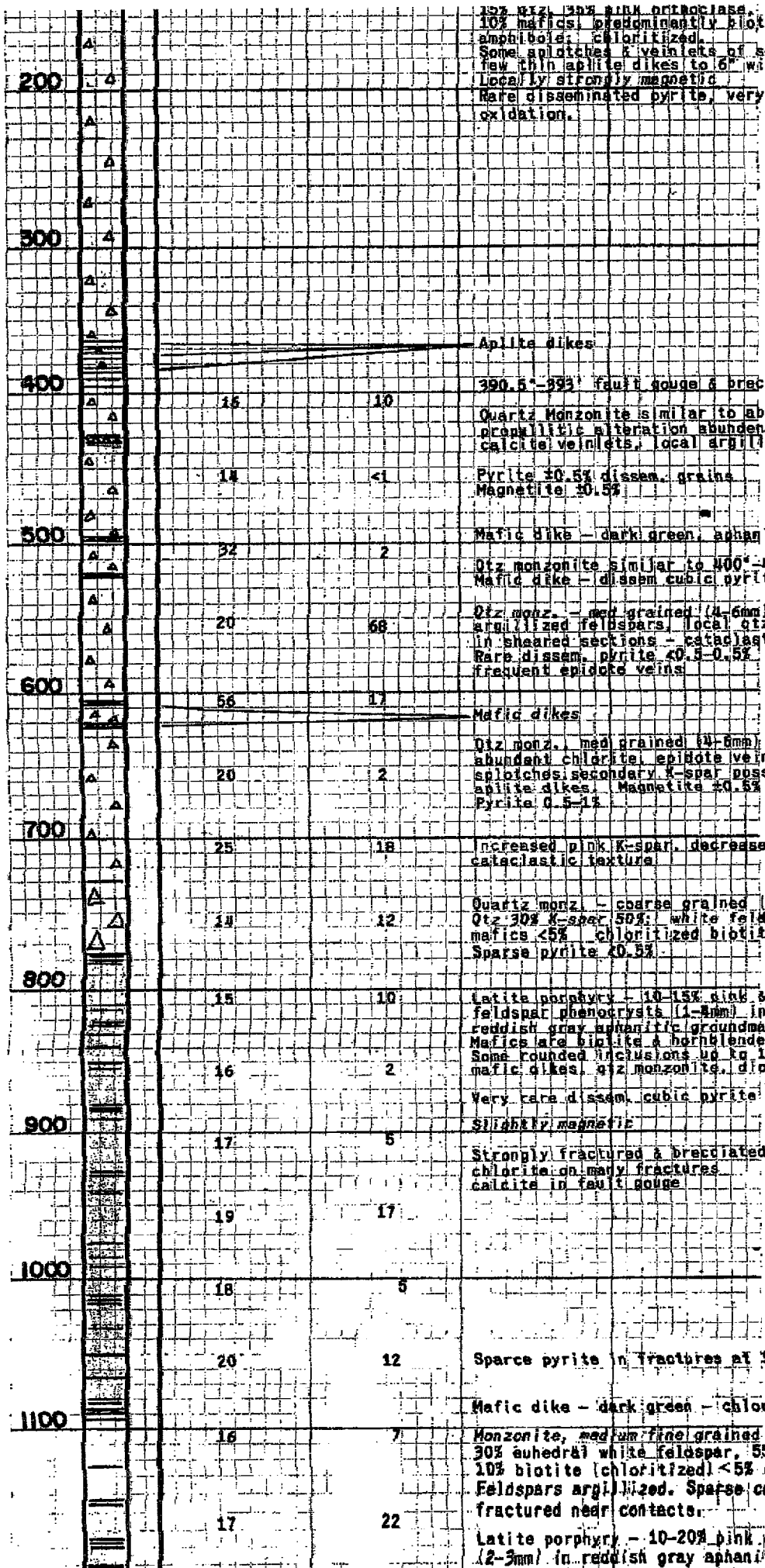
COURTLAND GL SON WEST EXAMINATION
COCHISE COUNTY, ARIZONA
08 - 03 - 0000

HOLE NO CG-32a

COLLAR ELEV. ±5110'

DEPTH	GEOLOGY	Copper (PPM)	MoS_2 (PPM)	
0				Overburden
100				
				Gleeson Qtz Monz.-medium grained (4-6mm) equigranular 15% qtz, 35% pink orthoclase, 30% plagioclase 10% mafics, predominantly biotite, poss. some amphibole; chloritized. Some splotches & veinlets of secondary K-spar few thin aplite dikes to 6" wide Locally strongly magnetic Rare disseminated pyrite, very little oxidation.
200				
300				
				Aplite dikes
400				390.5'-393' fault gouge & breccia
		16	10	Quartz Monzonite similar to above w/increased propylitic alteration abundent chlorite & epidote, calcite veinlets, local argillation of feldspars
		14	<1	Pyrite ±0.5% dissem. grains Magnetite ±0.5%
500				Mafic dike — dark green, aphanitic, w/epidote
		32	2	Qtz monzonite similar to 400'-496.9' - cataclastic texture Mafic dike - dissem cubic pyrite 1-1.5%
		20	68	Qtz monz. - med grained (4-6mm) equigranular argillized feldspars, local qtz-sericite veining in sheared sections - cataclastic texture Rare dissem. pyrite <0.5-0.5% frequent epidote veins
600				
		56	17	Mafic dikes
		20	2	Qtz monz., med grained (4-6mm) abundent chlorite, epidote veinlets splotches secondary K-spar poss. from aplite dikes. Magnetite ±0.5% Pyrite 0.5-1%
700				
		25	18	Increased pink K-spar, decreased magnetite cataclastic texture
		14	12	Quartz monz. - coarse grained (8-10mm) facies Qtz 30% K-spar 50%; white feldspar 15%; mafics <5% chloritized biotite. Sparse pyrite <0.5%
800				
		15	10	Latite porphyry - 10-15% pink & white feldspar phenocrysts (1-4mm) in reddish gray aphanitic groundmass Mafics are biotite & hornblende Some rounded inclusions up to 1" dia. of mafic dikes, qtz monzonite, diorite.
		16	2	

MXWL


200
300
400
500
600
700
800
900
1000
1100
15% qtz, 35% pink orthoclase, 30% plagioclase
10% mafics, predominantly biotite, poss. some
amphibole; chloritized.
Some splotches & veinlets of secondary K-spar
few thin aplite dikes to 6" wide
Locally strongly magnetic
Rare disseminated pyrite, very little
oxidation.
Aplite dikes
390.5'-393' fault gouge & breccia
16 10
Quartz Monzonite similar to above w/increased
propylitic alteration abundent chlorite & epidote,
calcite veinlets, local argillation of feldspars
14 <1
Pyrite ±0.5% dissem. grains
Magnetite ±0.5%
Mafic dike — dark green, aphanitic, w/epidote
32 2
Qtz monzonite similar to 400'-496.9' - cataclastic texture
Mafic dike — dissem cubic pyrite 1-1.5%
20 68
Qtz monz. — med grained (4-6mm) equigranular
argillized feldspars, local qtz-sericite veining
in sheared sections - cataclastic texture
Rare dissem. pyrite <0.5-0.5%
frequent epidote veins
56 17
Mafic dikes
Qtz monz., med grained (4-8mm)
abundant chlorite, epidote veinlets
20 2
splotches secondary K-spar poss. from
aplite dikes. Magnetite ±0.5%
Pyrite 0.5-1%
25 18
Increased pink K-spar, decreased magnetite
cataclastic texture
Quartz monz. - coarse grained (8-10mm) facies
14 12
Qtz 30% K-spar 50%; white feldspar 15%;
mafics <5% chloritized biotite.
Sparse pyrite <0.5%
15 10
Latite porphyry - 10-15% pink & white
feldspar phenocrysts (1-4mm) in
reddish gray aphanitic groundmass
Mafics are biotite & hornblende
Some rounded inclusions up to 1" dia. of
16 2
mafic dikes, qtz monzonite, diorite.
Very rare dissem. cubic pyrite
Slightly magnetic
17 5
Strongly fractured & brecciated,
chlorite on many fractures
calcite in fault gouge
19 17
18 5
20 12
Sparce pyrite in fractures at 1065'
Mafic dike - dark green - chloritized, strongly sheared.
16 7
Monzonite, medium fine grained (2-3mm) equigranular
30% euhedral white feldspar, 55% anhedral pink feldspar,
10% biotite (chloritized) <5% qtz.
Feldspars argillized. Sparse cubic pyrite intensley
fractured near contacts.
17 22
Latite porphyry - 10-20% pink & white feldspar phenocrysts
(2-3mm) in reddish gray aphanitic ground mass. Acessory

	15	10	Latite porphyry - 10-20% pink & white feldspar phenocrysts (1-4mm) in reddish gray aphanitic groundmass Mafics are biotite & hornblende Some rounded inclusions up to 1" dia. of mafic dikes, qtz monzonite, diorite.
	16	2	Very rare dissem. cubic pyrite
900			Slightly magnetic
	17	5	Strongly fractured & brecciated. chlorite on many fractures calcite in fault gouge
	19	17	
1000			
	18	5	
	20	12	Sparce pyrite in fractures at 1065'
1100			Mafic dike - dark green - chloritized, strongly sheared.
	16	7	Monzonite, medium fine grained (2-3mm) equigranular 30% euhedral white feldspar, 55% anhedral pink feldspar, 10% biotite (chloritized) <5% qtz. Feldspars argillized. Sparse cubic pyrite intensley fractured near contacts.
	17	22	Latite porphyry - 10-20% pink & white feldspar phenocrysts (2-3mm) in reddish gray aphanitic ground mass. Acessory biotite phenocrysts. Rare dissem. pyrite
1200			
	21	7	1176.4-1177.5' - intensive breccia or inclusion - aplite - latite porphyry matrix w/rounded diorite frags.
			1229.6'-1230.5' - inclusion or fault sliver course grained qtz. monz. strongly sheared - cataclastic texture.
	15	2	Fault zone
1300			Qtz. Monzonite - med. grained (4-6mm) equigranular propyllitic alterations, sparce pyrite <0.5-0.5% sparse magnatite - intensley fractured - cataclastic texture.
	29	10	Quartzite ? light tan colored crypto crystalline, hard, brittle. No visible grains or bedding. Qtz. dense in some fractures
	29	2	Intensely fractured - close spaced 2-4mm
			Very rare dissem. pyrite
1400			
	22	10	Qtz Monzonite - med. grained (4-6mm) equigranular Qtz. 10-12%, pink feldspar 30%, white feldspar 45%, biotite 10%, horn blende 5%. Feldspars moderately argillized. Epidote abundant in veins & splotches.
	34	23	Chlorite abundant on fractures & after mafics. Pyrite 0.5-1% in dissem. grains along fractures & rare veinlets. Strongly magnetic - may include some pyrrhotite. Magnetite 0.5%.
1500			
	79	23	Pyrite increases 0.5-1.5%
	264	23	1520 - chalcopyrite in small specks in fractures and in blebs assoc. w/qtz. vein.
	58	32	
	54	<1	
	59	10	
1600			
	27	5	Qtz. Latite Porphyry - round qtz. "eyes", 2-3mm euhedral pink & white feldspar phenocrysts, & chloritized biotite in gray - tan aphanitic matrix. Strongly fractured - sparce dissem. pyrite <0.5%.
	20	15	2' inclusion of laminated rock - posibly sheared chilled contact.
1700			Qtz. Monzonite - med. grained (4-6mm) equigranular propyllitic alteration - abundant chlorite & epidote, frequent calcite veinlets- Possible secondary orthoclase in pink irregular masses up to 3cm. Sphene 0.5% in cream yellow wedges. Feldspar slightly altered to clay-serigite, very sparce pyrite, mainly in fractures. Magnetite 0.5%.
	39	28	
	23	7	
1800	26	48	Intensely fractured adjacent to faults.
			Major fault zone - gouge & breccia change in alteration at about 1816'
	430	1	

			10% biotite (chloritized) 10% qtz. Feldspars argillized. Sparse cubic pyrite intensley fractured near contacts.
	17	22	Latite porphyry - 10-20% pink & white feldspar phenocrysts (2-3mm) in reddish gray aphanitic ground mass. Acessory biotite phenocrysts. Rare dissem. pyrite
1200			
	21	7	1176.4-1177.5' - Intensive breccia or inclusion - aplite - latite porphyry matrix w/rounded diorite frags.
			1229.6'-1230.5' - inclusion or fault sliver course grained qtz. monz. strongly sheared - cataclastic texture.
	15	2	Fault zone
1300			Qtz. Monzonite - med. grained (4-6mm) equigranular propyllitic alteration, sparce pyrite <0.5-0.5% sparse magnatite - intensley fractured - cataclastic texture.
	29	10	Quartzite ? light tan colored crypto crystalline, hard, brittle. No visible grains or bedding. Qtz. dense in some fractures
	29	2	Intensely fractured - close spaced 2-4mm
			Very rare dissem. pyrite
1400			
	22	10	Qtz Monzonite - med. grained (4-6mm) equigranular Qtz. 10-12%, pink feldspar 30%, white feldspar 45%, biotite 10%, horn blende 5%. Feldspars moderately argillized. Epidote abundant in veins & sploches.
	34	23	Chlorite abundant on fractures & after mafics. Pyrite 0.5-1% in dissem. grains along fractures & rare veinlets. Strongly magnetic - may include some pyrrhotite. Magnetite 0.5%.
1500			
	79	23	Pyrite increases 0.5-1.5%
	264	23	1520 - chalcopyrite in small specks in fractures and in blebs assoc. w/qtz. vein.
	58	32	
	54	<1	
	59	18	
1600			
	27	5	Qtz. Latite Porphyry - round qtz. "eyes", 2-3mm euhedral pink & white feldspar phenocrysts, & chloritized biotite in gray - tan aphanitic matrix. Strongly fractured - sparce dissem. pyrite <0.5%.
	20	15	2' inclusion of laminated rock - possibly sheared chilled contact.
1700			Qtz. Monzonite - med. grained (4-6mm) equigranular propyllitic alteration - abundant chlorite & epidote, frequent calcite veinlets-
	39	28	Possible secondary orthoclase in pink irregular masses up to 3cm. Sphene 0.5% in cream yellow wedges. Feldspar slightly altered to clay-sericite, very sparce pyrite, mainly in fractures. Magnetite 0.5%.
	23	7	
1800			
	26	48	Intensely fractured adjacent to faults.
			Major fault zone - gouge & breccia change in alteration at about 1816'
	430	1	
	420	2	
	412	12	
	500	23	Qtz. Monzonite - med. grained (4-6mm) equigranular. - Qtz. 20 - 25%, feldspar 70%, mafics (chlorite) <5%
	309	10	
1900	298	33	Moderate qtz. - clay sericite alteration intensely fractured
	215	10	
	480	5	
	260	1	
	365	10	
	311	10	Qtz. Monzonite - similar to 1845' - 1936.5', argillic alteration increased chlorite. Pyrite 1-3% in dissem. grains and veinlets. Local magnetite <0.5% assoc. w/chlorite.
	450	12	
	641	18	
		10	
		17	2' strong qtz. sericite alteration 1986' - 1988' w/blebs chalcopyrite
2000		18	
		5	Increase in qtz. - sericite veining, pyrite 1-2%, approx. half in veinlets.
		12	
		2	
			Felsite dikes faint porphyritic texture; 1-2% finely dissem. pyrite, strong fracturing +50/ft.
	2085' 8/24/71		Qtz Monzonite - argillic alteration, 1-2% pyrite - similar to 1988-204 Felsite porphyry dike, similar to 2046.8-2052.4'
2100			

PROJECT LOURTLAND GLEESON HOLE NO. 53-1 COLLAR ELEV. 5080.6 BEARING ____ ANGLE 70 COORDS. N. ____ E. ____ SCALE: 1"=100' PAGE 1

STARTED 9/15/75 COMPLETED 12/8/75 TOTAL DEPTH 3150 LOCATION 800' North & 250' West of the SE corner section 29 LOGGED BY: M.B. Lee

St. Joe Minerals Corp.

VENTURE Drilling Co. 6½" HAMMER

CORE SIZE	% RECOV.	GRAPHIC GEOLOGY	Quartz	Chlorite	Calcite	Epidote	Clay	Sericite	Kaolin	CLASS.	Magnetite	Hematite	Pyrite	Cu	VOL. % SULFIDES	STRUCTURE	VEINS	THIN SECTION	GEOLOGIC DESCRIPTION
																			0-40' = Propylitic altered medium-grained Gleeson Quartz Monzonite biotite → chlorite + magnetite, plag. weakly altered to clay
				15%		5%					10%				<1%		2-4-7, 47-8		
				10%															
						2%						2%					1, 2-4		40'-50' = hornblende-bearing Gleeson Quartz Monzonite, less chlorite & less veinlets than 0-40' interval
		JTRg		5%							4%				1%		1-4-(10), 2-4		50'-330' = Propylitic altered Gleeson Qtz Monzonite, 1/8" veinlets of qtz w/ pyrite, epidote & chlorite
															<1	ΔΔ	2-4-8, 9-(5)		hematite replacing magnetite on fractures, minor brecciation; minor clay associated w/ hematite
												5%			2		3, 2-4-10, 4-7		
				10%		5%				PROPYLITIC	10%					ΔΔ	(1-5-9), 2, 2-4		increasing hematite & brecciation
												2%			1		1, 2-4		fissure filling coxcomb quartz w/out S+; hornblende-bearing qtz monzonite
																	1-2-4		
				5%								1%			<1		2-10, 2-4		hornblende-bearing qtz monzonite; some veinlet controlled pyrite
				7%		10%					5%				2		2-10 2-4, 2, 4		minor H_2O @ 120' (now using H_2O injection)
												<1%			1		2-4, 1 10,		increasing chlorite, trace qtz aplite w/ pyrite

COURTL

TERTIARY
- DIORITE, ANDESITE, DIABASE
- QUARTZ LATITE (SUGARLOAF TYPE)

COPPER BELL FAMILY
- GRANITE, QUARTZ ORB MONZONITE, RHYOLITE
- DACITE, QUARTZ EYE DACITE, RHYODACITE
- PORPHYRITIC LATITE, DACI-ANDESITE, MONZONITE
- INTRUSIVE BRECCIA

UNKNOWN AGE
- QUARTZ DIORITE
- QUARTZITE
- FAULT ZONE

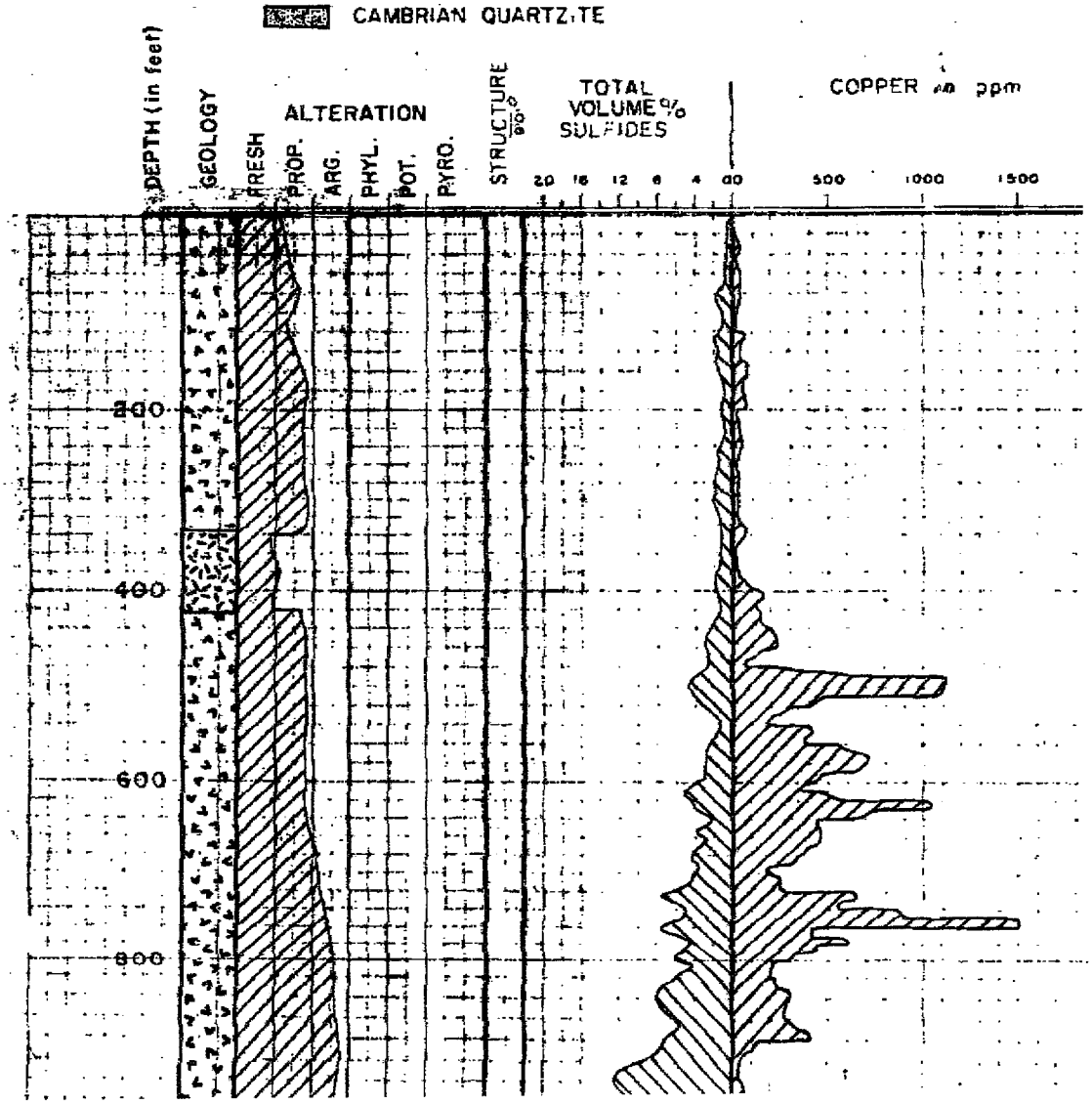
SJ-1

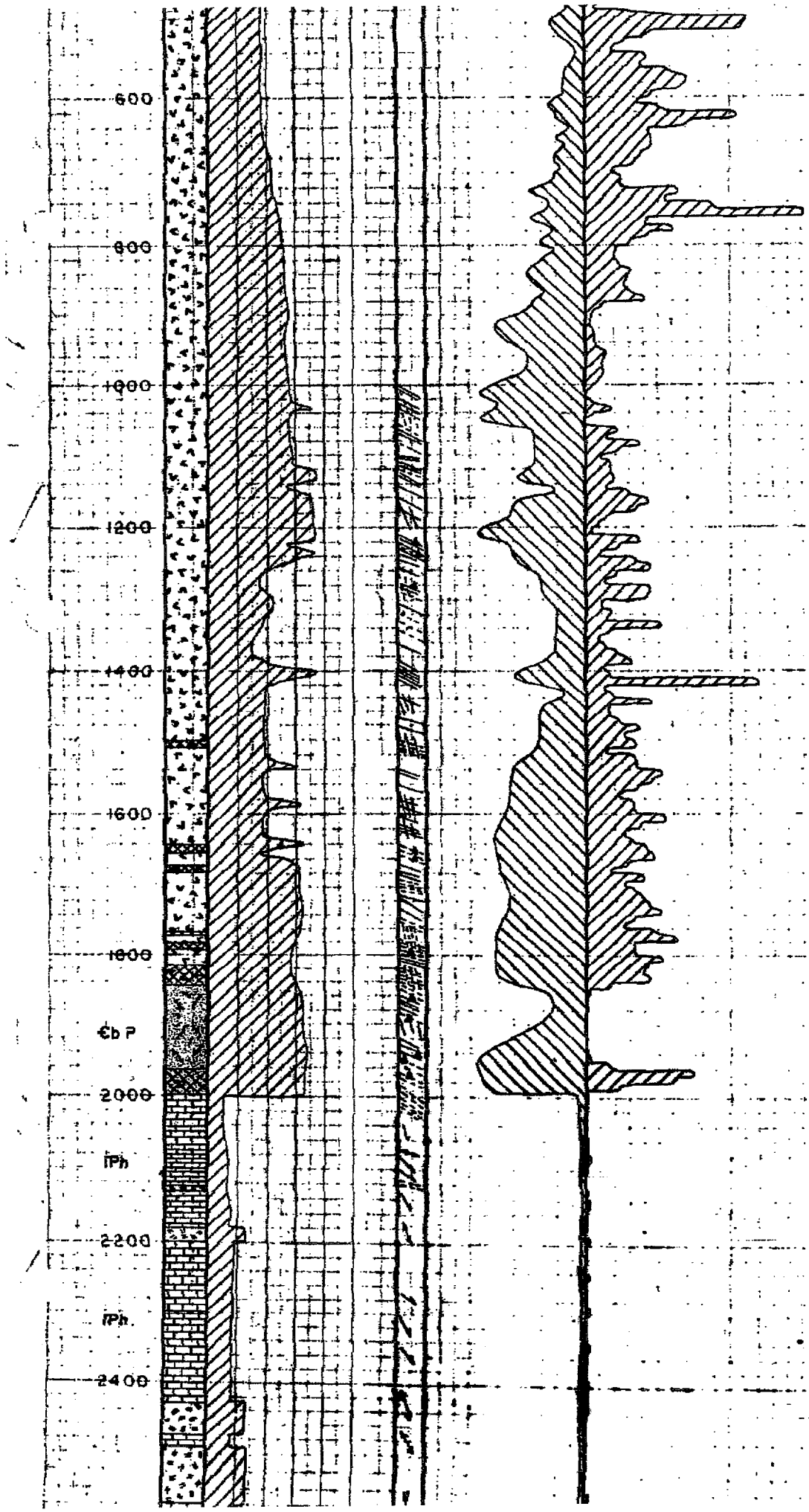
CRETACEOUS PYROCLASTICS & SEDIMENTS
- TUFF, IGNEOUS BRECCIA, AGGLOMERATE
- ARGILLITE, MUDSTONE, CALCAREOUS SHALE, QUARTZITE
- LIMESTONE (& DOLOMITE), CHERT

GLEESON QUARTZ MONZONITE
- QUARTZ MONZONITE PORPHYRY
- COARSE QUARTZ MONZONITE
- QUARTZ MONZONITE

PALEOZOIC ROCKS
- PENNSYLVANIA LIMESTONE
- CAMBRIAN QUARTZITE

PRECAMBRIAN
- PINAL SCHIST

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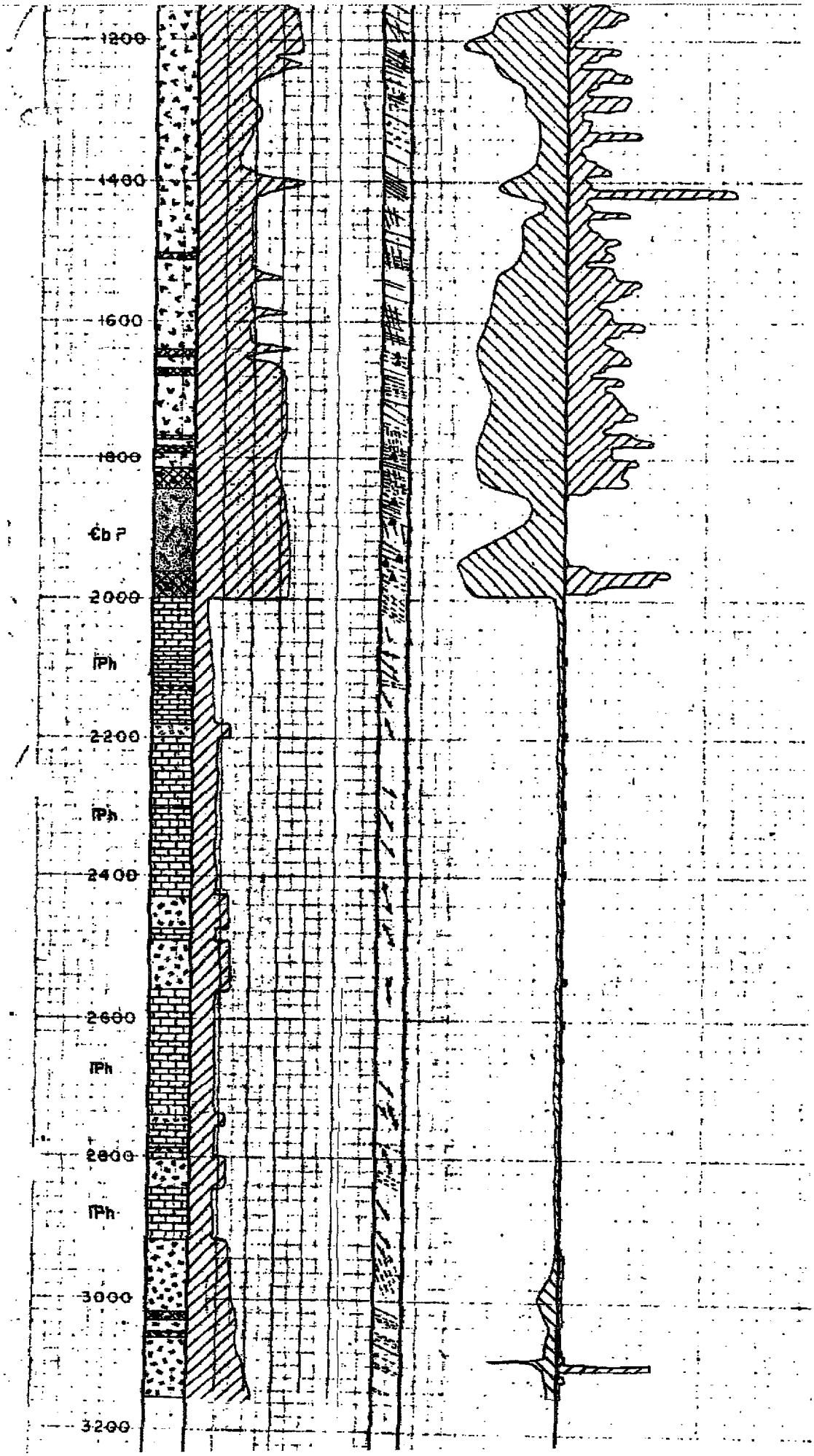
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3200

Bear Creek Mining Company

Tucson Office

September 10, 1973

RECEIVED
Computer Division Operations
SEP 12 1973

Mr. P. M. Wright
Kennecott Exploration, Inc.
2300 West 1700 South
Salt Lake City, Utah 84104

Dear Mike:

Subject: Courtland-Gleeson, Arizona
Quintana's 1973 Drill Holes

A copy of a summary log for each of Quintana's three 1973 holes is enclosed. These may be useful for interpreting V.I.P. results for the western end lines run in 1972. I understand that clearer summary logs are soon to be drafted by Quintana, but the enclosed ones may be helpful to you in the interim.

Sincerely,

G. F. Lister

GFL:ct
Encls.
CV-1 Summary
CV-2 Summary
CV-3 Summary
Drill Hole Location Sketch

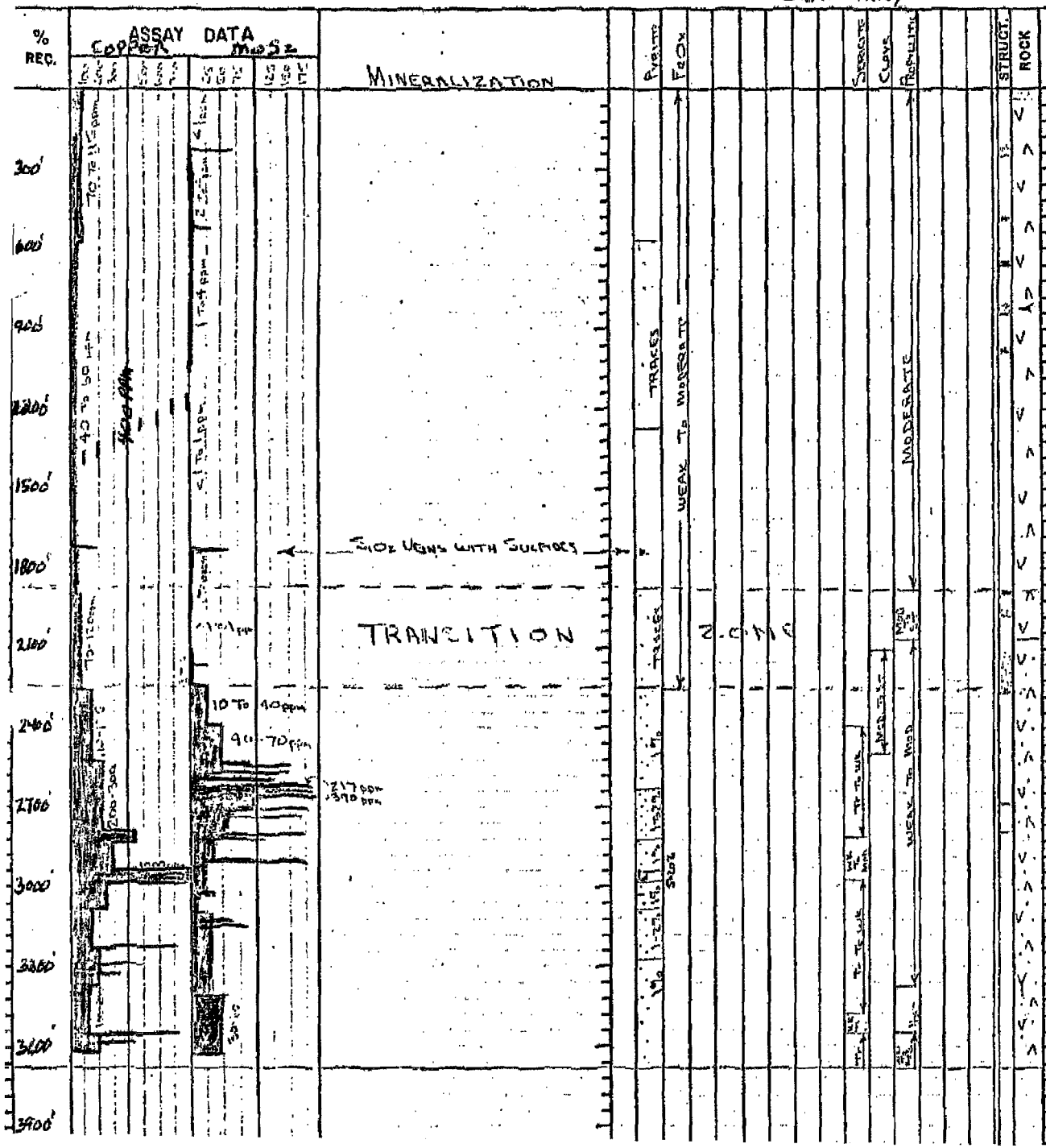
R ELEVATION
DEPTH 3674'
ATION 90° BEARING LOCATION

QUINTANA MINERALS CORP.
DIAMOND DRILL HOLE RECORD

CV-1

Summary.

PAGE NO. 1 of 1
DESCRIBED BY Jay Cooley
SCALE 1" = 600'



GENERAL DESCRIPTION

0-40 Qal

40-2070
PINK COARSE GRAINED FACIES OF GLEESON QUARTZ MONZONITE CUT BY YOUNGER DIKES & VEINS OF DIABASE (?) FELSITES, AND APLITES IN A FEW PLACES

FAULT ZONE

Sec 25, T19S, R24E
400 FNL
1700 FEL
Elev. 5225'

Turquoise 7½' quad.

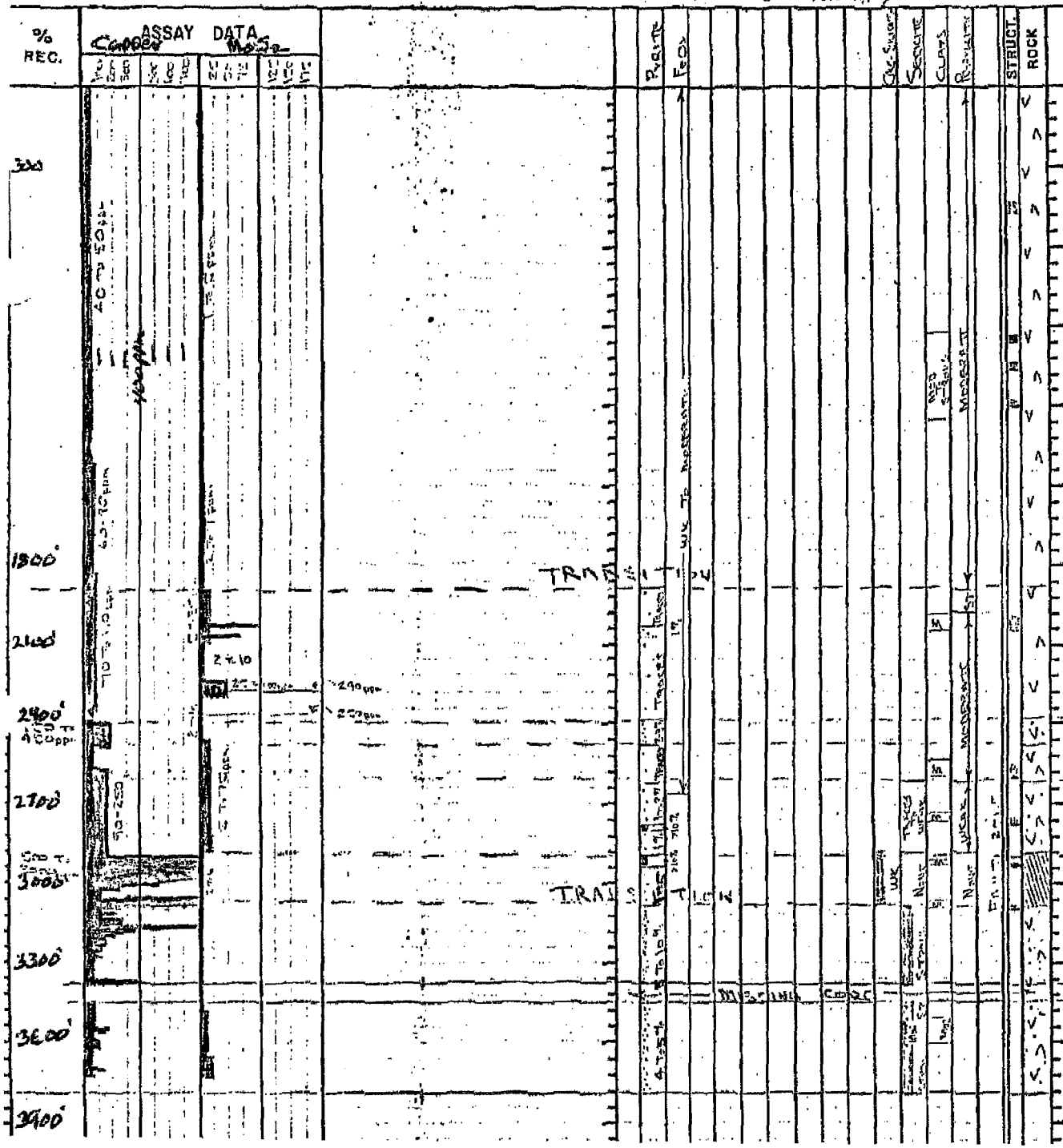
2070 -
GRAY MEDIUM GRAINED FACIES OF GLEESON QUARTZ MONZONITE

T.D. 3674

H ELEVATION _____
DEPTH 3786'
IATION 90° BEARING _____ LOCATION _____

QUINTANA MINERALS CORP. CV-2
DIAMOND DRILL HOLE RECORD

PAGE NO. 1 of 1
DESCRIBED BY Jay Quinn
SCALE 1" = 100'



GENERAL DESCRIPTION

0-10 (Qal)
10-302'
PINK COARSE GRAINED FACIES OF GLEESON QUARTZ MONZONITE. CUT BY YOUNGER DIKES + VEINS OF DIABASE(?), FELSITES AND APLITES IN A FEW PLACES.

420-470 FAULT ZONE

930-960 FAULT ZONE

1032-1061 FAULT ZONE

1182-1200 FAULT ZONE

990-2040' FAULT ZONE

2392-2480
GRAY MEDIUM GRAINED FACIES OF GLEESON Q.M.

2480-2600
PINK COARSE GRAINED FACIES OF GLEESON Q.M.

2600-2886
GRAY MEDIUM GRAINED FACIES OF GLEESON Q.M.

2886-3086
CALCAREOUS SEDIMENTS DIPPING 70° TO 70°

3086 -
INTENSELY ALTERED ROCK CONSISTING OF SERICITE-QUARTZ-PYRITE, WITH A FEW RELICT PATCHES OF ARGILLIZED GLEESON Q.M.(?)

T.D. 3786

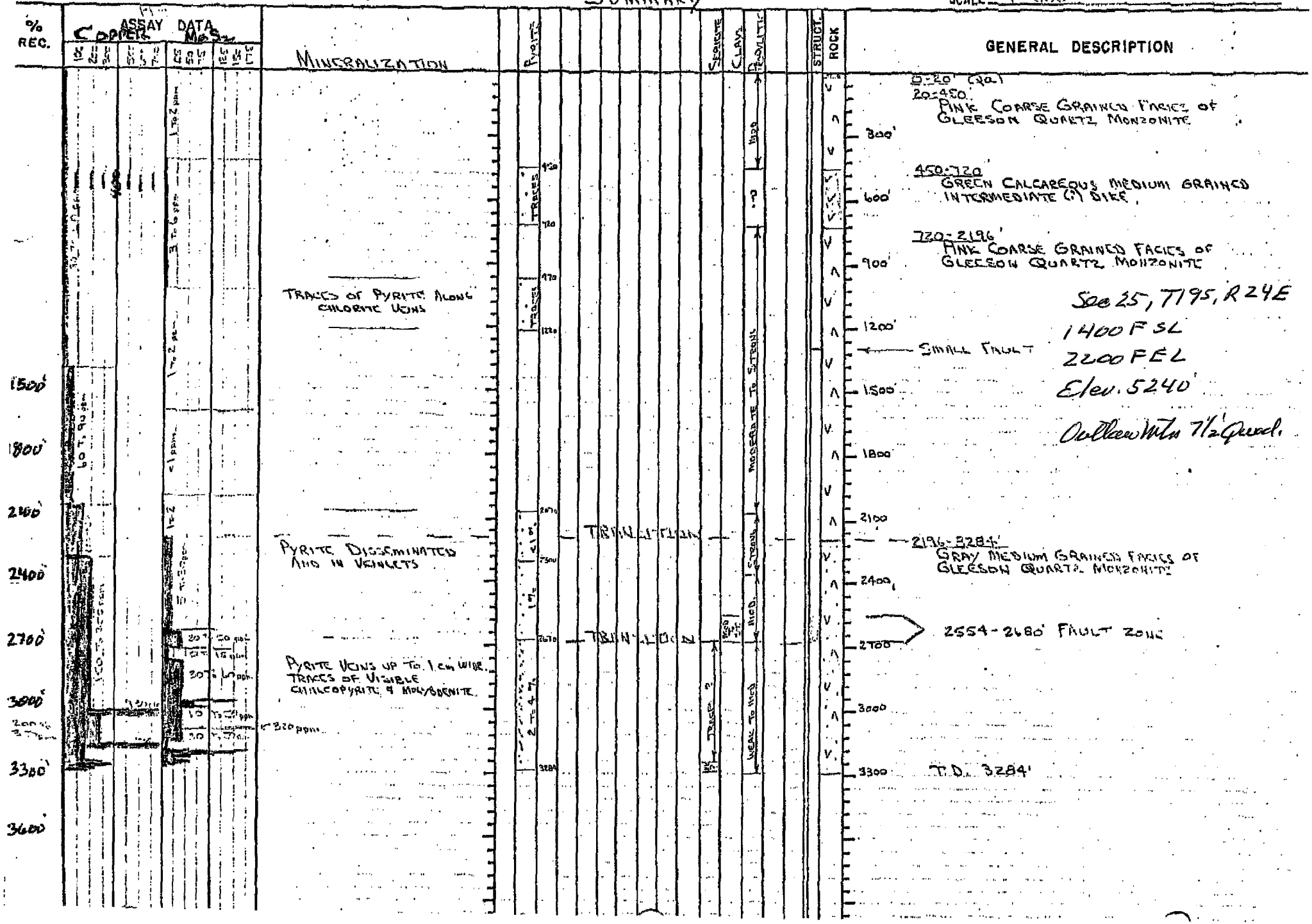
Sec 24, T19S, R24E
2600 FNL
1900 FEL
Elev. 5240'

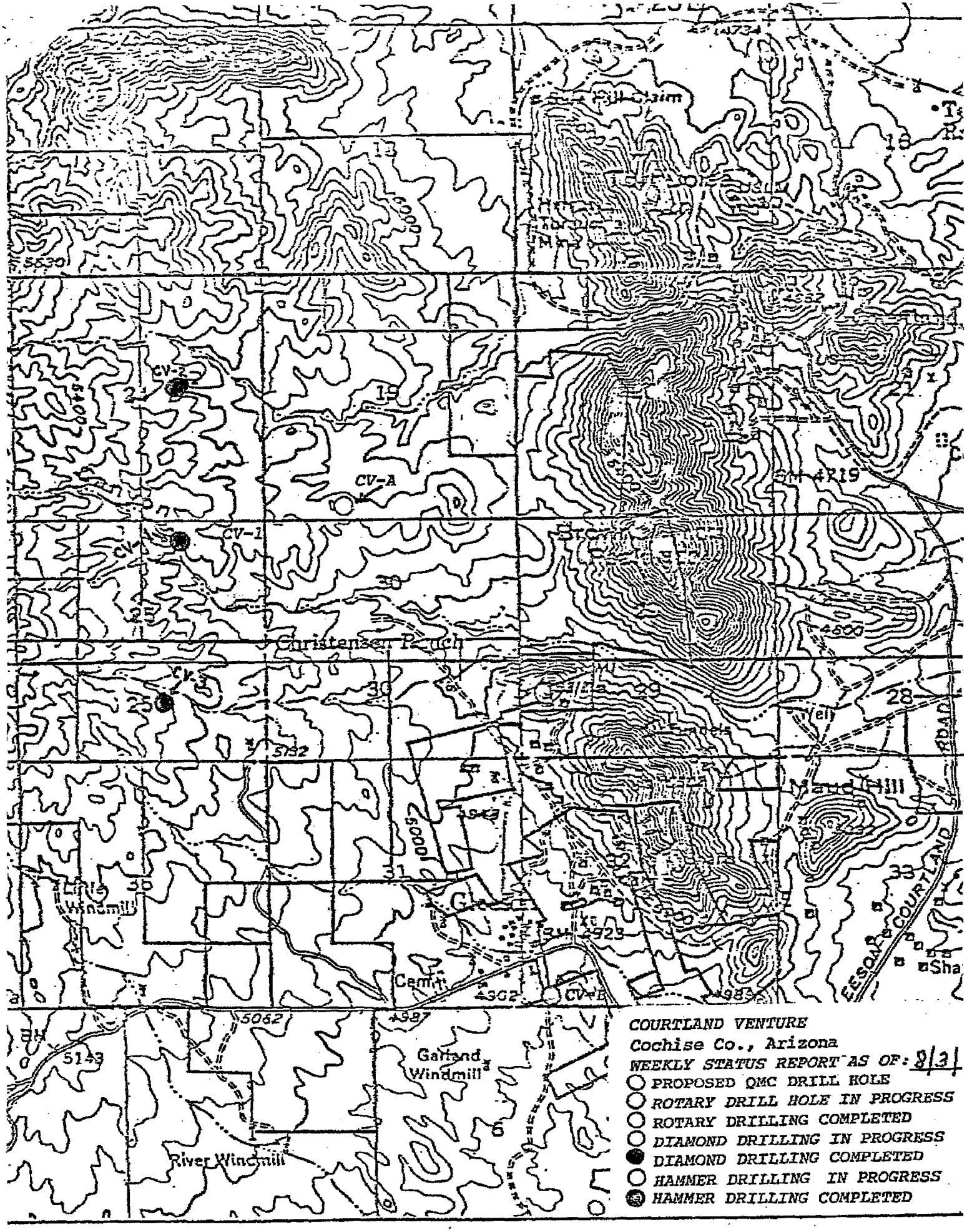
Tangerine
7½' Quad.

ELEVATION [illegible] Approx.
DEPTH 3284'
ITION [illegible] BEARING ____ LOCATION S 25; R24E; T19S

QUINTANA MINERALS CORP. CW-3
DIAMOND DRILL HOLE RECORD
SUMMARY

PAGE NO. 1 of 1
DESCRIBED BY JAY QUICK
SCALE 1" = 600'




COURTLAND VENTURE
Cochise Co., Arizona
WEEKLY STATUS REPORT AS OF: 8/31
PROPOSED QMC DRILL HOLE
ROTARY DRILL HOLE IN PROGRESS
ROTARY DRILLING COMPLETED
DIAMOND DRILLING IN PROGRESS
DIAMOND DRILLING COMPLETED
HAMMER DRILLING IN PROGRESS
HAMMER DRILLING COMPLETED
CV-A
CV-1
CV-2
Christensen Ranch
Little Windmill
Garland Windmill
River Windmill
Cemetery
Sand Hill
COURTLAND
ESSOM

K & K MINING, INC.
P.O. Box 2706
Nogales, Arizona 85628

Courtland Area Drill Hole.

Santa Fe Mineral, 1988 "SF-88"
Turquoise Mtn 7½' Quad.
NW Corner of Sec. 26, T 19S, R 25E.
(may have been in Sec. 27)
South of east-west road (Rucker road).
Just off road, some 2000-8000 feet east of junction
with Gleeson-Courtland (N-S) Road.

0-485 Conglomerate (gravel)
485-610 Tertiary andesite with
magnetite.
include 10' at base of clay with
hot water (andesite & Bisbee bx frags) —
(may be Courtland Thrust which dips
west & last seen in Section 22 to the
northwest of the drill hole).
610-660 T.D. Bisbee Formation.

Hole drilled at north end of magnetic
anomaly that trends on south. They
believed the magnetite in the andesite
was responsible for the readings.
Several other similar anomalies are in
the area.

(data from GW)(2-94)

BEAR CREEK MINING COMPANY
1714 West Grant Road
Tucson, Arizona 85705

M E M O R A N D U M

TO: D. M. Snyder DATE: September 18, 1972

FROM: G. F. Lister

SUBJECT: COURTLAND-GLEESON

Hole CG-37 was completed in June at a depth of 2215 feet in pyroclastics and sediments of the Cretaceous Bisbee group below the Courtland thrust. Recognition that the latitic and dacitic intrusive rocks intersected between 1042 feet and 1750 feet are correlative with the Copper Belle monzonite porphyry provided support for the concept of a post-thrusting intrusion-mineralization event. This concept guided the positioning of hole CG-38.

During July hole JL-4 was deepened from 3281 feet to 3645 feet. The hole intersected strongly altered latite porphyry and rhyodacite, both of which contain disseminated pyrite and minor disseminated chalcopyrite. A 10-foot inclusion of altered, crushed, calcareous shale was encountered near 3500 feet. Thin veinlets of chalcopyrite around 3565 feet and 3605 feet increase the copper content of two ten-foot intervals to 0.71% and 0.80% copper. These intervals are within background that approximates 0.1% copper. Drilling problems forced suspension of the hole at 3645 feet. Further deepening is possible but will require reduction to AX size core.

Hole CG-38 began July 26th and had reached a depth of 3136 feet by September 16th. The hole started in mildly chloritized quartz monzonite that was weakly magnetic due to 0.5% accessory primary magnetite and contained less than 20 ppm copper and 3 ppm molybdenum. No magnetite persisted below a depth of approximately 800 feet. A gradual increase in alteration, sulfide content and content of copper and molybdenum was observed as the hole progressed deeper. Below 1600 feet thin, gently-dipping dikes of dacitic rock are more abundant. A gently-dipping fault zone was crossed at 1900 feet. The fault apparently is parallel to, and related to, the deeper Courtland thrust. Strong quartz-sericite alteration and strong pyrite veining are present beneath the fault. Two thin dacitic dikes between 2,000 and 2,100 feet illustrate the

anomalous copper content of this family of rocks. At 2180 feet the hole entered an alternation of several varieties of intensely altered quartz porphyries and quartz monzonite. The quartz porphyries are gently dipping, tabular bodies of altered dacite to rhyolite that are more siliceous deeper in the hole. In addition the amount of quartz eye intrusive breccia increases with depth. Below 2760 feet the drill hole penetrated a 150-foot interval of rock composed of approximately 90% quartz, probably quartzite, then re-entered the quartz eye dacitic rocks.

Strongly anomalous molybdenum values are general below a depth of approximately 1400 feet. Below 2100 feet the average molybdenum content exceeds 200 ppm and the highest assay is 10 feet of 0.14% Mo. Copper values exceeding 500 ppm are common between 2000 feet and 2180 and three 10-foot intervals exceed 0.1% Cu. At 2461 feet a two-foot dike of quartz eye rhyodacite rock with disseminated chalcopyrite assayed 0.91% Cu. Copper values exceeding 0.1% Cu are common below 2530 feet but these are erratic. The quartz rock appears to be a less favorable host for copper than the dacitic and rhyodacitic rocks.

A different interpretation of the relationship of the quartz eye rocks is possible. These could be regarded as an extremely altered contact phase of the Gleeson quartz monzonite rather than a member of the Copper Belle family.

Below 3027 feet inclusions of altered sedimentary rocks, including some argillite, are present in the quartz porphyry intrusive breccia. At 3085 feet the hole entered a major fault zone interpreted as the gently-dipping Courtland thrust. Rock in the fault zone is crushed and gouged argillite with erratic silicification and minor pyrite mostly as veins.

The results from holes CG-37, JL-4 and CG-38 can be interpreted to support the concept that the sulfide system is genetically related to an intrusive event much younger than the Gleeson quartz monzonite. The intrusive event left a diverse group of intrusives that squeezed into the Courtland thrust and into subsidiary, parallel faults above it. For simplicity, the group of intrusives is referred to as the Copper Belle family. Members of the family range from the well-exposed and long-recognized Copper Belle porphyritic latite (little or no primary quartz) through a varied-textured rock termed quartz orb monzonite, to quartz eye dacites and rhyodacites, to rhyolite. The diversity of rock types within this high-background copper family suggests extreme

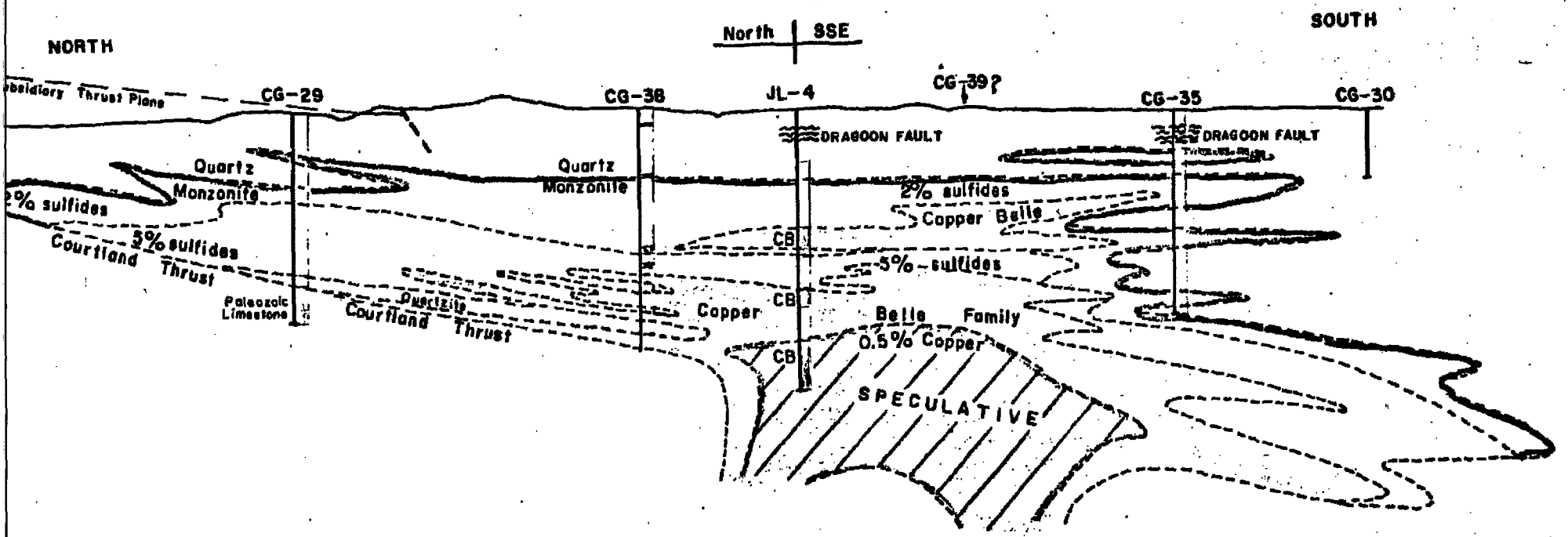
differentiation took place such as would collect copper into a copper-rich liquid that could create a copper deposit within the enormous sulfide system. The amount of post-mineral movement on the Courtland thrust plane is believed to be minor.

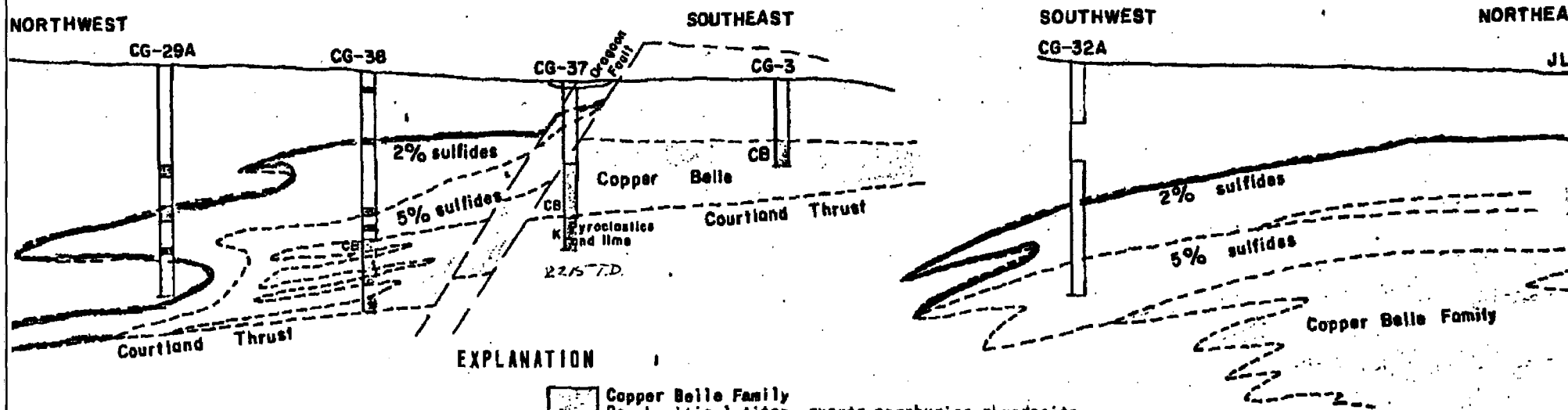
The current target concept is illustrated in the accompanying cross sections. Plans are to begin hole CG-39 south of hole JL-4 during the week of September 18th.

Gordon

G. F. Lister

GFL:ct





EXPLANATION

OUTER LIMITS

- 2% Sulfides
- 5% Sulfides
- 0.5% Copper

- Copper Belle Family Porphyritic latites, quartz porphyries, rhyodacite
- Cretaceous pyroclastics and sediments
- Gleeson quartz monzonite
- Paleozoic limestone
- Precambrian schist

1" = 2000'

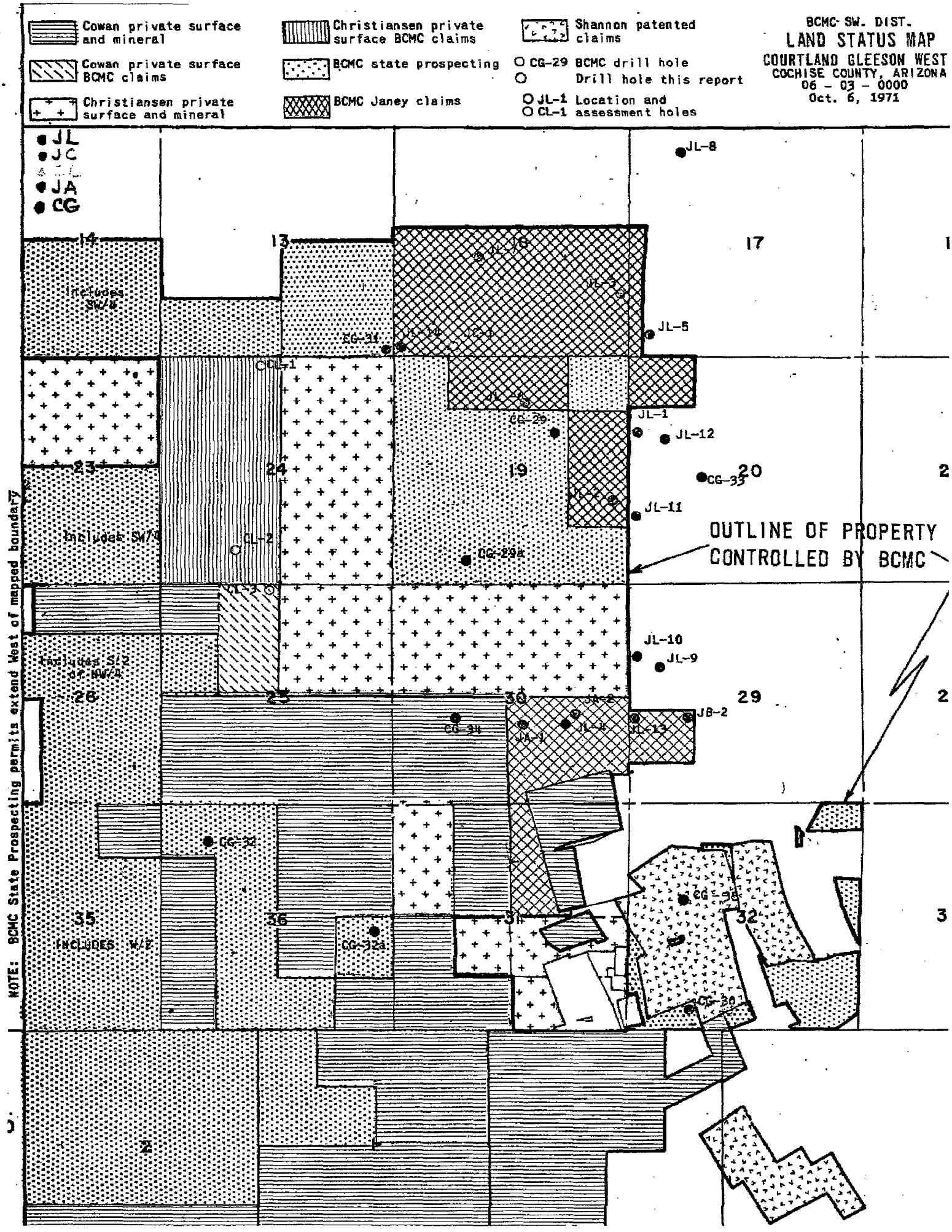
CROSS SECTIONS ILLUSTRATING THE

TARGET CONCEPT

COURTLAND GLEESON EXAMINATION

COCHISE COUNTY, ARIZONA

06 - 03 - 0000


Cowan private surface and mineral
Cowan private surface BCMC claims
Christiansen private surface and mineral
Christiansen private surface BCMC claims
BCMC state prospecting
BCMC Janey claims
Shannon patented claims
CG-29 BCMC drill hole
Drill hole this report
JL-1 Location and
CL-1 assessment holes
BCMC SW. DIST.
LAND STATUS MAP
COURTLAND GLEESON WEST
COCHISE COUNTY, ARIZONA
06 - 03 - 0000
Oct. 6, 1971
JL
JC
JA
CG
OUTLINE OF PROPERTY CONTROLLED BY BCMC
NOTE: BCMC State Prospecting permits extend West of mapped boundary
Includes SW/4
Includes SW/4
Includes S/2 of NW/4
INCLUDES W/2
JL-8
JL-5
JL-1
JL-12
CG-33
JL-11
CG-29a
JL-10
JL-9
JB-2
JL-13
JL-4
JA-1
CG-34
CG-31
CG-29
CG-32
CG-32a
CG-30
CL-1
CL-2
CL-3
13
14
17
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36

BE ? CREEK MINING COM NY
2601 NORTH FIRST AVENUE
TUCSON, ARIZONA

TO R. E. Lehner DATE January 26, 1971

FROM Richard D. Jones

SUBJECT: Drilling Report for January 1971
Courtland-Gleeson-West Examination (06-01-0000), Cochise County, Arizona.

DRILLING

Drill hole JL-4 was completed January 20, 1971 at a depth of 3281 feet. Progress since January 1 was slow because of freeze-up problems, lack of water return, and because the contractor changed drill crews, sending the experienced hands to another job. The following is a summary of footage drilled:

Drill Hole	From	To	Coring	Contractor	Remarks
JL-14	1515	3281	1766	Joy	Completed

GEOLOGIC DESCRIPTION - JL-4

± Center SE 1/4, Sec. 30

From 1515' to 1574', the hole was in monzonite porphyry resembling Copper Belle, with 3-5% pyrite. Weakly sericitized quartz monzonite carrying 2% pyrite was cut from 1574' to 1604'. Monzonite porphyry with 3% pyrite continued from 1604' to 1795.5'. From 1795.5' to 1820', altered quartz monzonite with 5-10% pyrite and increased fracturing was encountered. A sedimentary section, composed of strongly brecciated sericitic quartzite with 4-8% pyrite, distinguished with difficulty from altered monzonite porphyry, was intersected from 1820' to 2460'. Some dikes of intensely altered monzonite are included within the quartzite. From 2460' to 3001', altered serpentine-chlorite-epidote (possibly limy shale originally) alternates with brecciated sericitic quartzite and thin altered monzonite porphryry dikes. Visible chalcopyrite is associated with the lime silicate minerals, but pyrite continues throughout at 4-8%. Monzonite porphyry, with intense quartz-sericite alteration and 4-6% pyrite occurs in the interval 3001' to 3281'. Copper mineralization increases, and locally chalcopyrite occurs as irregular vertical stringers.

The sedimentary rocks encountered in JL-4 are difficult to correlate with other rocks. Contacts with the intrusives are indistinct and much hybridization has occured. The sericitic quartzite could as easily be related to the Cretaceous Bisbee group as to the Cambrian, Bolsa quartzite, and the serpentine-chlorite-epidote rock may represent limy shale from the Cambrian Abrigo formation or from the Bisbee group.

The sedimentary section is brecciated throughout, and numerous slips and gouge zones are encountered, but it would be difficult at this stage to ascribe any of these features to particular faults. The sediments may be a zenolith within the intrusive rocks, or may lie adjacent to the main intrusive mass.

January 26, 1971

ASSAY RESULTS

Copper values in the upper part of DDH JL-4 are low, 26-60 ppm between 300' and 1,000'. Other values in the same interval are molybdenum 3-8 ppm, lead 30-200 ppm, and zinc 55-385 ppm. Copper increases to 455 ppm between 1,000' and 1,150', with other values low. The interval 1,150' to 1,500' averages 80 ppm copper, 13 ppm moly, 36 ppm lead, and 118 ppm zinc.

In the monzonite porphyry between 1,500' and 1,800', copper increases to about 300 ppm, with a rise in molybdenum to 45 ppm.

The contact zone between quartz monzonite and quartzite (1,800' to 1,950') shows a marked increase in copper to above 500 ppm, with one 20 foot interval (1,850-1,870') carrying 0.14% Cu. Other values show slight increases.

The sericitic quartzite between 1,950' and 2,370' carries only 50 ppm copper, 65 ppm moly, 30 ppm lead, and 200 ppm zinc, which drops off below 2,240' to only 15 ppm.

Copper values in the section between 2,390' and 3,000' are variable, reflecting the mixture of rock types in the interval, but are generally high in intrusive contact zones and chlorite-serpentine-epidote bearing rock (Cu = 500-1,000 ppm) and low in the quartzite (Cu = 50 ppm). Other metals are low.

Erratic higher-grade copper mineralization is found in the monzonite porphyry near the bottom of the hole. The ten-foot interval, 3,080'-3,090', ran 1.31% Cu, .009% Mo, 0.15% Pb, and 0.70% Zn. A second ten-foot interval, 3,180'-3,190', ran 2.60% Cu, trace Mo, 0.05% Pb and 0.10% Zn. The two higher-grade intercepts and the interval between them averages approximately 0.4% Cu over 110 feet.

Assays below 3,190 feet are as follows:

3,190' to 3,210'	=	0.36% Copper
3,210' to 3,281'	=	300 ppm Copper

FUTURE PLANS

Assessment drilling on two parcels of land held under State permit must be completed by March 5, 1971 and on a third by March 26. It is planned to deepen drill holes 29a, 30 and 31 to meet this work commitment. The Joy rig is presently moving to 29a, which will be deepened from its present bottom of 610 feet. At the same time, it is planned to re-evaluate previous drilling and structural interpretation in the light of results from JL-4, before recommending additional deep drilling.

FUNDS EXPENDED

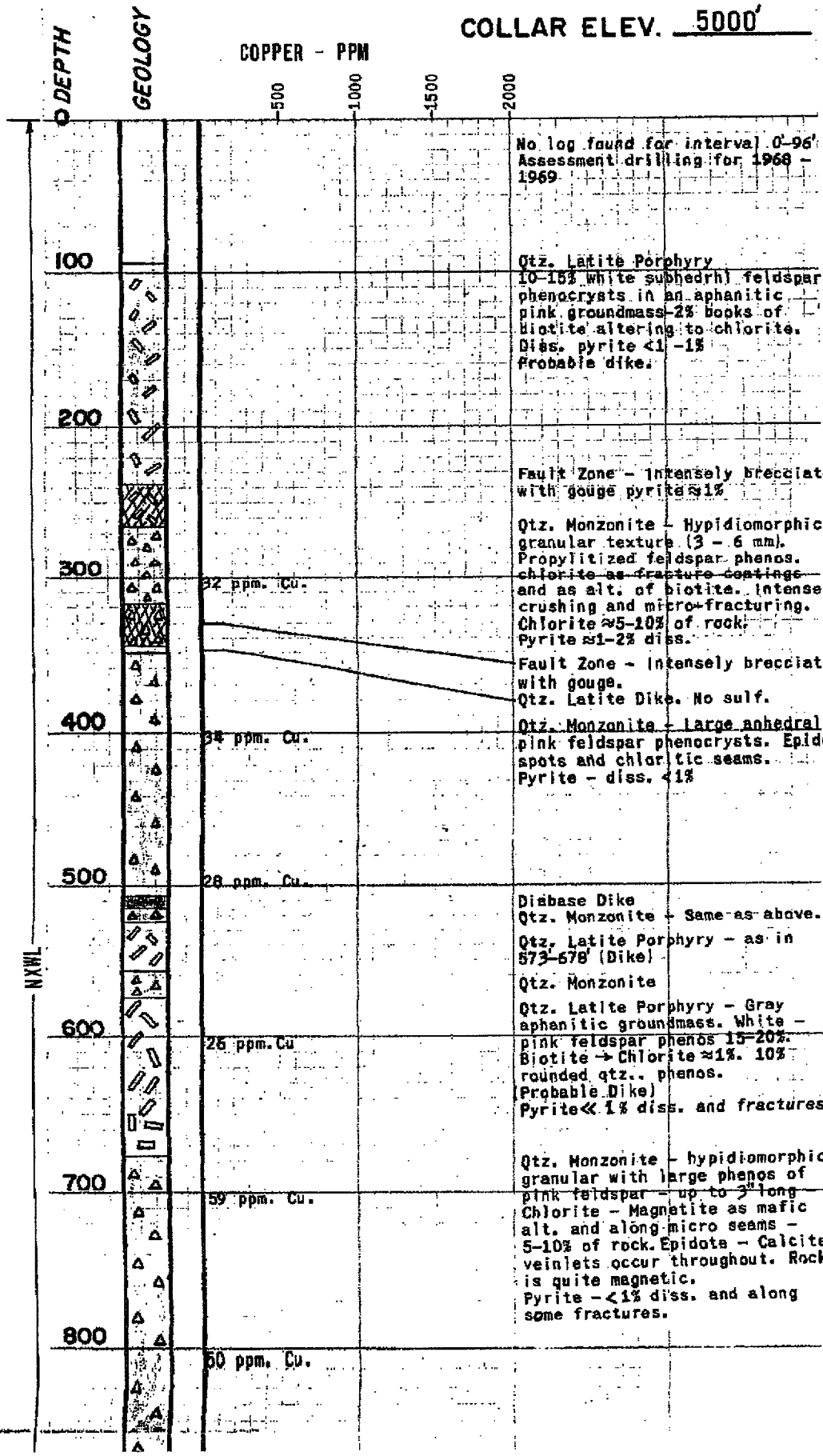
A total of $29,683.31 has been expended to date.

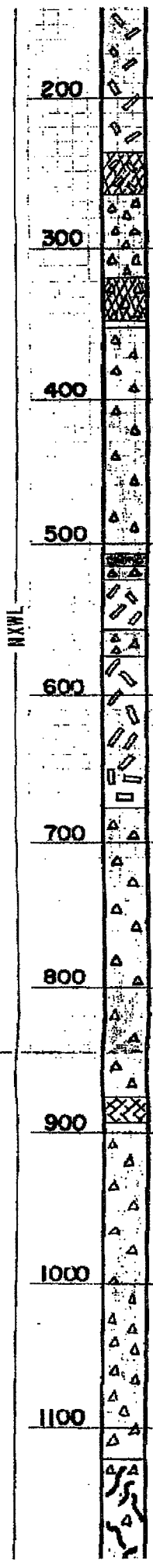
Richard D. Jones

COURTLAND GLEESON WEST EXAMINATION
COCHISE COUNTY, ARIZONA
06 - 03 - 0000

HOLE NO JL-4

COLLAR ELEV. 5000'





Biotite altering to chlorite.
Diss. pyrite <1 -1%
Probable dike.

Fault Zone - Intensely brecciated with gouge pyrite ≈1%

Qtz. Monzonite - Hypidiomorphic granular texture (3 - 6 mm). Propylitized feldspar phenos. chlorite as fracture coatings and as alt. of biotite. Intense crushing and micro-fracturing. Chlorite ≈5-10% of rock. Pyrite ≈1-2% diss.

32 ppm. Cu.

Fault Zone - Intensely brecciated with gouge.
Qtz. Latite Dike. No sulf.

Qtz. Monzonite - Large anhedral pink feldspar phenocrysts. Epidote spots and chloritic seams. Pyrite - diss. <1%

34 ppm. Cu.

28 ppm. Cu.

Diabase Dike
Qtz. Monzonite - Same as above.

Qtz. Latite Porphyry - as in 573'-578' (Dike)

Qtz. Monzonite

Qtz. Latite Porphyry - Gray aphanitic groundmass. White - pink feldspar phenos 15-20%. Biotite → Chlorite ≈1%. 10% rounded qtz.. phenos. (Probable Dike) Pyrite ≪ 1% diss. and fractures

26 ppm. Cu

Qtz. Monzonite - hypidiomorphic granular with large phenos of pink feldspar - up to 2" long - Chlorite - Magnetite as mafic alt. and along micro seams - 5-10% of rock. Epidote - Calcite veinlets occur throughout. Rock is quite magnetic. Pyrite - <1% diss. and along some fractures.

59 ppm. Cu.

50 ppm. Cu.

Intrusive Contact
Brecciated and healed with lower qtz. monzonite - hornfels (?) inclusions. Pyrite ≈2% diss.

29 ppm. Cu.

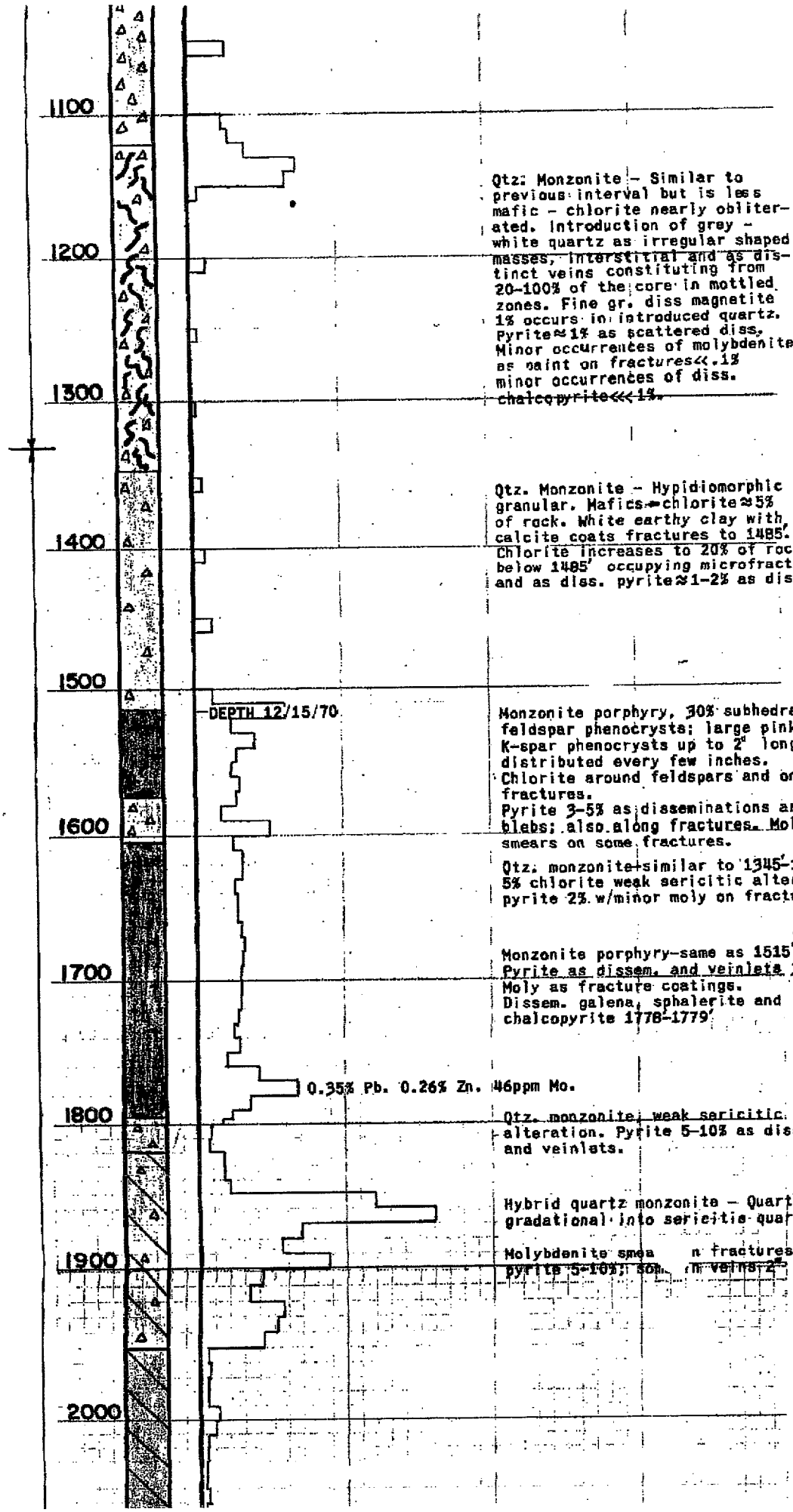
Qtz. Monzonite - Hypidiomorphic granular. Feldspar appears to be weakly sericitic. Chloritic spots assoc./with pyrite. No large pink feldspar phenos or magnetite. Much less chlorite than previous qtz. monzonite intervals. Pyrite ≈5% diss. and frac. controlled.

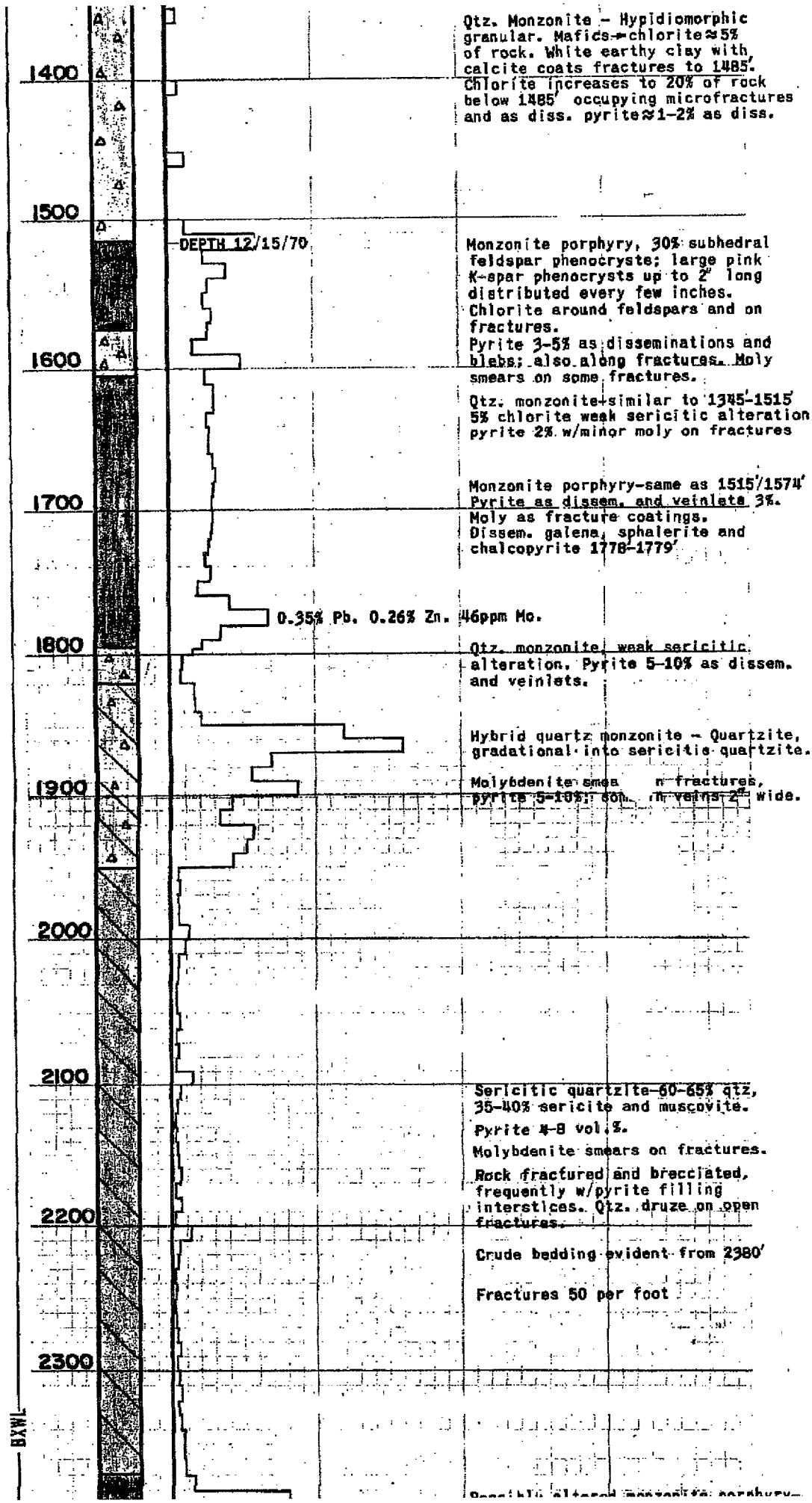
59 ppm. Cu

— DEPTH 12/10/70

57 ppm. Cu.

Qtz. Monzonite - Similar to previous interval but is less mafic - chlorite nearly obliter-


1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
DEPTH 12/15/70
0.35% Pb. 0.26% Zn. 46ppm Mo.
Qtz. Monzonite - Similar to previous interval but is less mafic - chlorite nearly obliterated. Introduction of grey - white quartz as irregular shaped masses, interstitial and as distinct veins constituting from 20-100% of the core in mottled zones. Fine gr. diss magnetite 1% occurs in introduced quartz. Pyrite≈1% as scattered diss. Minor occurrences of molybdenite as paint on fractures<<.1% minor occurrences of diss. chalcopyrite<<<1%.
Qtz. Monzonite - Hypidiomorphic granular. Mafics-chlorite≈5% of rock. White earthy clay with calcite coats fractures to 1485'. Chlorite increases to 20% of rock below 1485' occupying microfractures and as diss. pyrite≈1-2% as diss.
Monzonite porphyry, 30% subhedral feldspar phenocrysts; large pink K-spar phenocrysts up to 2" long distributed every few inches. Chlorite around feldspars and on fractures. Pyrite 3-5% as disseminations and blebs; also along fractures. Moly smears on some fractures.
Qtz. monzonite-similar to 1345'-1515' 5% chlorite weak sericitic alteration, pyrite 2% w/minor moly on fractures
Monzonite porphyry-same as 1515'/1574' Pyrite as dissem. and veinlets 3%. Moly as fracture coatings. Dissem. galena, sphalerite and chalcopyrite 1778'-1779'
Qtz. monzonite; weak sericitic alteration. Pyrite 5-10% as dissem. and veinlets.
Hybrid quartz monzonite - Quartzite, gradational into sericitic quartzite.
Molybdenite smea n fractures, pyrite 5-10%; som. n veins 2" wide.


1400
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BXWL
DEPTH 12/15/70
0.35% Pb. 0.26% Zn. 46ppm Mo.
Qtz. Monzonite - Hypidiomorphic granular. Mafics→chlorite≈5% of rock. White earthy clay with calcite coats fractures to 1485'. Chlorite increases to 20% of rock below 1485' occupying microfractures and as diss. pyrite≈1-2% as diss.
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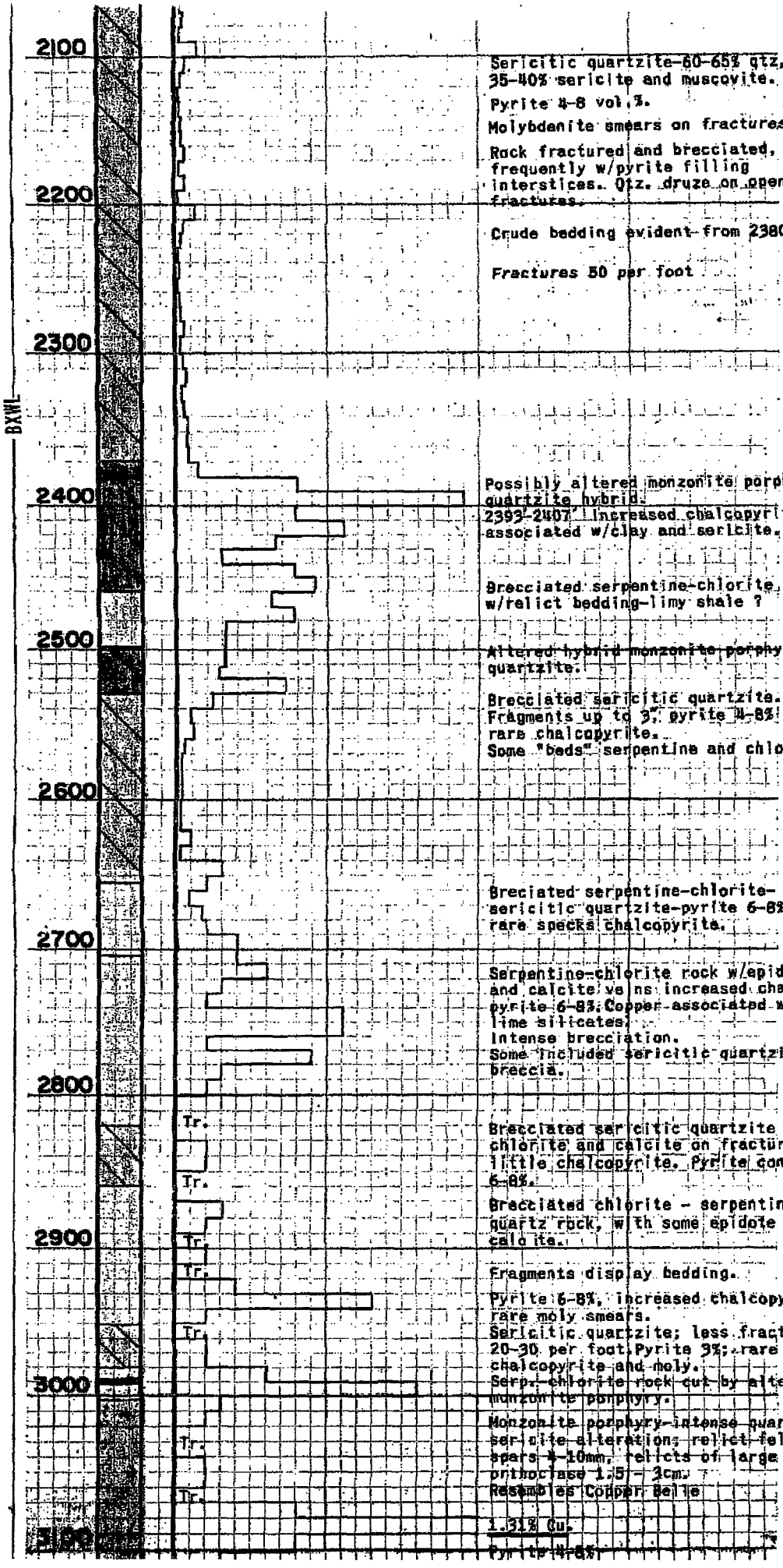
Hybrid quartz monzonite - Quartzite, gradational into sericitic quartzite.
Molybdenite smea n fractures, pyrite 5-10%; son. n veins 2" wide.
Sericitic quartzite-60-65% qtz, 35-40% sericite and muscovite.
Pyrite 4-8 vol.%.
Molybdenite smears on fractures.
Rock fractured and brecciated, frequently w/pyrite filling interstices. Qtz. druze on open fractures.
Crude bedding evident from 2380'
Fractures 50 per foot


BXWL
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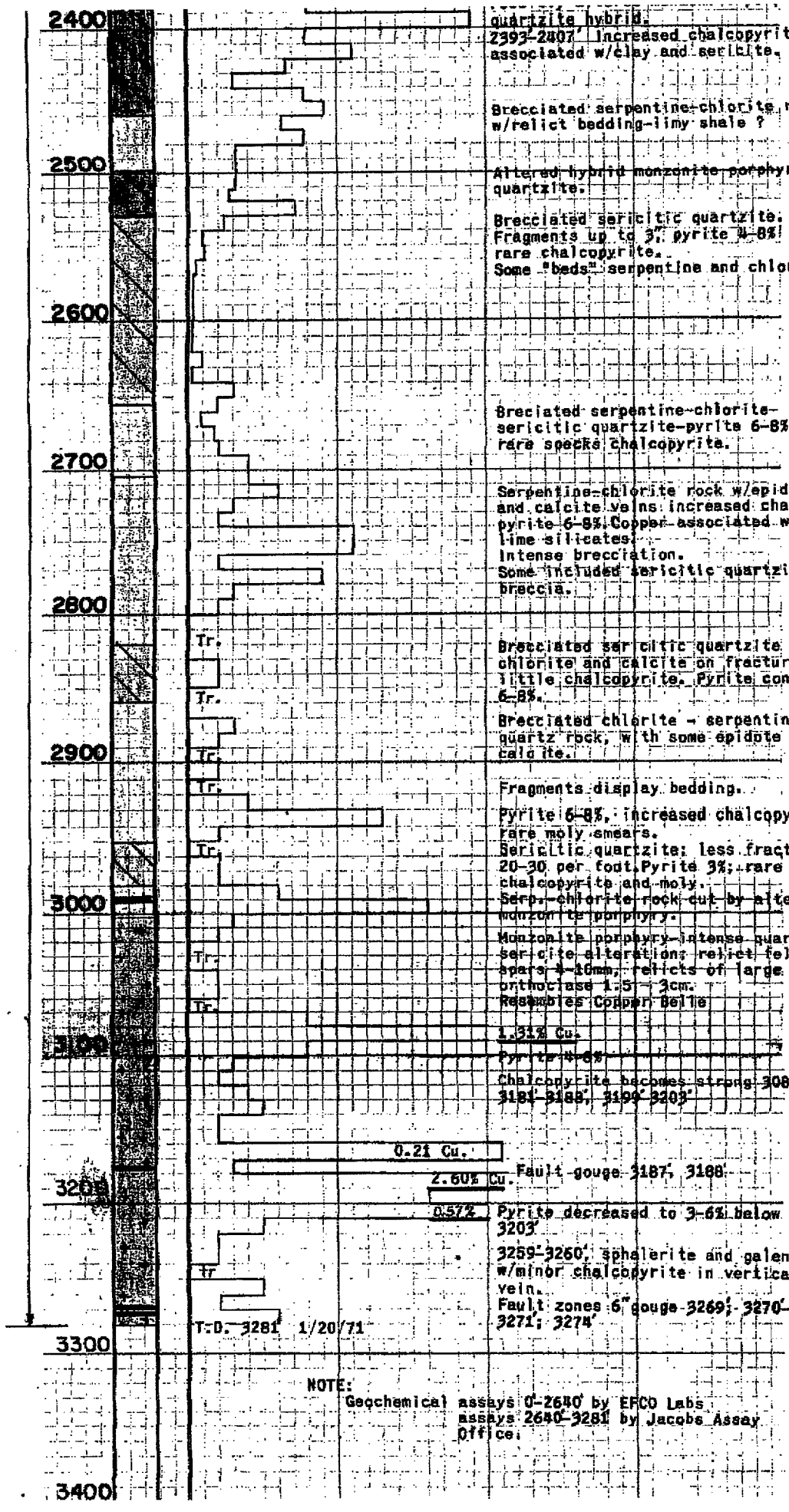
Tr.
Sericitic quartzite-60-65% qtz, 35-40% sericite and muscovite.
Pyrite 4-8 vol.%.
Molybdenite smears on fractures.
Rock fractured and brecciated, frequently w/pyrite filling interstices. Qtz. druze on open fractures.
Crude bedding evident from 2380'
Fractures 50 per foot
Possibly altered monzonite porphyry-quartzite hybrid.
2393'-2407' increased chalcopyrite associated w/clay and sericite.
Brecciated serpentine-chlorite rock w/relict bedding-limy shale ?
Altered hybrid monzonite porphyry-quartzite.
Brecciated sericitic quartzite. Fragments up to 3". pyrite 4-8% rare chalcopyrite.
Some "beds" serpentine and chlorite.
Breciated serpentine-chlorite-sericitic quartzite-pyrite 6-8%, rare specks chalcopyrite.
Serpentine-chlorite rock w/epidote and calcite veins increased chalcopyrite; pyrite 6-8%. Copper associated with lime silicates.
Intense brecciation.
Some included sericitic quartzite breccia.
Brecciated sericitic quartzite with chlorite and calcite on fractures-little chalcopyrite. Pyrite continues 6-8%.
Brecciated chlorite - serpentine-quartz rock, with some epidote and calcite.
Fragments display bedding.
Pyrite 6-8%, increased chalcopyrite, rare moly smears.
Sericitic quartzite; less fractured, 20-30 per foot. Pyrite 3%; rare chalcopyrite and moly.
Serp.-chlorite rock cut by altered monzonite porphyry.
Monzonite porphyry-intense quartz-sericite alteration; relict feldspars 4-10mm, relicts of large orthoclase 1.5 - 3cm.
Resembles Copper Belle
1.31% Cu.
Pyrite 4-8%



quartzite hybrid.
2393'-2407' increased chalcopyrite associated w/clay and sericite.

Brecciated serpentine-chlorite rock w/relict bedding-limy shale ?

Altered hybrid monzonite porphyry-quartzite.

Brecciated sericitic quartzite. Fragments up to 3", pyrite 4-8% rare chalcopyrite.
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Fragments display bedding.

Pyrite 6-8%, increased chalcopyrite, rare moly smears.
Sericitic quartzite: less fractured, 20-30 per foot. Pyrite 3%; rare chalcopyrite and moly.
Serp.-chlorite rock cut by altered monzonite porphyry.

Monzonite porphyry-intense quartz-sericite alteration; relict feldspars 4-10mm, relicts of large orthoclase 1.5 - 3cm.
Resembles Copper Belle

1.31% Cu.

Pyrite 4-6%

Chalcopyrite becomes strong 3082'-3088', 3181'-3188', 3199'-3203'

Fault gouge 3187', 3188'

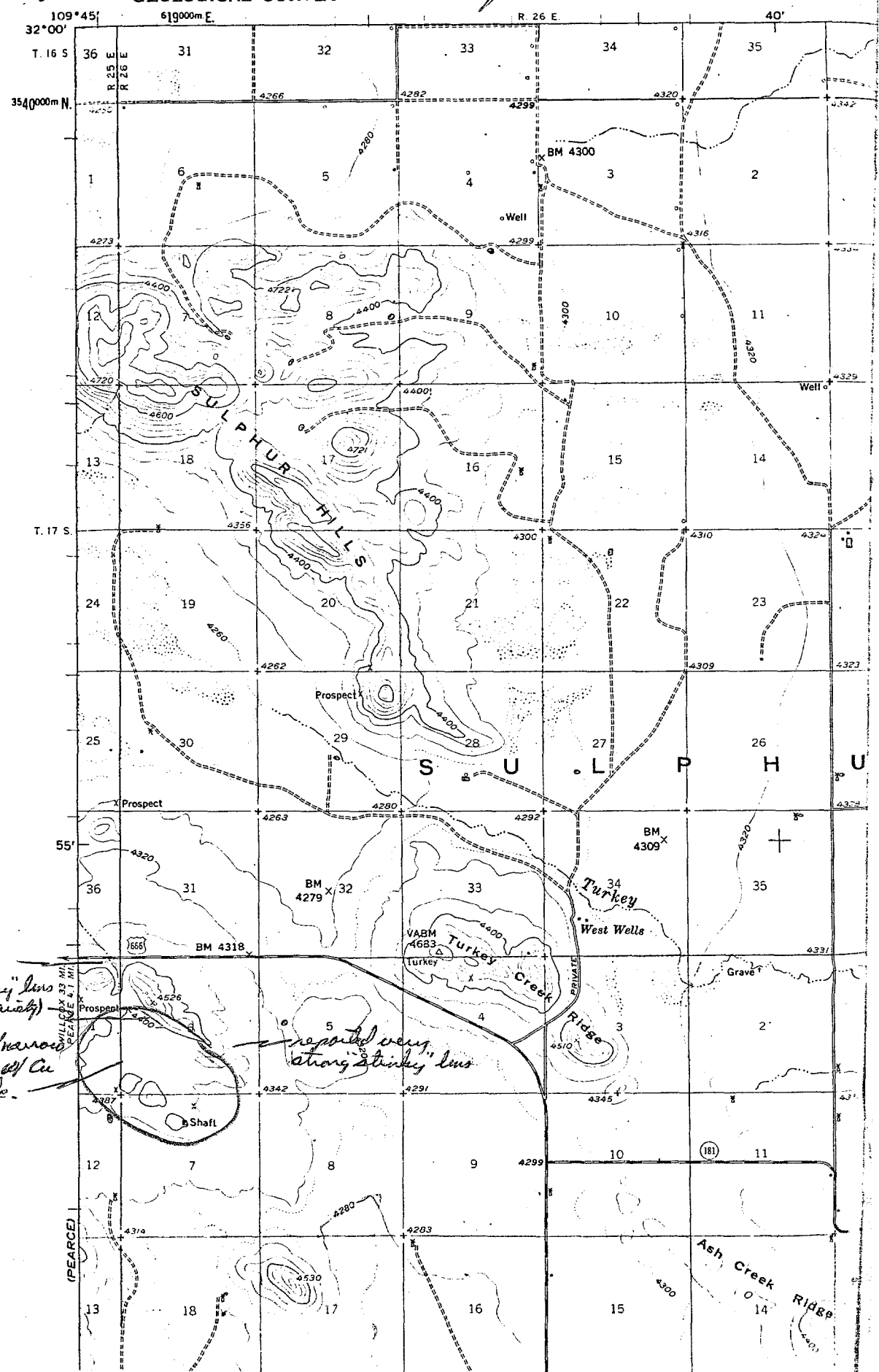
Pyrite decreased to 3-6% below 3203'

3259'-3260', sphalerite and galena w/minor chalcopyrite in vertical vein.
Fault zones 6" gouge 3269'; 3270'-3271'; 3274'

NOTE:
Geochemical assays 0-2640' by EFCO Labs
assays 2640'-3281' by Jacobs Assay Office.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Square Top Hills Quad



lens "stinky" lens (repl. variety)

area of narrow shear w/ Cu in vole.

reported very strong "stinky" lens

Turquoise
Courtland-Gleason

JDSELL

11/10/88
TURQUOISE
PROJ

WFK →

Called Back Fred Jenkins
SANTA FE / PACIFIC 505-881-3000
(ABQ)
- Gave him General
Range of TD's (320-800')
plus "overburden" THICKNESS (0-505')
For COIT 1-8 (Chuck Dai)
(1953-55 JHK project)
He has hole locations - ABVS smo open data from UNION OIL CO
He might be interested in getting more specific data & said he would call you.

SEC 27
28
T19S
R25E

SF/P still controls all
Real Estate min. holdings of SANTA FE &
S. PAC. LAND Co.

WK

File Memo.

Quintana
Courtland - Gleason area
Cochise Co., Ariz

Bruce Kilpatrick (11/7/73) stated they Quintana has terminated their drilling at Courtland - Gleason. ~~Apparently~~ Apparently they did not find what they were after as Bruce stated he had made every kind of X-section he could think of & yet WES was not happy with them.

Bruce thought they would "hang in" for another go around.

JWD

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

August 2, 1972

FILE MEMORANDUM

Don Bülmer called to inquire about enrichment in the porphyry west of Nogales (Fronteria prospect) as he is compiling an "enrichment" map.

I inquired about their new work at Gleeson and he said they now had eight holes in -- all show something different but encouraging. Drilling to ± 3,000 feet. Structure very complex and still not solved.

Jim
J. D. Sell

JDS:lad

cc: WLKurtz

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

February 20, 1974

Mr. T. C. Osborne
Asst. Director of Exploration
New York Office

Bear Creek Mining Company
Courtland-Gleeson District
Cochise County, Arizona

Dear Mr. Osborne:

Attached is a copy of Messrs. Graybeal's and Sell's evaluation of Bear Creek Mining Company's data on the Courtland-Gleeson District, Arizona. This is one of the few Arizona districts that have had appreciable copper, lead, and zinc production in which a porphyry copper deposit has not been discovered. The district contains widespread pervasive quartz-sericite-pyrite alteration both exposed and concealed and favorable geochemical and alteration patterns.

We believe the large amount of previous drilling has not eliminated the possibility of finding a deep (3-5,000') primary porphyry copper and the district represents a well-above-average exploration gamble. However, even with the large amount of previous drilling, to adequately explore such a large and structurally complex district, we need to be prepared for a several-year exploration program.

Land payments are most unfavorable -- approximately $50,000 per year with about a 2 million dollar price maturing in 1976 ($240,000), 1977 ($1,100,000), and 1978 ($750,000). Asarco would have to spend one million dollars to earn a 50% interest.

On the basis of the above land situation, I do not recommend a joint venture with Bear Creek. Perhaps at some future date the district may be acquired on better land terms.

Very truly yours,

W. L. Kurtz

W. L. Kurtz

WLK:lb
Attach.

cc: JHCourtright - w/attach.
JDSell - w/o attach.
FTGraybeal - w/o attach.

J. D. S. Copy

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

February 6, 1974

Report to: W. L. Kurtz

From: F. T. Graybeal
J. D. Sell

Evaluation of Bear Creek's
Courtland-Gleeson property,
Cochise County, Arizona

SUMMARY AND RECOMMENDATIONS

Bear Creek recently discovered a large zone of strong quartz-sericite-pyrite alteration with minor chalcopyrite and molybdenite which lies at depth beneath fresh surface rocks. They attempt to explain the concealed mineralization as a result of offset along post-mineral flat faults. However, our study of the core indicates that these faults are pre-mineral. A reconstruction of lateral and vertical alteration-mineralization patterns suggests the presence of a center of mineralization which can be tested with a single 5000 ft. drill hole. Forthcoming option payments are steep, but are, we believe, justified by the large body of data available with which to guide further exploration and we recommend acquisition of the property.

INTRODUCTION

On January 8, 1974 we began an intensive review of information held by Bear Creek Mining Co. concerning the Courtland-Gleeson district, Arizona. This area is located about 16 miles east of Tombstone, as shown on Figure 1. The maps and sections presented below are somewhat simplified from the detailed work by Bear Creek to show only the important aspects of the district.

In the period 1960-1962 Bear Creek drilled 28 holes to depths of up to 1000 ft. looking for a chalcocite blanket in the northeast part of the district. In 1967 they reinterpreted the geology using a San Manuel-Kalamazoo model and drilled several 2000 ft. holes. Since 1969 they have drilled 9 holes at depths of from 2500-4000 ft. to test a deep induced polarization anomaly in the southwest part of the district. Although this most recent work failed to locate ore grade mineralization, it did indicate the presence of a large zone of quartz-sericite-pyrite beneath fresh rocks and below what they interpreted as a flat fault. Locally anomalous amounts of Cu, Mo, Pb, and Zn occur within this zone.

In 1973 Quintana Minerals drilled 3 holes 3500 ft. west of the Bear Creek drilling, presumably looking for the root of the mineralization exposed farther to the east. They also accepted Bear Creek's flat fault

theories. The Quintana results indicate that alteration was generally weak to depths of 3500 ft. and may limit the quartz-sericite-pyrite zone on the west.

To date these drilling programs have not found ore grade rock. Our review cast considerable doubt on the Bear Creek and Quintana structural interpretations and indicated that the deep porphyry copper potential of the district was not yet sufficiently tested.

LAND STATUS

The location of land owned or controlled by Bear Creek is shown on Plate 1. The details of ownership, including option and rental payments and work requirements, are shown on Table 1. Of greatest importance are the option payments to Christiansen, Cowan, and Spaulding which total roughly $50,000 and of which about $40,000 will be due by the end of March 1974.

Although some of the lands listed on Table 1 could be dropped, the three options listed above are critical to further exploration in the district and would have to be retained.

Our assessment of the present situation in Bear Creek indicates that a considerable amount of this ground may be dropped if a partner is not found. We were informed that several other companies are reviewing the data; however, the large amount of dust on the core boxes suggested their reviews are not yet serious. The recent hiring of D. Snyder, formerly Bear Creek's district manager, by Kerr-McGee could advance the latter to a position of a serious competitor for the property.

GEOLOGY

The geology of the Courtland-Gleeson area is complicated by extensive flat faulting. Upper plate rocks consisting of Jurassic Gleeson quartz monzonite, Jurassic-Cretaceous Copper Belle dacite-latite porphyry, and Paleozoic sedimentary rocks have been moved eastward(?) over Cretaceous Bisbee group sedimentary rocks along the Courtland thrust. This thrust, exposed in the northeastern part of the district (shown on Plate 1), has been cut by several drill holes and appears to dip westerly at a very shallow angle (see AA', Plate 2). Bear Creek has interpreted the Courtland thrust as a post-mineral structure which has offset the mineralized limestones in the eastern part of the district from the root, thought to lie at depth to the west or southwest.

The Copper Belle rocks, which are exposed at the surface mostly east of the Dragoon fault as an irregular area of dikes, sills, and stocks, are thought to be the genetic source of the mineralization. Hole CG-11 which is located about one-half mile east of CG-23 and about 2300 ft. southeast

of section AA' penetrated 1201 ft. of Copper Belle. However, other data suggest rather strongly that the Courtland thrust is about 700 ft. deep in this area, indicating that the Copper Belle rocks may cut the thrust. Thus, the Courtland thrust may have controlled the emplacement of the Copper Belle rocks and subsequent mineralization.

ALTERATION-MINERALIZATION

The surface extent of strong alteration and mineralization is shown on Plate 1. This zone appears to dip westerly at a shallow angle, as shown on sections AA' and BB' on Plate 2, and post-mineral normal offset along the steep-dipping Dragoon fault appears likely. The thickest zone of strong alteration, projected to the surface, is shown on Plate 1, and it centers on holes CG-32A, 34, 38, 39, and JL-4. This zone also contains small amounts of chalcopyrite and molybdenite. We examined detailed skeleton core from these and other holes (1 sample every 2 ft.) and are completely convinced that the transition from fresh rock at the surface through propylitic to strong phyllic alteration at depth is entirely gradational. Attempts by Quintana and Bear Creek to separate fresh surface rocks from strongly altered rocks at depth with one or more flat faults are obviously incorrect.

We interpret the Courtland thrust as pre-mineral, although this structure may exist at considerable depth west of the Dragoon fault, possibly cutting off the mineralization. However, we have noted both from drill logs and examination of the core that the intensity of alteration and mineralization in the Bisbee group rocks below the Courtland thrust increases in a westerly direction. Also, Copper Belle rocks, which are in contact with the Bisbee group in several places, show no shearing as the contact is approached which may suggest emplacement along a pre-existing fault plane. These observations suggest the presence of a mineralized core in the footwall of the Courtland thrust in the general area between holes CG-29a, 32a, and 39 which is coincident with the area of strong mineralization cut by these same holes. The highest Cu, Mo, and sulfide contents (as determined by sulfur assay) in this area are encountered in holes CG-29a, 32a, 34, 38, and JL-4.

RECOMMENDATIONS FOR FURTHER EXPLORATION

The area which we feel is most favorable for further exploration is shown on Plate 1. It is centered over the southern portion of the concealed deep altered zone in an area of abundant concealed Copper Belle rocks. In addition, the bottom 500 ft. of holes CG-32a and 34 show a considerably greater abundance of pyrite veins as compared to all other holes. Testing of this target could be accomplished with a single 5000 ft. drill hole. Favorable aspects of this target area and of the district in general are:

1) a large zone of exposed and concealed quartz-sericite-pyrite

2) a recognizable center of coincident strong alteration, mineralization, and geochemical values

3) alteration zoning which is coincident with accepted models

4) a new working hypothesis involving thrust fault control of the mineralization, and

5) a past copper production exceeding that of the Pima, Silver Bell, and San Manuel districts prior to discovery of porphyry ores.

Unfavorable aspects of the target area are:

1) depth to postulated ore zone is 3000-5000 ft.

2) considerable uncertainty in the interpretation of the structural history of the district

3) forthcoming option-rental payments.

Several alternative target areas were also considered. The Shannon mine area (just east of Gleeson) may have a potential for replacement mineralization in the favorable Abrigo formation at depth, but the size of this zone appears limited by large masses of Copper Belle rocks. A second alternative is to deepen CG-6 to test for the continuity of surface mineralization below the Courtland thrust. This alternative interprets the exposed alteration and mineralization as the top of a dome-like zone which expands rapidly with depth, at least to the west. Also, a target in this area would possibly be less deep than under the concealed mineralization to the west. However, the presence of fresh Bisbee group rocks in CG-23 suggests that alteration below the Courtland thrust is not pervasive in this area. Further evaluation of these alternatives would be made if the property is acquired.

We currently feel that the large amount of drilling presently favors the target shown on Plate 1. Although the land payments are expensive, we believe they are more than offset by the large body of data available and we recommend acquisition of the property.

F. T. Graybeal

F. T. Graybeal

J. D. Sell

J. D. Sell

FTG/JDS:lb

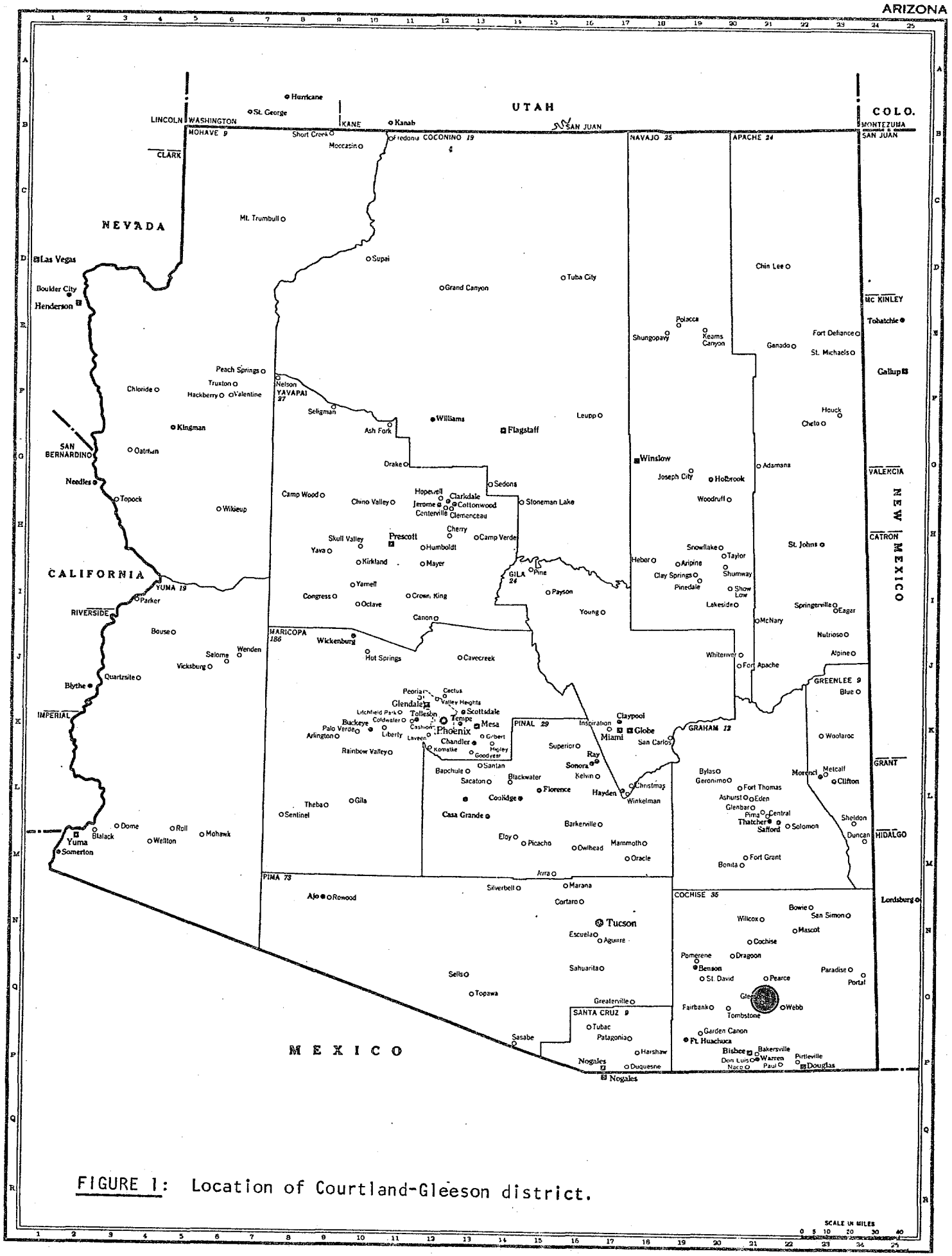
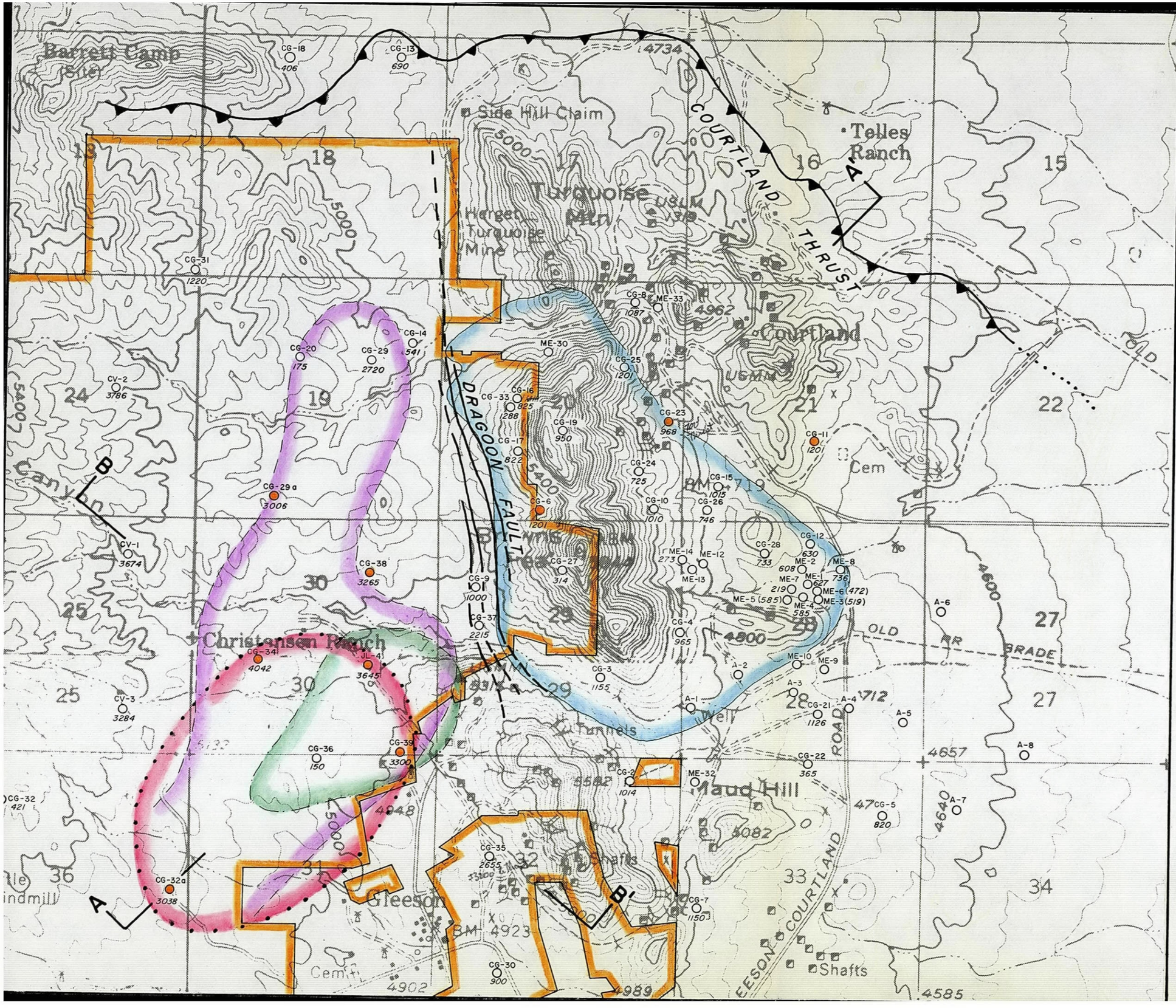


FIGURE 1: Location of Courtland-Gleeson district.

TABLE 1: COURTLAND-GLEESON EXAMINATION
COCHISE COUNTY, ARIZONA
OPTION PAYMENTS AND WORK REQUIREMENTS FOR 1974

Landowner or Optionor & Type of Agreement	Claims or Acreage Held by BCMC	Acquired	Expires	Option or Rental Payments		Work Requirement		Remarks
				Date Due	Amount	Type	Cost	
State Prospecting Permits								
20170	480 19 T19S R25E	4/22/71	4/22/76	4/22/74	$480.00	Assessment	$ 9,600	
20171	129.15 32 T19S R25E	4/22/71	4/22/76	4/22/74	129.15	Assessment	2,583	
22504	40 25 T19S R24E	2/13/73	2/12/78	--	--	Assessment	400	Will Drop
22505	320 26 T19S R24E	2/13/73	2/12/78	--	--	Assessment	3,200	Will Drop
22506	600 35 T19S R24E	2/13/73	2/12/78	--	--	Assessment	6,000	Will Drop
23672	160 13 T19S R24E	5/22/73	5/21/78	--	--	Assessment	1,600	
24877	280 36 T19S R24E	8/31/73	8/30/78	--	--	Assessment	2,800	
Bear Creek Claims	72 unpat lode claims	1968-71	--	--	--	Assessment	7,200	
Roy Christiansen et al Option Agreement	1,648 acres	3/27/70	3/27/78	3/27/74	21,000.			
Robert Earl Cowan Option Agreement	1,379.66 acres	9/28/72	9/28/77	3/28/74 9/28/74	10,000 10,000	--	--	
Robert Earl Cowan Option Agreement	440 acres	1/15/73	1/15/78	1/15/74 7/15/74	1,350 1,350	--	--	Will Drop
Shannon Mining Co. Option Agreement	Patented claims 369.893 acres	9/1/71	9/1/76	9/1/74	4,000	--	--	
Carlton Spalding et al. Option Agreement	22 unpat lode claims	4/28/72	4/28/77	4/14/74	10,000	Assessment	2,200	
			Totals		$58,309.15		$35,583	
			Totals not including lands to be dropped		$55,639.15		$25,983	

Plate 1



EXPLANATION

Outline of strong surface alteration & mineralization

Outline of +2000' thickness of concealed strong alteration-mineralization from deep drilling

Outline of +1000' thickness of concealed Copper Bell rocks

Outline of projected deep target

CG-35 2655 — Diamond drill holes showing total depth

CG - Bear Creek

ME - Minex (Union Oil)

A - ASARCO

● - Drill holes mentioned in text of accompanying report

Outline of ground controlled by Bear Creek

TO ACCOMPANY Report

DATED Feb. 6, 1974

BY F.T. Graybeal-J.D. Sell

MINERALIZATION & LAND STATUS

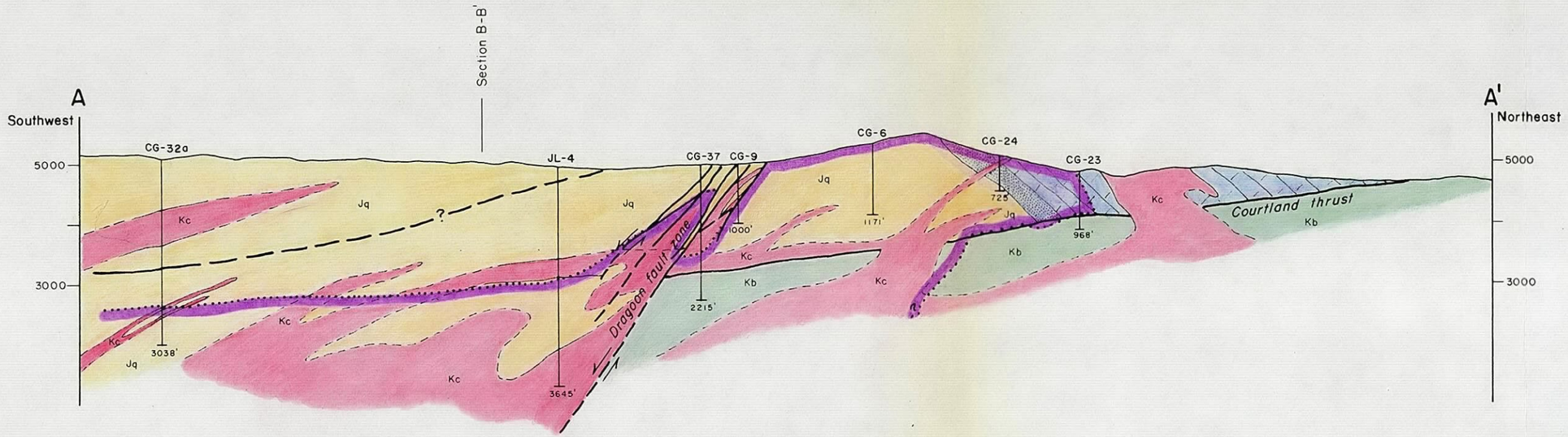
COURTLAND-GLEESON DISTRICT

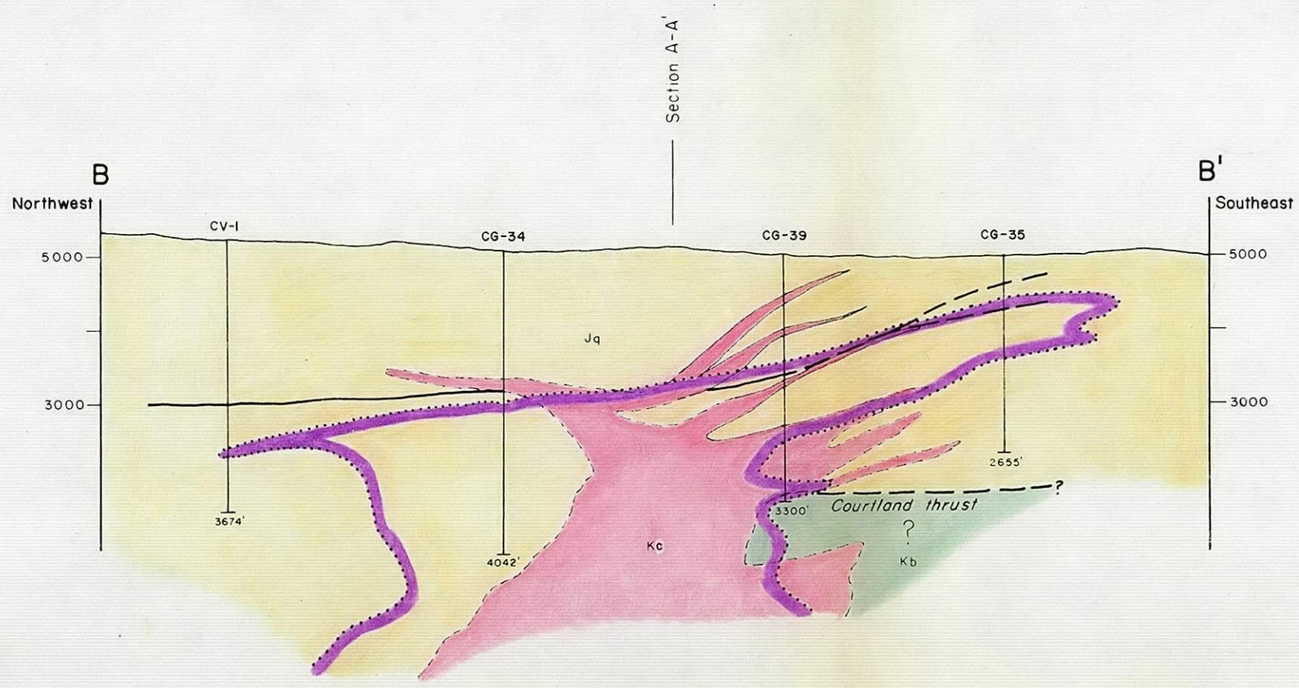
Cochise County, Arizona

Scale: 1" = 2000'

F.T.G. Feb. 1974

MVK 2704





EXPLANATION

- Kb — Bisbee group
- Kc — Copper Belle
- Jq — Gleeson quartz monzonite
- Paleozoic rocks; Bolsa-stippled, Limestones-lined
- Fault
- Limit of strong alteration

TO ACCOMPANY Report
DATED Feb. 6, 1974
BY F.T. Graybeal & J.D. Sell

GEOLOGIC SECTIONS

COURTLAND-GLEESON DISTRIC

Cochise County, Arizona

Scale: 1" = 2000'

F.T.G. Feb. 1974

1941 Report

Holes 1-12 bottom unit

R 24 E | R 25 E

13 | 18 | 17 | 16

Turquoise Mtn.

2 PFE

4 PFE

Limit of I.P. Response

6 PFE

CG-29 2720'

CV-2 3786'

24 | 19 | 20 | 21

CG-33 1288'

Small Secondary Cu deposit

CG-29A 3006'

CV-1 3674'

CG-38 3265'

10 PFE

8 PFE

Brown's Peak

CG-37 2215'

25 | 30 | 29 | 28

Small Primary Copper Deposit (Minerals Exploration Inc.)

CG-34 4042'

JL-4 3645'

CV-3 3284'

CG-37 3300'

6 PFE

36 | 31 | 32 | 33

CG-35 2655'

CG-32A 3038'

4 PFE

Limit of IP Response

T 19S

T 20S

g Gleeson

t Tungsten gm

c Copper Wells gm

Boundary of property controlled by BCMC

Contours on I.P. values

Area of intense surface mineralization-alteration

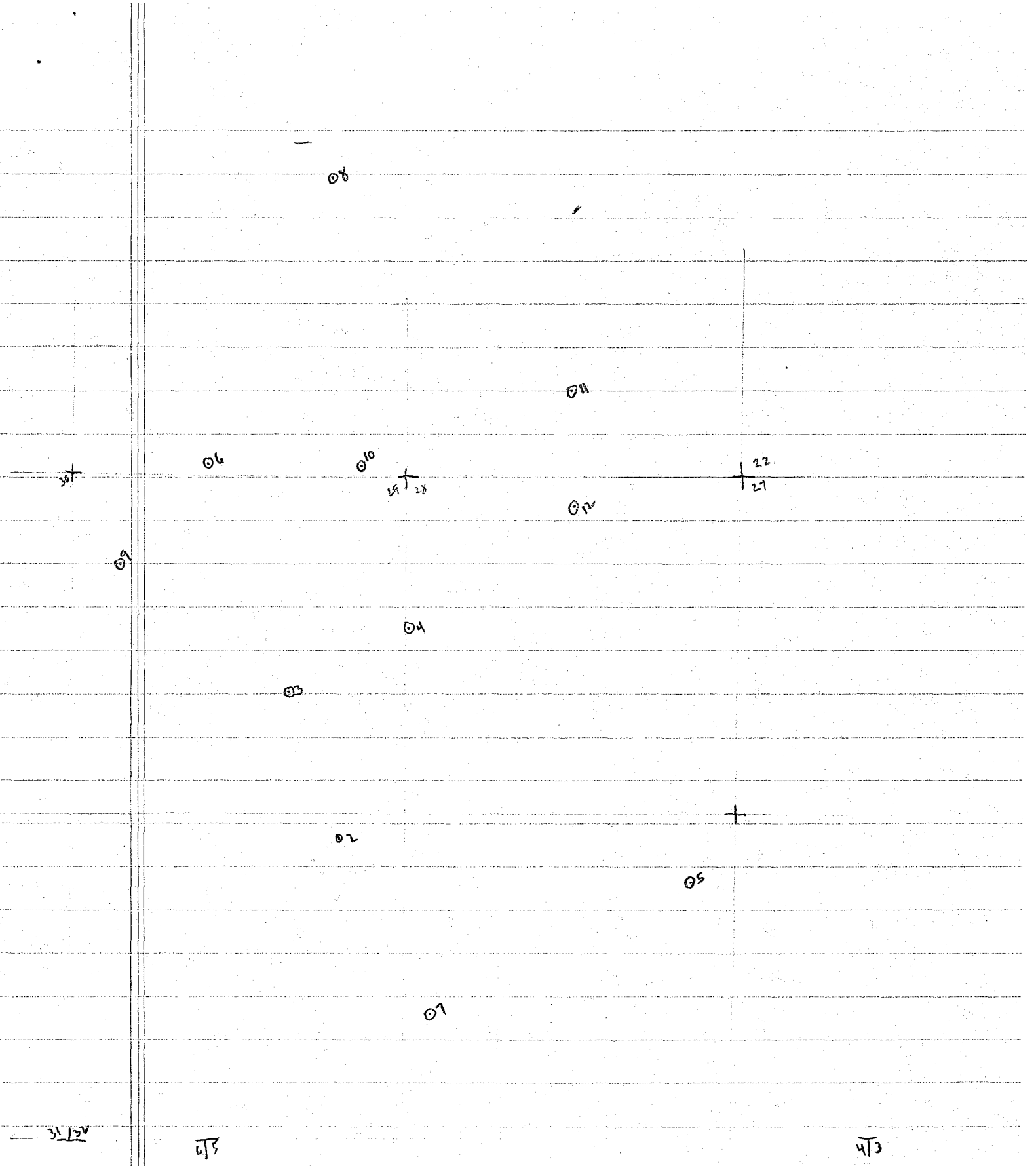
COURTLAND GLEESON

Cochise County

Arizona

0 1000 2000 3000 Feet

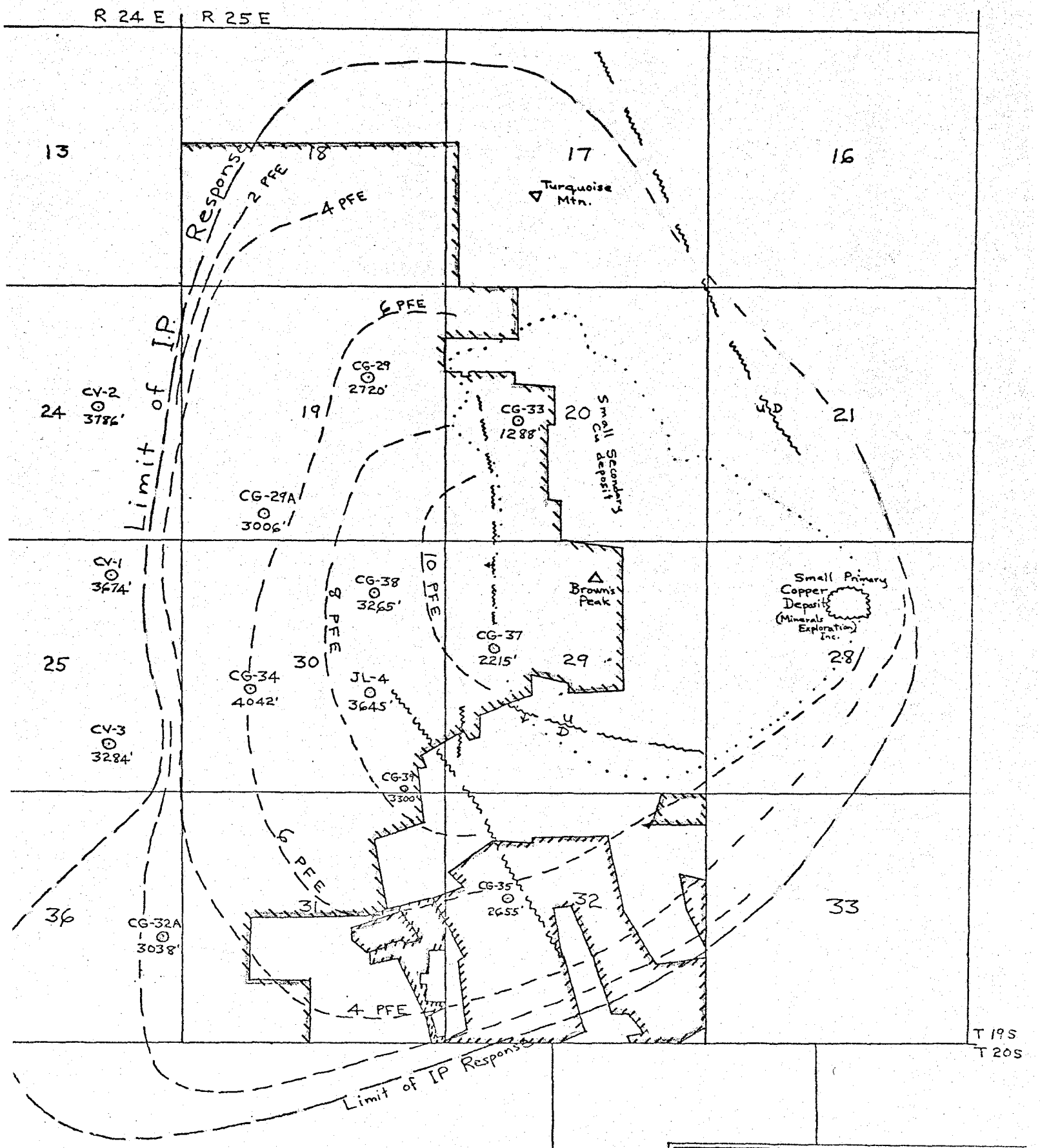
BCMC-TO GFL 7/24/72 12/31/73



KCC
1st 12 drill hole site
Courtland-Gleason

1" = 2000'

01



Boundary of property controlled by BCMC

Contours on I.P. values

Area of intense surface mineralization-alteration

COURTLAND GLEESON
Cochise County
Arizona

0 1000 2000 3000
Feet

BCMC-TO GFL 7/24/72 12/31/73

J.D. SELL

W. L. K.

MAY 23 1974

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

May 17, 1974

MEMORANDUM FOR: FILE

COURTLAND-GLEASON
COCHISE COUNTY, ARIZONA

Reference is made to Mr. Kurtz's February 20 letter to Mr. Osborne on Bear Creeks' prospect with a report by Messrs. Graybeal and Sell.

Bear Creek has since renegotiated terms with the owners, deferring payments and providing a more reasonable deal whereby there is ample time to carry out exploration with relatively minor sums required for property obligations.

After examining drill core representing some of the key penetrations I can agree with critical interpretations of the report ---- that the major displacements on low angle faults are likely premineral in age and that a sizeable porphyry copper phyllic zone existing in the southwestern part of the area could be underlain by potassic alteration containing ore-grade primary copper mineralization.

The probable depth of such an occurrence is highly speculative. Since the top of the phyllic zone, as indicated by the 4 holes in the periphery of the "Projected Deep Target" (Plate 1 of the Report), is down around 2000 feet, the top of the potassic zone might well lie below 4000 or 5000 feet. But, due to the wide spacing of the holes, a somewhat lesser depth is at least possible. Although a rather high risk exploration gamble is involved, a major sized porphyry copper deposit could exist and a drill test of two holes ($250,000 cost, including claim assessment work) is warranted, I believe.

J. H. Courtright

J. H. Courtright

JHC:vmh

cc: J. J. Collins
W. L. Kurtz

ASARCO EXPLORATION RECORD

JNS

☐ FIELD EXAMINATION ☐ LITERATURE SEARCH ☐ ASARCO FILE ☒ Submittal

Section I General Indexing

① Name(s) of Property or Area	② Country	③ State or Province
COURTLAND-GLEESON	U.S.A.	Arizona
	④ Co. or Map Sheet: Cochise Co.	⑤ File or Gore No.: Aa-3.20B.3

⑥ Latitude	⑦ Longitude	⑧ Mer.	Tws.	Rng.	Sec.	⑨ Examined by	⑩ Date
31°45'N	109°49'W	G&SR	19S	25E	16-33	J.D. Sell & F.T. Graybeal	Jan. 1974
						⑪ Office: Tucson	⑫ Field Days: 2

Section II Sources of Information

⑬ References

Author	Date	Title	Publications	Vol. No.
Bear Creek Mining Company files				

Section III Appraisal

⑭ Recommendations
- ☒ Action Now
- ☐ Too Low Grade
- ☐ Too Small
- ☐ Ownership Problem
- ☐ Access Problem
- ☐

⑮
- ☒ Past Producer
- ☐ Producer
- ☐ Mineral Deposit
- ☐ Prospect
- ☒ Jt. Venture
- ☐ Geologic Concept
- ☐ Geochem Anomaly
- ☐ Geophy. Anomaly
- ☐

⑯ Production

Commodity	Tons	Grade
Cu	60 million	lbs.

⑰ Reserves ☐ Measured ☒ Estimated

Commodity	Tons	Grade
Minex (Cu)	1 million	1.2%

⑱ Num. Drill Holes 39
Approx. Total Footage 70,000

⑲ Excavations: Numerous old mines.

⑳ Spectro. Analysis Attached

㉑ Assays Attached

㉒ Geochem Results Attached

Section IV Geologic Data

㉓ Commodity or Contained Metals: Copper

㉔ Ore Minerals - Major: chalcopyrite; Minor: chalcocite, CuOx

㉕ Host Rocks - Major: limestone, granite, porphyry; Minor:

㉖ Age of Host Rocks: Paleozoic, Mesozoic, Mesozoic

㉗ Environment: Porphyry copper, possible strong regional tilting and post-mineral flat faulting.

㉘ Alteration: Pervasive quartz-sericite, exposed and concealed.

㉙ Total Extent: 4-5 square miles

㉚ Structure: Thrust faulting puts granite over Cretaceous clastic rocks; may be pre-mineral.

㉛ Ore Occurrence: Old production was high grade Cu sulfide-oxide replacement of limestone; thin very low grade chalcocite blanket; potential for diss. vein chalcopyrite.

㉜ Age of Mineralization: 100 m.y.

㉝ Conclusions and Recommendations: Existence of widespread quartz-sericite cut in several deep (+3000 ft.) drill holes suggests presence of a deep primary chalcopyrite zone. Recommend ASARCO acquire and drill.

JHC - JDS → [illegible]

W. L. K.
SEP 17 1975

ASARCO Incorporated
Tucson Arizona

September 15, 1975

FILE MEMORANDUM

FROM: F. T. GRAYBEAL

COURTLAND-GLEESON

Norm Lehman informs me that St. Joe has optioned the Courtland-Gleeson area from Bear Creek. They plan to drill one hole NE of JL-4 and west of the ridge looking for hypogene mineralization. Kalaf will hammer the hole to start and Joy will core at depth.

He didn't specify depth, but noted that St. Joe considers 4000 feet deep. He wanted to know how deep we drilled at Charleston so he could use this to argue for a deeper hole. He had heard independently from both Clark Arnold and John Beeder that the Charleston holes exceeded 6500 feet.

F. T. Graybeal

F. T. Graybeal

FTG:vh

ASARCO

Southwestern Exploration Division

June 30, 1976

TO: F. T. Graybeal

FROM: S. R. Davis

St. Joe Drilling
Gleeson, Arizona

St. Joe Mining Company recently completed three deep drill holes in the Turquoise Mining District north of Gleeson, Arizona. Due to the area being heavily posted, only one site could be definitely established (SJ-1 on the attached map). This was apparently the deepest hole of the three and was drilled from the surface by St. Joe.

The two other holes, according to local sources, were deepening of pre-existing drill holes. These two reentered holes were reported to be to the north and south of Christensen's Ranch. The road to CG-36 has been heavily traveled, and it is very likely one of the two. The other hole which was reentered may have been CG-6 or CG-17.

Local sources say that three more sites are under consideration or being prepared in this same area for Joy Drilling Company. A new(?) site, with some equipment parked on it, is located directly northeast of CG-6 (see map).

Although Norm Lehman of St. Joe expressed some optimism during the active stage of drilling, I have not talked to him recently and am not aware of any definite drilling plans.

While in the area, I was told that a Boyles Brothers drilling rig was active on the Harmon (Double U) Ranch, possibly in the Signal Hill-Gold Camp area southwest of Gleeson. I could neither confirm this nor determine what company might be involved in the area.

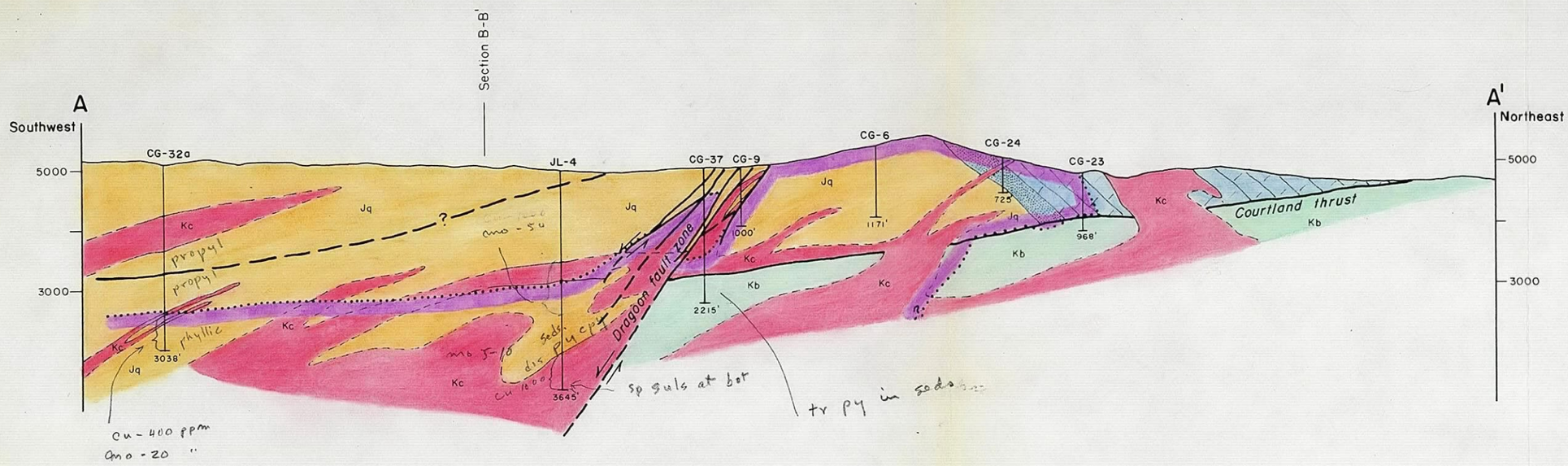
S. R. Davis

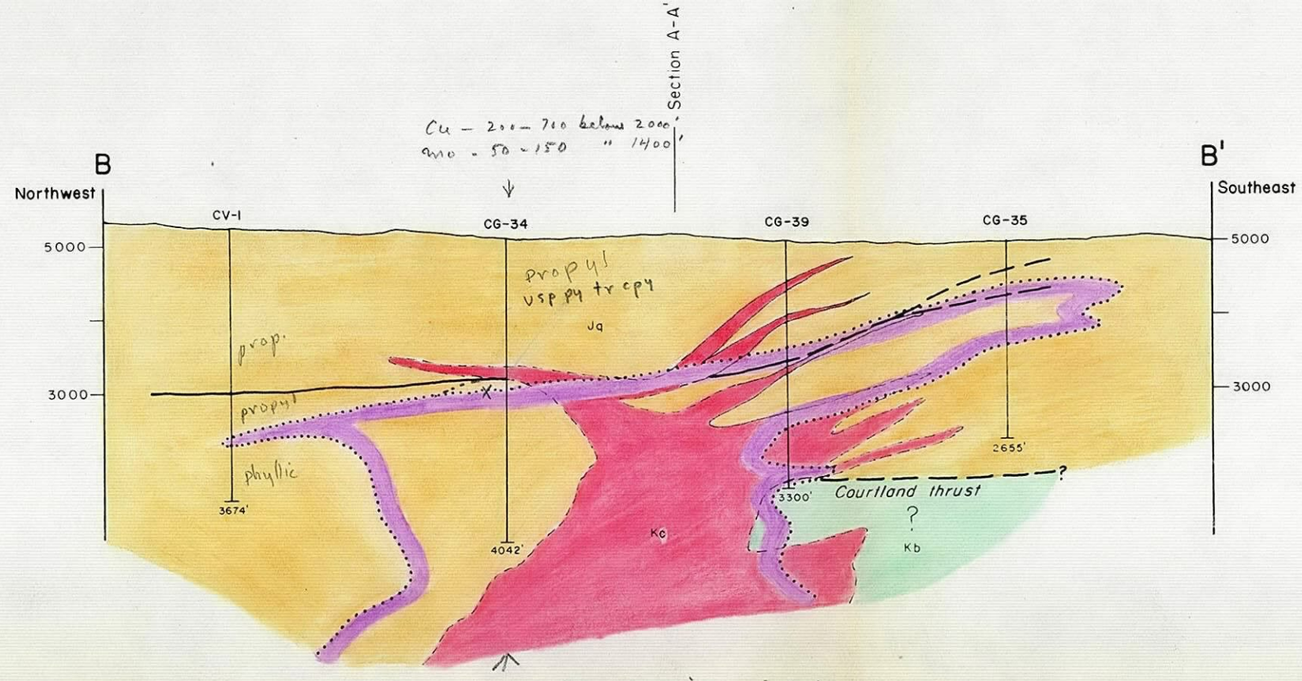
S. R. Davis

SRD:lb
Att.

cc: JDSell

Barrett Camp
(Site)
Side Hill Claim
Telles Ranch
COURTLAND THRUST
Turquoise Mtn
Hergesh Turquoise Mine
Courtland
Cem
DRAGOON FAULT
NEW SITE
Christensen Ranch
SJ-1
Maud Hill
Gleeson
Shafts
Tunnels
OLD RR GRADE
ROAD
GLEESON COURTLAND
Canyon
Windmill
BM 4923
BM 719
BM 712
4734
4657
4640
4585
4989
4902
4948
5082
5582
5000
5400
4600
4900
A
A'
B
B'





below flt - alt increases - incl qtz-py + cpy
but no apparent change in rock texture - or fabric - "porph"
fault appears post m - but probably only minor offset
alt increases below to pervasive phyllic

JHC 5-8-74

EXPLANATION

Kb	Bisbee group
Kc	Copper Belle
Jq	Gleeson quartz monzonite
	Paleozoic rocks; Bolsa-stippled, Limestones-lined
	Fault
	Limit of strong alteration

TO ACCOMPANY REPORT
DATED 2/6/74
BY F.T. GRAYBEAL - J.P. SELL

GEOLOGIC SECTIONS

COURTLAND-GLEESON DISTRIC

Cochise County, Arizona

Scale: 1" = 2000'

F.T.G. Feb. 1974

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

J. H. C.

June 20, 1974

AUG 5 1974

Memorandum for Record

Courtland-Gleeson
Cochise County, Arizona

Mr. Osborne called today to state that he and Mr. Collins had made the decision not to proceed with exploration at Courtland-Gleeson. Should the property become available on better work committment-land terms, they would again consider it.

Mr. Osborne requested I inform Bear Creek of their decision, which I have done by phone calls to Herm Bauer and Gordon Lister.

W. L. Kurtz Jr.
W. L. Kurtz

WLK:lb

cc: TCOsborne
JHCourtright

JHC

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

J. H. C.

AUG 5 1974

June 17, 1974

Mr. T. C. Osborne
Assistant Director of Exploration
New York Office

Request for Exploration Authorization
Courtland-Gleeson Project
Cochise County, Arizona

Dear Sir:

On February 20, 1974, I forwarded Messrs. Graybeal's and Sell's evaluation of subject district. At that time I did not recommend a joint venture agreement with Bear Creek Mining Company because of large yearly land payments. Bear Creek has renegotiated the options so that yearly land payments are at a minimum and I now recommend a joint venture exploration program. Mr. Courtright, in a file memorandum dated May 17, 1974, has recommended a drill test.

Terms discussed with Bear Creek call for a June 15, 1974 anniversary date and for Asarco to spend $1 million over four years to earn a 51% interest as follows:

Period	Committment	Cumulative
6 months	$ 80,000	$ 80,000
12 months	80,000	160,000
24 months	250,000	410,000
36 months	250,000	660,000
48 months	340,000	1,000,000

Of the above $1 million, land payments cannot make up more than 1/2 of the cumulative total.

After we have obtained our 51% interest, dilution will occur at the rate of 2% for each $100,000 expenditure and when dilution has reached 20% the non-operator's interest converts to 15% net profits after payback with a minimum $100,000 payment per year from date of beginning operation until payback.

Total maturing land payments are approximately $2.1 million due: $237,500 -- 9/1/76; $815,000 -- 9/28/77; and $1.1 million -- 3/27/78.

I estimate first six months expenditures necessary to complete work on the State prospecting permits, assessment work on claims, and $4,000 payment on the Shannon option at $20,000, and $80,000 to drill one exploration hole to be located between JL-4 and 32a. If you approve, please request an Exploration Authorization in the amount of $100,000. Forms 302-E and 302-EA are enclosed.

Respectfully submitted,

W. L. Kurtz

W. L. Kurtz

WLK:lb
Encs.: Land Map
Forms 302-A & 302-EA

cc: JHCourtright - w/encs.
RBCrist - w/o encs.
FTGraybeal - w/o encs.
ADCoumides - w/forms only

PRINTED IN USA. 9/69

FORM 302-E

New York No. .....

APPLICATION FOR EXPLORATION AUTHORIZATION

June 17, 19.74 Originating Office ....SWED - Tucson.....

DESCRIPTION:

LOCATION OF PROSPECT/PROJECT: T19S, R24-25E, Cochise County, Arizona, approximately

PARTNERS: BEAR CREEK MINING COMPANY

Partner's Per Cent ....49.....

COMPANY: [X] ASARCO

[ ] Subsidiary. Specify .....

WORK CONTEMPLATED:

Drill one diamond drill hole to a depth of 5,000 feet to test a proven large porphyry copper phyllic alteration zone.

Total estimated cost (FORM 302-EA ATTACHED) $100,000.....

Reviewed by .....
Acct. Mgr. or Chief Acct.

Approved by .....
Vice President

Recommended by W. L. Kurtz
Supervisor

Approved by .....
Comptroller

Account Chargeable to .....
To be designated by Comptroller

Approved by Advisory Committee

.....19 ...

Approved by Board of Directors

.....19 .....

.....
Secretary

PROSPECT COURTLAND-GLEESON

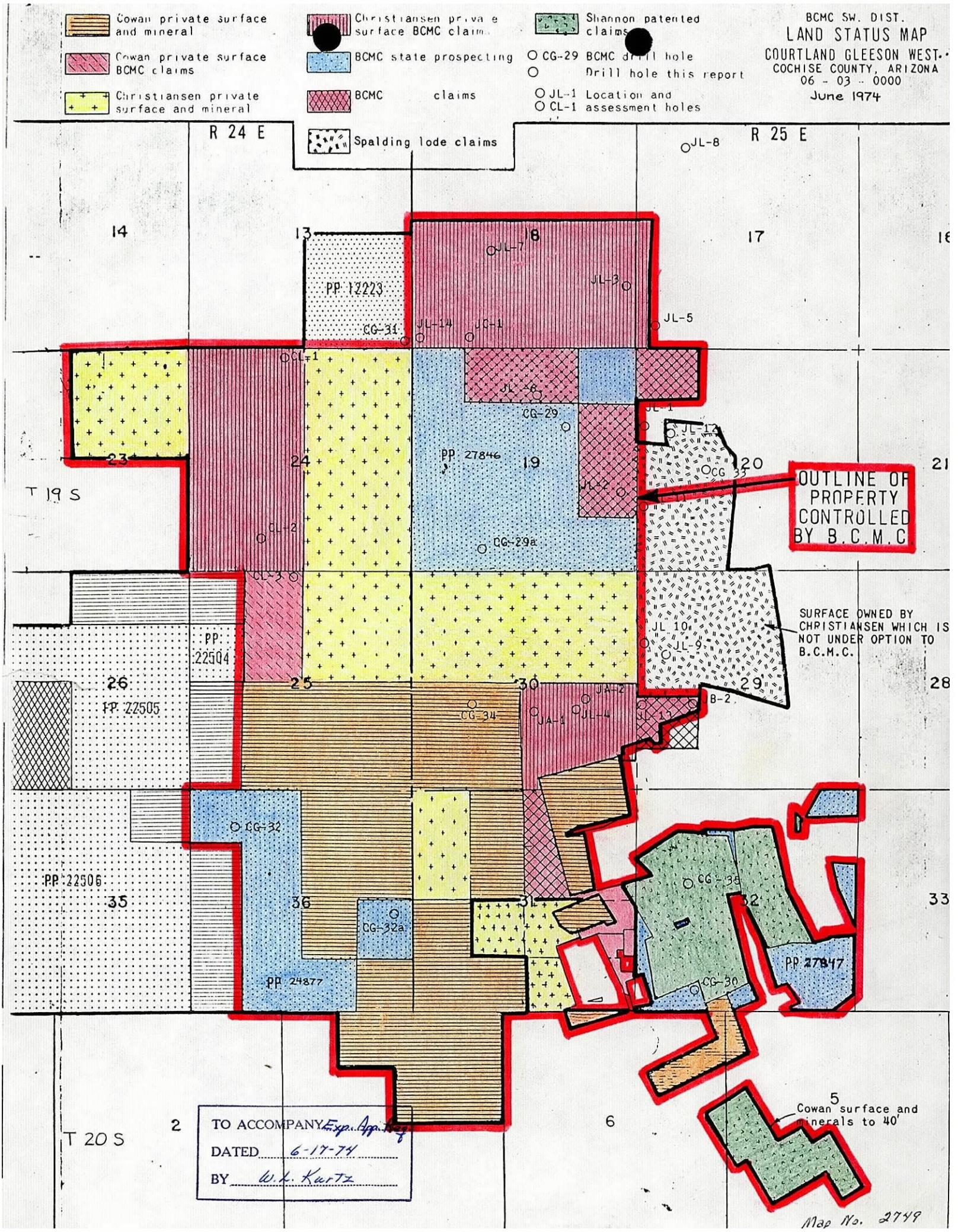
LOCATION Cochise County, Arizona

COST ESTIMATE, MINERAL EXPLORATION

OFFICE SWED - Tucson

W. L. Kurtz

No.	Type of Work	Salaries/Wages Days	Salaries/Wages Amount	Material	Fees, Rent, Services	Traveling	Taxes	Other	Total Estimate Cost
501	Outright Purchase								
502	Option Payments				4,000				4,000
503	Bonus Payments								
504	Minimum Royalties-								
	Deductible from								
	Future Production								
505	Minimum Royalties-Not								
	Deductible from								
	Future Production								
506	Rental Payments								
507	Staking Claims								
511	Surface Excavating								
512	Underground "								
521	Surface Drilling				86,000				86,000
522	Underground "								
530	Geologic								
540	Sampling, Assaying, Lab.				2,000				2,000
550	Geophysics								
560	Geochem								
570	Engineering								
580	Construction (temp.)								
590	Construction (perm.)								
610	Administration, Field		5,000			3,000			8,000
	Offices and Camps								
620	Administration, General								
641	Autos and Vehicles								
642	Aircraft and Boats								
650	Partner's Share								
	ASARCO'S SHARE		5,000		92,000	3,000			100,000
661	Commission or Fees								
663	Exchange								


Cowan private surface and mineral
Cowan private surface BCMC claims
Christiansen private surface and mineral
Christiansen private surface BCMC claims
BCMC state prospecting
BCMC claims
Spalding lode claims
Shannon patented claims
CG-29 BCMC drill hole
Drill hole this report
JL-1 Location and
CL-1 assessment holes
BCMC SW. DIST.
LAND STATUS MAP
COURTLAND GLEESON WEST
COCHISE COUNTY, ARIZONA
06 - 03 - 0000
June 1974
R 24 E
R 25 E
T 19 S
T 20 S
OUTLINE OF PROPERTY CONTROLLED BY B.C.M.C.
SURFACE OWNED BY CHRISTIANSEN WHICH IS NOT UNDER OPTION TO B.C.M.C.
Cowan surface and minerals to 40'
PP 12223
PP 27846
PP 22504
PP 22505
PP 22506
PP 24877
PP 27847
TO ACCOMPANY Exp. App. Req
DATED 6-17-74
BY W.L. Kurtz
Map No. 2749

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

May 17, 1974

MEMORANDUM FOR: FILE

COURTLAND-GLEASON
COCHISE COUNTY, ARIZONA

Reference is made to Mr. Kurtz's February 20 letter to Mr. Osborne on Bear Creeks' prospect with a report by Messrs. Graybeal and Sell.

Bear Creek has since renegotiated terms with the owners, deferring payments and providing a more reasonable deal whereby there is ample time to carry out exploration with relatively minor sums required for property obligations.

After examining drill core representing some of the key penetrations I can agree with critical interpretations of the report ---- that the major displacements on low angle faults are likely premineral in age and that a sizeable porphyry copper phyllic zone existing in the southwestern part of the area could be underlain by potassic alteration containing ore-grade primary copper mineralization.

The probable depth of such an occurrence is highly speculative. Since the top of the phyllic zone, as indicated by the 4 holes in the periphery of the "Projected Deep Target" (Plate 1 of the Report), is down around 2000 feet, the top of the potassic zone might well lie below 4000 or 5000 feet. But, due to the wide spacing of the holes, a somewhat lesser depth is at least possible. Although a rather high risk exploration gamble is involved, a major sized porphyry copper deposit could exist and a drill test of two holes ($250,000 cost, including claim assessment work) is warranted, I believe.

J. H. Courtright

J. H. Courtright

JHC:vmh

cc: J. J. Collins
W. L. Kurtz

Draft: F.T.Graybeal
May 16, 1974

COURTLAND GLEESON DRILL SCHEDULE

The outline of the present BCMC ground is shown in red on the uncolored sketch map. A small block in the Gleeson area (SE1/4 sec. 31) labeled Valdez contains 2 patented claims which Quintana was able to option during their work. Two other very small blocks of questionable or non-BCMC ownership occur adjacent to the Valdez block on the east, also, for the most part, in sec. 31.

The drill schedule is given on Table 1. The unpatented claim groups have been individually combined to form the largest contiguous group possible to reduce the number of separate drill or other work programs to a minimum. These groups, listed on Table 1, are shown on the colored sketch map and are labeled according to group number, total claims in the group, and the number of claims in the individual blocks included in each group. For the state leases I have circled the section number, which is given on Table 1, and written on the section the dollar value of the work committment.

Commenting individually on the notes on Table 1, I feel that unpatented claim groups 1, 2, 3, and 4, which lie in the northern part of the district could be dropped at an annual savings of $5600. I think BCMC would go along with this, particularly in the case of groups 2 and 3. The same thinking also applies to section 19 (a saving of $9600). A final decision would involve a careful review of all data in this area and might be postponed until after September 1, 1974, in which case the $5600 would have to be spent this coming summer. The state leases on sections 19 and 32 were dropped and reapplied for, so no work on them would be required in 1974. Because of the above, I have not spotted any drill holes on claim groups 1-4 or sections 19 and 32.

If work is to be done on the claim groups, it could be done anywhere due to the non-critical location of the ground and I believe all groups contain previously collared holes which could be deepened.

Claim group 5, which contains JL-4, includes 6 recently staked claims in the SE1/4 of section 31 and assessment work will not be required on them until after September 1, 1974. My notes indicate that JL-4 is "reenterable with trouble" and I recommend attempting to do so and, if successful, deepening the hole 1500 ft. from 3645-5145 ft. If this hole is not reenterable, I suggest collaring a new hole about 1500 ft. SW of JL-4 on claim group 5 and along the south side of section 30, and drilling it to 5000 ft. This will have to be started before Sept. 1, 1974.

The remaining work requirement in 1974 is the $2800 on section 36. I recommend this be done by deepening hole CG-32A 2000 ft. from 3038-5038 ft. This work will have to spend $2800 before Aug. 30, 1974.

In the Shannon area a decision must be made whether to purchase the ground by Sept. 1, 1976. To this end I recommend that upon completing CG-32a that CG-35 be deepened 1500 ft. from 2655-4155 ft. If the results are favorable, an additional hole could be collared 1500 ft. to the NE on the small wedge of state ground which could serve as the 1975 work requirement for section 32. If the results of deepening CG-35 are unfavorable, a decision to drop the Shannon ground should be made and would depend on the results of CG-32a and JL-4.

Drill scheduling is given on Table 2. I prefer to start with two diamond drills drilling simultaneously in CG-32a and JL-4. The alternative is to use the rotary (drill #3) which will drill only assessment requirements

on Groups 1-4 to drill $1400 on Group 5 then move drill #1 to JL-4. This is a waste of $1400, but may be necessary if 2 diamond drill rigs are not available. In addition, the use of 2 diamond drills will enable us to evaluate the Shannon mine area more rapidly.

I have not proposed any additional holes beyond CG-32a, 35, and JL-4, because upon completion of them a more accurate evaluation of further work can be made. If a Joy 22 is used, the cost of deepening the 3 holes a total of 5000 ft. would be approximately $19.00/ft., which includes some cleaning, or $95,000. If a new hole has to be collared rather than reentering JL-4, the total footage would be roughly 8500 ft. at about $17.00/ft., or $144,500. Adding in the rotary work for one year, the total is roughly $150,000. This figure does not include option payments on the Shannon ground, tax payments on the various patented claims in the area, 1975 assessment work on claim groups 1-4, or 1975 work requirements on state sections 19 and 32.

F. T. Graybeal

FTG:lb

TABLE: 1 WORK REQUIREMENTS

	by Sept. 1, 1974	by Sept. 1, 1975
Group 1 ($2300)	do minimum or drop	do minimum or drop
Group 2 ($2500)	"	"
Group 3 ($200)	"	"
Group 4 ($600)	"	"
Group 5 ($1400 in 1974, then $2000 thereafter)	deepen JL-4 1500' to 5145' or collar new hole on unpatented claims near south side sec. 36 and drill 5000'	
Section 19 ($9600)	none required	do minimum or drop
Section 32 ($2583)	none required	if results in #35 good, drill 2000' in wedge 1500' NE of CG-35, otherwise drop
Section 36 ($2800)	reenter #32a, deepen 2000' from 3038-5038'	
Shannon area	no work required	deepen CG-35 1500' from 2655-4155'

TABLE 2: DRILL SCHEDULES

Drill #1 (core)

A) July 15, 1974: reenter CG-32a and deepen 2000' from 3038-5038'
↓
Oct. 1, 1974

B) Oct. 1, 1974: reenter CG-35 and deepen 1500' from 2655-4155'
↓
Feb. 1, 1975

continue drilling depending on drill and other geological results

Drill #2 (core)

A) July 15, 1974: reenter JL-4 and deepen 1500' from 3645-5145'; alternative is collar new 5000' hole
↓
Oct. 1, 1974
↓
Feb. 1, 1975

Terminate

Drill #3 (rotary)

A) July 1, 1974: drill minimum footage on Groups 1-4
↓
Aug. 31, 1974

Terminate

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

J. H. C.

MAR 15 1974

February 20, 1974

Mr. T. C. Osborne
Asst. Director of Exploration
New York Office

commercial

Bear Creek Mining Company
Courtland-Gleeson District
Cochise County, Arizona

Dear Mr. Osborne:

Attached is a copy of Messrs. Graybeal's and Sell's evaluation of Bear Creek Mining Company's data on the Courtland-Gleeson District, Arizona. This is one of the few Arizona districts that have had appreciable copper, lead, and zinc production in which a porphyry copper deposit has not been discovered. The district contains widespread pervasive quartz-sericite-pyrite alteration both exposed and concealed and favorable geochemical and alteration patterns. ?

We believe the large amount of previous drilling has not eliminated the possibility of finding a deep (3-5,000') primary porphyry copper and the district represents a well-above-average exploration gamble. However, even with the large amount of previous drilling, to adequately explore such a large and structurally complex district, we need to be prepared for a several-year exploration program. ?

Land payments are most unfavorable -- approximately $50,000 per year with about a 2 million dollar price maturing in 1976 ($240,000), 1977 ($1,100,000), and 1978 ($750,000). Asarco would have to spend one million dollars to earn a 50% interest.

On the basis of the above land situation, I do not recommend a joint venture with Bear Creek. Perhaps at some future date the district may be acquired on better land terms.

Very truly yours,

W. L. Kurtz

W. L. Kurtz

WLK:lb
Attach.

cc: JHCourtright - w/attach.
JDSell - w/o attach.
FTGraybeal - w/o attach.

W. L. K.

FEB 13 1974

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

February 6, 1974

J. H. C.

MAY 9 1974

Report to: W. L. Kurtz

From: F. T. Graybeal
J. D. Sell

Evaluation of Bear Creek's
Courtland-Gleeson property,
Cochise County, Arizona

SUMMARY AND RECOMMENDATIONS

Sharp increase in alt-min below post min fault in CG 34

Bear Creek recently discovered a large zone of strong quartz-sericite-pyrite alteration with minor chalcopyrite and molybdenite which lies at depth beneath fresh surface rocks. They attempt to explain the concealed mineralization as a result of offset along post-mineral flat faults. However, our study of the core indicates that these faults are pre-mineral. - Agreed A reconstruction of lateral and vertical alteration-mineralization patterns suggests the presence of a center of mineralization which can be tested with a single 5000 ft. drill hole. Forthcoming option payments are steep, but are, we believe, justified by the large body of data available with which to guide further exploration and we recommend acquisition of the property.

INTRODUCTION

On January 8, 1974 we began an intensive review of information held by Bear Creek Mining Co. concerning the Courtland-Gleeson district, Arizona. This area is located about 16 miles east of Tombstone, as shown on Figure 1. The maps and sections presented below are somewhat simplified from the detailed work by Bear Creek to show only the important aspects of the district.

In the period 1960-1962 Bear Creek drilled 28 holes to depths of up to 1000 ft. looking for a chalcocite blanket in the northeast part of the district. In 1967 they reinterpreted the geology using a San Manuel-Kalamazoo model and drilled several 2000 ft. holes. Since 1969 they have drilled 9 holes at depths of from 2500-4000 ft. to test a deep induced polarization anomaly in the southwest part of the district. Although this most recent work failed to locate ore grade mineralization, it did indicate the presence of a large zone of quartz-sericite-pyrite beneath fresh rocks and below what they interpreted as a flat fault. Locally anomalous amounts of Cu, Mo, Pb, and Zn occur within this zone.

In 1973 Quintana Minerals drilled 3 holes 3500 ft. west of the Bear Creek drilling, presumably looking for the root of the mineralization exposed farther to the east. They also accepted Bear Creek's flat fault

theories. The Quintana results indicate that alteration was generally weak to depths of 3500 ft. and may limit the quartz-sericite-pyrite zone on the west.

To date these drilling programs have not found ore grade rock. Our review cast considerable doubt on the Bear Creek and Quintana structural interpretations and indicated that the deep porphyry copper potential of the district was not yet sufficiently tested.

LAND STATUS

The location of land owned or controlled by Bear Creek is shown on Plate 1. The details of ownership, including option and rental payments and work requirements, are shown on Table 1. Of greatest importance are the option payments to Christiansen, Cowan, and Spaulding which total roughly $50,000 and of which about $40,000 will be due by the end of March 1974.

Although some of the lands listed on Table 1 could be dropped, the three options listed above are critical to further exploration in the district and would have to be retained.

Our assessment of the present situation in Bear Creek indicates that a considerable amount of this ground may be dropped if a partner is not found. We were informed that several other companies are reviewing the data; however, the large amount of dust on the core boxes suggested their reviews are not yet serious. The recent hiring of D. Snyder, formerly Bear Creek's district manager, by Kerr-McGee could advance the latter to a position of a serious competitor for the property. No, Dave's not bidding

GEOLOGY

The geology of the Courtland-Gleeson area is complicated by extensive flat faulting. Upper plate rocks consisting of Jurassic Gleeson quartz monzonite, Jurassic-Cretaceous Copper Belle dacite-latite porphyry, and Paleozoic sedimentary rocks have been moved eastward(?) over Cretaceous Bisbee group sedimentary rocks along the Courtland thrust. This thrust, exposed in the northeastern part of the district (shown on Plate 1), has been cut by several drill holes and appears to dip westerly at a very shallow angle (see AA', Plate 2). Bear Creek has interpreted the Courtland thrust as a post-mineral structure which has offset the mineralized limestones in the eastern part of the district from the root, thought to lie at depth to the west or southwest.

The Copper Belle rocks, which are exposed at the surface mostly east of the Dragoon fault as an irregular area of dikes, sills, and stocks, are thought to be the genetic source of the mineralization. Hole CG-11 which is located about one-half mile east of CG-23 and about 2300 ft. southeast

of section AA' penetrated 1201 ft. of Copper Belle. However, other data suggest rather strongly that the Courtland thrust is about 700 ft. deep in this area, indicating that the Copper Belle rocks may cut the thrust. Thus, the Courtland thrust may have controlled the emplacement of the Copper Belle rocks and subsequent mineralization.

ALTERATION-MINERALIZATION

The surface extent of strong alteration and mineralization is shown on Plate 1. This zone appears to dip westerly at a shallow angle, as shown on sections AA' and BB' on Plate 2, and post-mineral normal offset along the steep-dipping Dragoon fault appears likely. The thickest zone of strong alteration, projected to the surface, is shown on Plate 1, and it centers on holes CG-32A, 34, 38, 39, and JL-4. This zone also contains small amounts of chalcopyrite and molybdenite. We examined detailed skeleton core from these and other holes (1 sample every 2 ft.) and are completely convinced that the transition from fresh rock at the surface through propylitic to strong phyllic alteration at depth is entirely gradational. Attempts by Quintana and Bear Creek to separate fresh surface rocks from strongly altered rocks at depth with one or more flat faults are obviously incorrect.

We interpret the Courtland thrust as pre-mineral, although this structure may exist at considerable depth west of the Dragoon fault, possibly cutting off the mineralization. However, we have noted both from drill logs and examination of the core that the intensity of alteration and mineralization in the Bisbee group rocks below the Courtland thrust increases in a westerly direction. Also, Copper Belle rocks, which are in contact with the Bisbee group in several places, show no shearing as the contact is approached which may suggest emplacement along a pre-existing fault plane. These observations suggest the presence of a mineralized core in the footwall of the Courtland thrust in the general area between holes CG-29a, 32a, and 39 which is coincident with the area of strong mineralization cut by these same holes. The highest Cu, Mo, and sulfide contents (as determined by sulfur assay) in this area are encountered in holes CG-29a, 32a, 34, 38, and JL-4.

RECOMMENDATIONS FOR FURTHER EXPLORATION

The area which we feel is most favorable for further exploration is shown on Plate 1. It is centered over the southern portion of the concealed deep altered zone in an area of abundant concealed Copper Belle rocks. In addition, the bottom 500 ft. of holes CG-32a and 34 show a considerably greater abundance of pyrite veins as compared to all other holes. Testing of this target could be accomplished with a single 5000 ft. drill hole. Favorable aspects of this target area and of the district in general are:

True, but

1) a large zone of exposed and concealed quartz-sericite-pyrite

2) a recognizable center of coincident strong alteration, mineralization, and geochemical values (weak)

3) alteration zoning which is coincident with accepted models

4) a new working hypothesis involving thrust fault control of the mineralization, and

5) a past copper production exceeding that of the Pima, Silver Bell, and San Manuel districts prior to discovery of porphyry ores.

Unfavorable aspects of the target area are:

1) depth to postulated ore zone is 3000-5000 ft.

2) considerable uncertainty in the interpretation of the structural history of the district

3) forthcoming option-rental payments.

Several alternative target areas were also considered. The Shannon mine area (just east of Gleeson) may have a potential for replacement mineralization in the favorable Abrigo formation at depth, but the size of this zone appears limited by large masses of Copper Belle rocks. A second alternative is to deepen CG-6 to test for the continuity of surface mineralization below the Courtland thrust. This alternative interprets the exposed alteration and mineralization as the top of a dome-like zone which expands rapidly with depth, at least to the west. Also, a target in this area would possibly be less deep than under the concealed mineralization to the west. However, the presence of fresh Bisbee group rocks in CG-23 suggests that alteration below the Courtland thrust is not pervasive in this area. Further evaluation of these alternatives would be made if the property is acquired.

We currently feel that the large amount of drilling presently favors the target shown on Plate 1. Although the land payments are expensive, we believe they are more than offset by the large body of data available and we recommend acquisition of the property.

F. T. Graybeal

F. T. Graybeal

J. D. Sell

J. D. Sell

FTG/JDS:lb

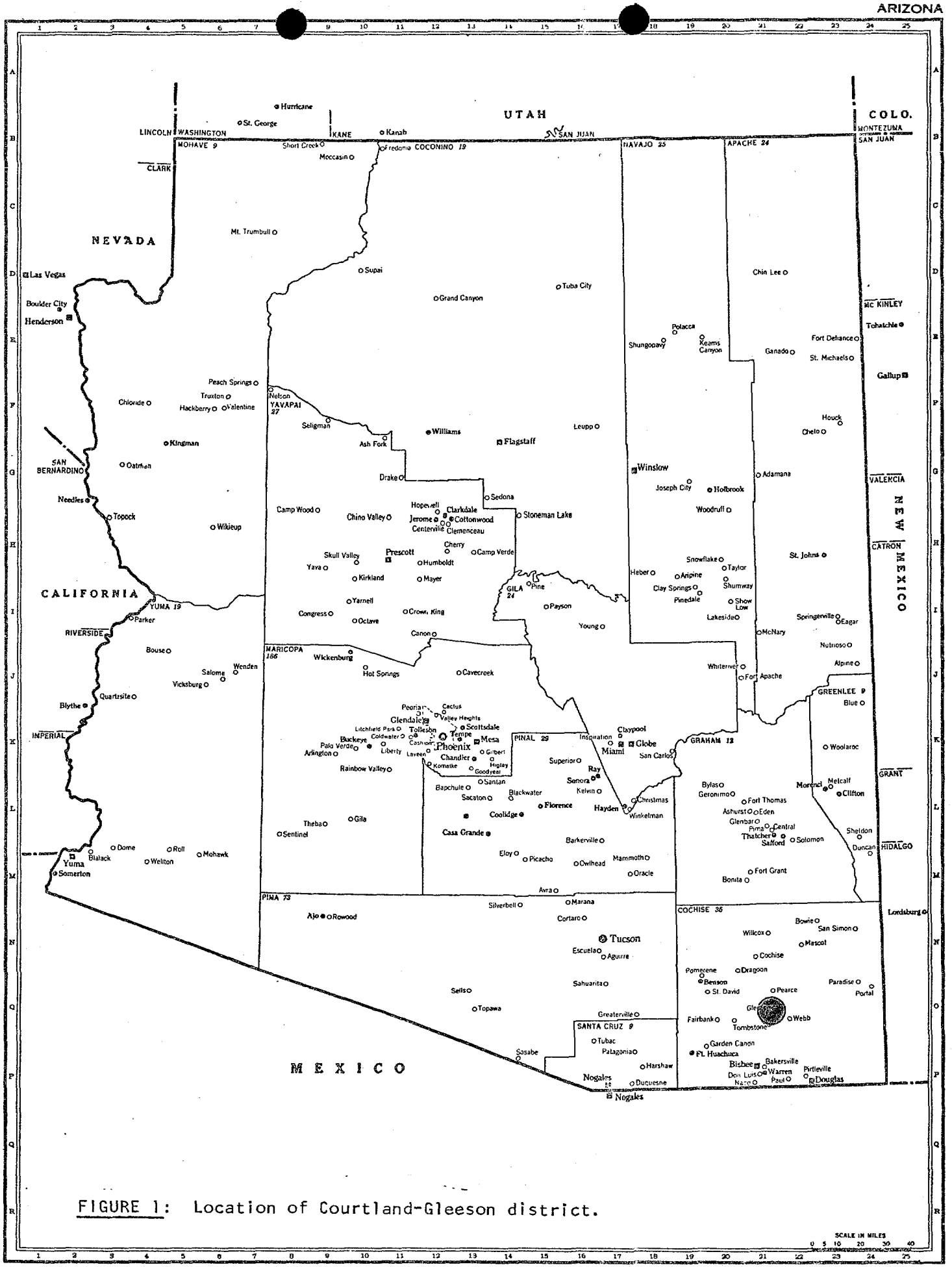


FIGURE 1: Location of Courtland-Gleeson district.

COURTLAND-GLEESON EXAMINATION
COCHISE COUNTY, ARIZONA
OPTION PAYMENTS AND WORK REQUIREMENTS FOR 1974

Landowner or Optionor & Type of Agreement	Claims or Acreage Held by BCMC	Acquired	Expires	Option or Rental Payments Date Due	Option or Rental Payments Amount	Work Requirement Type	Work Requirement Cost	Remarks
State Prospecting Permits								
20170	480 19 T19S R25E	4/22/71	4/22/76	4/22/74	$480.00	Assessment	$ 9,600	
20171	129.15 32 T19S R25E	4/22/71	4/22/76	4/22/74	129.15	Assessment	2,583	
22504	40 25 T19S R24E	2/13/73	2/12/78	--	--	Assessment	400	Will Drop
22505	320 26 T19S R24E	2/13/73	2/12/78	--	--	Assessment	3,200	Will Drop
22506	600 35 T19S R24E	2/13/73	2/12/78	--	--	Assessment	6,000	Will Drop
23672	160 13 T19S R24E	5/22/73	5/21/78	--	--	Assessment	1,600	
24877	280 36 T19S R24E	8/31/73	8/30/78	--	--	Assessment	2,800	
Bear Creek Claims	72 unpat lode claims	1968-71	--	--	--	Assessment	7,200	
Roy Christiansen et al Option Agreement	1,648 acres	3/27/70	3/27/78	3/27/74	21,000.		Balance due '78 $748,500	
Robert Earl Cowan Option Agreement	1,379.66 acres	9/28/72	9/28/77	3/28/74 9/28/74	10,000 10,000	--	Balance due '77 $708,000	
Robert Earl Cowan Option Agreement Dropped	440 acres	1/15/73	1/15/78	1/15/74 7/15/74	1,350 1,350	--	--	Will Drop
Shannon Mining Co. Option Agreement	Patented claims 369.893 acres	9/1/71	9/1/76	9/1/74	4,000	--	Balance due '76 $237,500	
Carlton Spalding et al. Option Agreement	22 unpat lode claims	4/28/72	4/28/77	4/14/74	10,000	Assessment	Balance due '77 2,200 $390,[illegible]	
				Totals	$58,309.15		$35,583	
				Totals not including lands to be dropped	$55,639.15		$25,983	