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M E M O

TO: Ron Short, Carole O'Brien, Anthony Budge
cc: John McKenney, Dale Allen

FROM: Don White, Robert Hodder

DATE: October 11, 1988

SUBJECT: Possibility of gold accidentally leaching from U.V.X. stockpiles

U.V.X. development ore is now being stockpiled on the ground within the mine yard. No plans have been consummated to get it on its way to a smelter. This is cause for concern because continued exposure to the weather may well diminish the precious metal content of the ore piles.

We are now fairly certain that the supergene role in concentrating precious metals at U.V.X. was quite profound. That is, meteoric waters channelled via the Verde Fault played an important part in transporting the metals to their present settings. The silica grit host is very porous and permeable. There is every reason to believe that merely wetting that material could redisolve some of the gold and silver and carry it away as runoff or into the ground beneath the piles.

We recommend against keeping stockpiles through a winter or even exposed to the January rains for risk that the grades will no longer match those of drilling, rib sampling, or car sampling. The best solution to the problem is to minimize holding time and get it to the smelters promptly. Failing that, or as a stopgap in bad weather, piles may be able to be covered with polyethylene sheets weighed down at their edges.

DW:sk

Dale

Michael Foster

PRECIOUS METALS WITH A VOLCANOGENIC BASE METAL DEPOSIT: THE UNITED VERDE EXTENSION MINE, JEROME, ARIZONA

by
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Presented at the 94th Annual
Northwest Mining Association Convention
Spokane, Washington
November 30, 1988

PRECIOUS METALS WITH A VOLCANOGENIC BASE METAL DEPOSIT: THE UNITED VERDE EXTENSION MINE, JEROME, ARIZONA

by Don C. White and Robert W. Hodder
A paper presented at the 1988 N.W.M.C.

ABSTRACT

From 1915 to 1938 the UVX produced 3.9 million tons of 10.2% Cu, 0.04 oz/t Au, and 1.7 oz/t Ag. This production came from three distinct types of ore bodies: i) About 3.0 million tons averaging 12% Cu, .03 oz/t Au, and 1.2 oz/t Ag. This occurred in the main orebody and a couple satellitic bodies, each massive chalcocite/cuprite grading downward into chalcopyrite/pyrite and ultimately near barren pyrite. The main orebody occurs above a quartz eye rhyolite traversed by a stockwork of chalcopyrite veinlets flanked by dense black chlorite. The copper mineralization is overlain by chert, volcaniclastic rocks, and basalt flows. The nature of this base metal occurrence is the principal evidence for a volcanogenic origin. ii) 850,000 tons averaging 6% Cu as chalcocite, malachite and azurite, 0.06 oz/t Au and 3.5 oz/t Ag from lens-shaped breccia zones which averaged 55% silica, were very iron oxide rich and appear to be silicified volcanic rocks off the margin of the main chalcocite orebody. iii) 35,000 tons of fine grained, brecciated and iron-oxide bearing material which averaged 90% silica, 0.40 oz/t Au and 2.0 oz/t Ag. This material is also peripheral to the main orebody and adjacent to top and bottom margins of a diorite sill which intrudes the volcaniclastic succession overlying and flanking the chalcocite body. The diorite has a core of chlorite, epidote and calcite pseudomorphing primary minerals, a middle zone which is essentially an argillic assemblage and an edge that is extremely siliceous and which fades into a siliceous hornfelsic-textured equivalent of the hosting volcaniclastic rocks.

The interpretation is that the chalcocite body is a supergene enriched pyritic lense of syngenetic origin above a focused discharge site for hydrothermal fluids, probably sea water convected by the heat of a rhyolite dome. The siliceous gold ore lenses at the margin of the diorite sill are viewed as primary gold concentration in chert off the edge of the rhyolite dome, locally reworked, silicified, and reconstituted into higher grade pods by alteration of the diorite sill at its time of emplacement. This alteration was essentially an exchange of water into the sill and silica into the possibly still wet volcaniclastic rocks. A third reconstitution and upgrading took place after lithification, uplift, fracturing along linear faults and downward percolation of ground water, which redistributed silica, copper, iron, and precious metals into the now most auriferous zones adjacent to the diorite sill but notably within 300 feet of the Precambrian-Paleozoic unconformity. The silica-copper ore bodies are interpreted as mainly supergene concentrations of quartz and secondary copper minerals in broken volcanic rocks adjacent to the steep regional Verde Fault. This copper and appreciable precious metal was carried downhill from the major United Verde orebody which is uphill and across the regional fault from the United Verde Extension. The supergene process is still active and can be observed in the stream course which bisects both deposits and the fault.

INTRODUCTION

Copper was the principal product through the first half of this century at Jerome in Yavapai County, central Arizona. This came from two large and several small massive sulfide bodies stratabound within steeply dipping Proterozoic volcanic rocks successively overlain by flat lying Paleozoic sandstone and limestone and Tertiary conglomerate and basalt (Anderson and Creasy, 1958). The first found, and largest of these deposits was the United Verde which outcropped and produced 33 million short tons at 4.8% Cu, .043 oz/t Au and 1.5 oz/t Ag from massive and stringer chalcopyrite in the footwall of a pyritic lense perched upon a chlorite pipe penetrating a rhyolite footwall and overlain by chert, tuffs, and basalt (figure 1 and table 1). The second largest orebody was the United Verde Extension (UVX) which did not outcrop but was found by underground exploration on the downthrown side of the Verde Fault which bisects the area. The United Verde Extension produced 3.9 million short tons averaging 10.2% Cu, 0.039 oz/t Au, and 1.7 oz/t Ag, mostly from a lense of chalcocite above a chalcopyrite stringer zone within rhyolite and overlain by chert and tuff. Initially these massive sulfide bodies were interpreted as sulfide replacement of schistose rock and the United Verde Extension was believe to be the downfaulted, supergene enriched, top of the United Verde. Subsequently Paul Handverger's and Paul Lindberg's (1974) mapping convinced most that the two ore bodies are independent, each above their own hydrothermal roots which flair out upon a common exhalative stratigraphic horizon now folded into the Jerome Anticline and separated by over 2,000 feet of normal displacement on the Verde Fault (figure 2).

In 1980, Paul Handeverger, vice-president of Verde Exploration, Ltd., had the presence of mind to assay for gold in ferruginous cherty specimens from the company's classic rock collection taken from mine workings inaccessible since the 1930's. These rocks were originally mapped as gossan above the supergene copper deposit (figure 2). It was Handverger's contention that this might be auriferous chert peripheral to a volcanogenic base metal massive sulfide deposit and an attractive target of gold-bearing silica flux rock much in demand by Arizona's copper smelters. A. F. Budge (Mining) Limited has drilled this target from rehabilitated mine workings (figure 3) concurrently with compilation of past production records. This work has defined three ore types on the basis of metals, gangue minerals, and location, and supports a reinterpretation of distribution of precious metals at the United Verde Extension.

CHALCOCITE-CUPRITE ORE

The main ore body which sustained production at the UVX was an equi-dimensional lense of massive chalcocite and cuprite of approximately 3 million tons at 12% Cu, 0.03 oz/t Au and 1.2 oz/t Ag, which extended from 400 to 800 feet below the Precambrian-Paleozoic unconformity to diminishing amount of chalcopyrite and pyrite in stringers within chloritic schist persisting downward an additional 250 feet. It has a footwall of rhyolite against the Verde Fault and a hanging wall of chert and tuffs.

COPPER-SILICA ORE

Copper-silica ore was mined from more than 20 separate bodies aggregating about 850,000 tons of 6% Cu, 0.06 oz/t Au, 3.5 oz/t Ag, plus 55% SiO_2 and 12% Fe. Gold abundance was extremely variable from stope to stope and body to body over a range of 0.02 oz/t to 1 oz/t (tables 2 and 3). These ore bodies are between 100 and 400 feet below the Precambrian-Paloezoic unconformity in immediate hanging wall strands of the Verde Fault (figure 4). Malachite, azurite, chalcocite, and minor cuprite and native copper occur with up to 25% hematite and goethite along fractures in shattered, massive, fine grained quartz. The hematite varies from blood red to brown in color and earthy and porous to massive and flinty. Some hematite is specular.

GOLD-ONLY ORE

Gold-only ore was discovered in the 1920's when an exploration cross-cut intersected a fine grained, gritty quartz interval which "flowed like sand" and contained more than 1 oz/t Au. This material was more than 90% SiO_2 and virtually devoid of alumina and alkalis. It was mined for flux and shipped direct to the smelter at the rate of one car of gold-only ore to three cars of massive chalcocite. Most of the gold-only ore came from one stope, the Gold Stope (figures 3, 4, and 5) of 35,000 tons averaging 0.4 oz/t Au and 2.0 oz/t Ag with less than 1000 ppm combined base metals but with appreciable As, Bi, Hg, Mo, Sb, Se, Sn, and Te. Except for Sn as cassiterite, none of these trace metals has been identified in mineral species. Gold occurs in micron-size grains of native metal and electrum.

The Gold Stope, and additional gold-only ore bodies found by recent exploration, are farther into the siliceous hanging wall of the Verde Fault and stratigraphically above copper-silica ore. They are in the first 300 vertical feet below the Precambrian-Paleozoic unconformity, and within wrinkles on foot and hanging wall of a diorite sill which is roughly conformable to the Verde Fault and to hanging wall tuffs and cherts. The ore bodies are shattered lenses with several generations of hairline to millimeter thick fractures healed by quartz and yellow to brown geothite and hematite which contain in some instances discordant pipe-like zones of matrix-supported breccia in which clasts are inches to several feet in diameter of finely fractured, equigranular, fine grained quartz. Clasts are angular to round and both clasts and matrix are traversed by nearly horizontal liesegang bands of variously colored iron oxides. Fractures and bands fade outward from the hanging wall of the Gold Stope into doubly graded chert breccias. The footwall of the Gold Stope grades into a massive siliceous hematite-rich rock and progressively into a beige delicately banded to massive and siliceous margin to the diorite sill. This so-called beige-banded silica is the hornfelsed margin which occurs everywhere concentric to the diorite sill.

THE DIORITE SILL

The diorite sill has an average thickness of 250 feet and extends from above the massive chalcocite-cuprite body for 2,000 feet to the northwest beneath the Precambrian-Paleozoic unconformity (figure 3). It has a core with a sub-ophitic texture of chlorite, epidote, and calcite

pseudomorphing plagioclase and hornblende. This propylitic assemblage at the core of the sill grades outward to both hanging and footwall zones dominated by clay minerals. There is abundant hematite and occasional native copper along fractures. The argillic zone grades outward to an intensely silicified and kaolinized margin. Beyond are the earlier volcanics, generally cherts, which are hornfelsed for several feet adjacent to the diorite.

INTERPRETATION

In brief, the United Verde Extension ore body is steeply inclined and from bottom up is veinlets of chalcopyrite and pyrite in black chlorite overlain by a lense of massive chalcocite after pyrite and succeeded upward by extremely siliceous, iron-rich, broken rocks adjacent to the Verde Fault and in hanging and footwall of a diorite sill. This siliceous, iron-rich rock contains copper-silica bodies with 0.06 oz/t Au and 3.5 oz/t Ag and gold-only bodies with an average of 0.17 oz/t Au and 3.8 oz/t Ag which are close to the diorite sill and the unconformity between Precambrian and Paleozoic.

Lindberg's (1974) interpretation of base metal massive sulfide distribution does not consider gold except as a primary trace metal of volcanogenic base metal massive sulfide deposits with some supergene enrichment in the UVX. In his interpretation the siliceous, iron-rich zone is an in situ gossan immediately below the unconformity and immediately above the supergene massive chalcocite-cuprite body.

However, it is our contention that the hypogene and supergene processes must be somewhat more complex to explain the total metal content and its distribution relative to the diorite sill. We interpret the following events: 1) the diorite sill intruded into still hydrous exhalative cherts and cherty tuffs overlying and flanking the primary sulfide deposit of the UVX.

2) during emplacement and cooling the diorite was hydrated by water from the cherts and tuffs to propylitic and argillic mineral assemblages by an exchange of water for silica. The bulk of expelled silica is now the beige-banded siliceous halo to the diorite, and the siliceous, repeatedly fractured cherts and tuffs marginal to the sill.

3) intake of cold water into the sill was diffuse but discharge of warm water bearing iron, gold, and other metallic elements was focused at step-like wrinkles in the sill margins and into coincident disrupted zones within flanking cherts and tuffs. This fluid flow affected the first upgrading of iron and precious metals and other attendant trace elements at epithermal-like sites.

4) with erosion following Tertiary normal movement on the Verde Fault, the United Verde massive sulfide deposit was exposed. Meteoric water running down the fault scarp and into the fault zone progressively enriched the copper deposit of the UVX in place but also selectively leached precious metals, copper, silica, and iron from the United Verde and redeposited them in the Verde Fault zone in the first few hundred feet below the unconformity.

There is no convincing pseudomorphous evidence that the siliceous and iron-rich area was ever sulfide-bearing or particularly metalliferous. In addition, the present course of Bitter Creek is through the United Verde to the UVX and during the rainy season has running water which is milky with silica gel and assayable iron, copper, and gold. This is depositing as ferricrete just down stream from the UVX and as copper oxides on fractures in Tertiary basalt.

CONCLUSIONS

The primary gold content of the base metal massive sulfide deposits at the United Verde and UVX is average for this type of deposit. The elevated gold content at the UVX is by secondary hypogene concentration in peripheral cherts during early mafic sill emplacement in the Precambrian and, by transported supergene enrichment from Tertiary to present.

ACKNOWLEDGEMENTS

The authors thank A. F. Budge (Mining) Ltd., lessee of the UVX, for whom much of the data herein was acquired, for permission to present this paper. Verde Exploration Ltd., the UVX owner, also provided support through access to its historical data on the UVX and by permission to share same.

Two excellent theses at the University of Western Ontario have advanced understanding of the effects of the diorite and the petrology of the silica body. They were done by Steve Harding (1986) and Iain Sloan (1987) respectively.

Other laboratory support is much appreciated from Tom Nash (petrographic study - USGS, Denver), Holly Huyck and Tiebing Lieu (XRD and SEM work, University of Cincinnati, Ohio) and Peter McLean (petrographic study of the gold-only ores, University of Western Ontario, London, Ontario).

	U.V.	U.V.X.
Production (millions short tons)	33.0	3.9
%Cu	4.8	10.2
oz/t Au	0.043	0.039
oz/t Ag	1.6	1.7

Table 1: Production from the United Verde and United Verde Extension Mines

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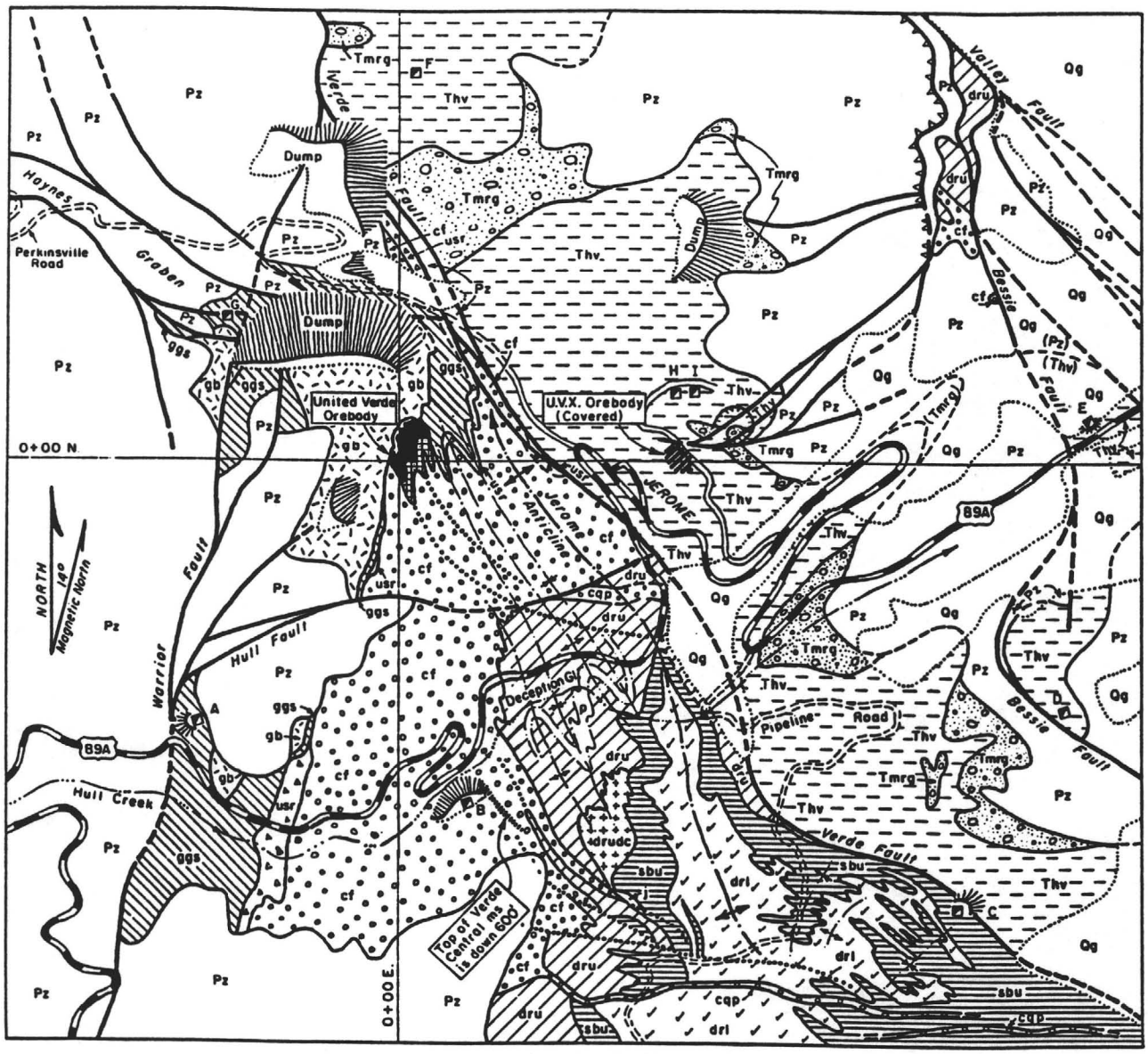


Simplified geologic map of the Jerome area, Verde district, Yavapai County, Arizona (modified from Lindberg, 1986). Post-1971 detailed contact mapping modifies the interpretations and nomenclature of Anderson and Creasey (1958) and Anderson and Nash (1972). Current informal district usage is given below.

MAP SYMBOLS:

- Shafts: A=Jerome Grande, B=Verde Central, C=Verde Combination, D=Gadsden, E=Texas, F=A&A, G=Haynes, H=Edith & I=Audrey
- F_1 Folds (NNW) & F_2 "Cross Folds"
- Proterozoic Cauldron Faults
- Tertiary Faults; Laramide/Miocene

PHANEROZOIC ROCKS:

- Qg Quaternary Alluvium
- Thv Miocene Hickey Basalt
- Tmrg Pre-Miocene Conglomerates
- Pz Paleozoic Sediments; Undiff.

PROTEROZOIC ROCKS:

- gb Synvolcanic Intrusive Gabbro Sill
- ggs Grapevine Gulch Fm; Volcaniclastic Sediments, Tuffs
- usr Upper Succession Rhyolite/Dacite Domes & Breccias
- ms United Verde & U.V.X. (Concealed) Massive Sulfides
- bs Mg-Chlorite Alteration Zone ("Black Schist")
- cf Cleopatra Formation; Undiff. Rhyodacitic Extrusive
- cqp Cleopatra Quartz Porphyry Dikes
- ms Verde Central Massive Sulfide Horizon
- dru "Upper Deception Rhyolite" with Polygonal Flow (p)
- drudc Dacitic Dome within "Upper Deception Rhyolite"
- sbu "Upper Shea Basalt"; Includes Minor Rhyolitic Strata
- drl "Lower Deception Rhyolite" Flows & Breccias

FIGURE 1 - JEROME AREA GEOLOGY; from Lindberg and Gustin, 1987.

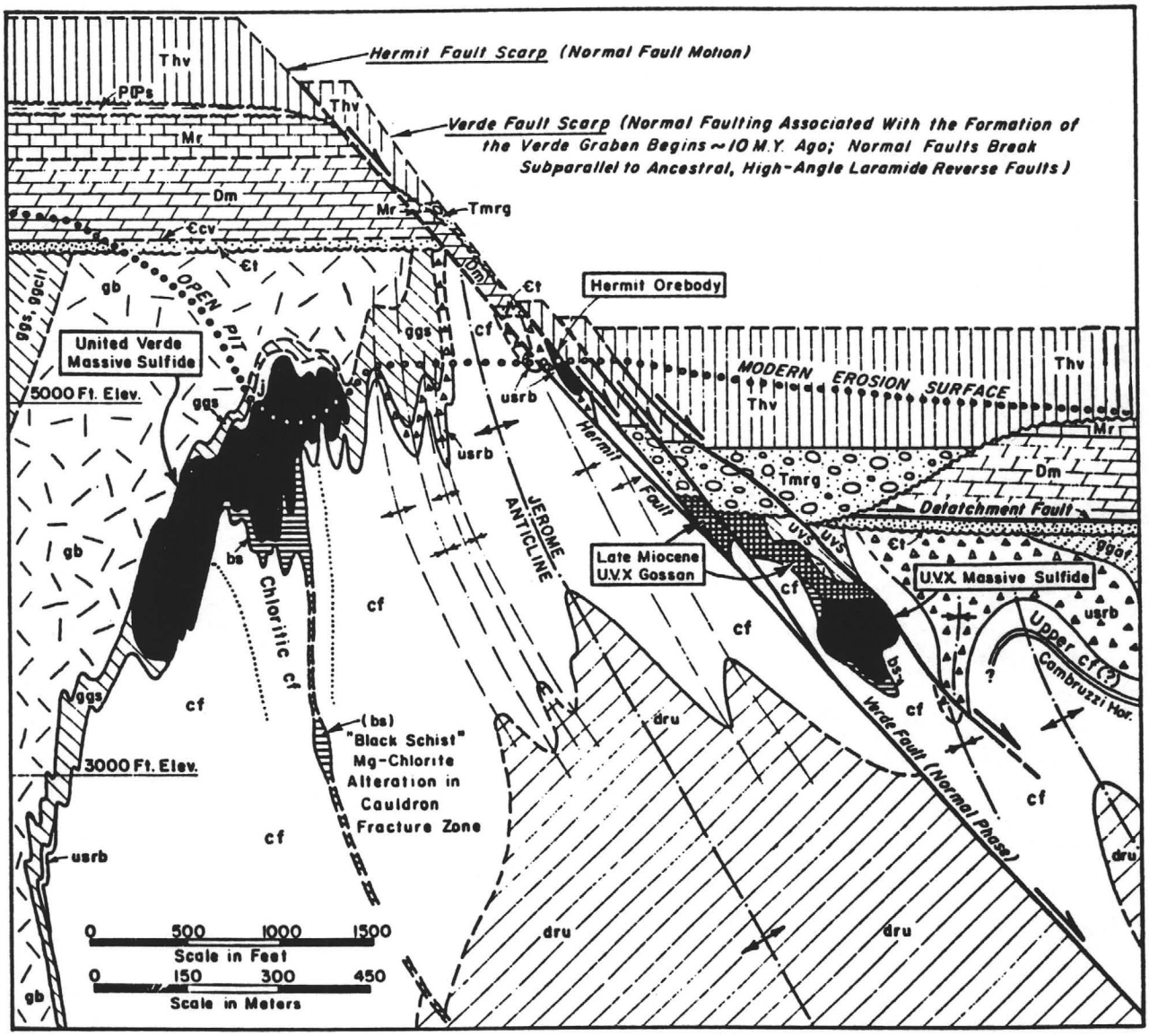


FIGURE 2 - EAST-WEST CROSS SECTION, LOOKING NORTH, THROUGH THE JEROME ANTICLINORIUM; from Lindberg and Gustin, 1987. Geologic notations are given in figure 1. The time is about 10 Ma when normal Verde graben faulting began. Note the UVX "Gossan" which is reinterpreted herein as primary chert, metasomatic silica, and supergene silica. It hosts the "copper-silica" and "gold-only" ores. The "uvs" unit adjacent to the gossan is actually the argillic-altered diorite sill.

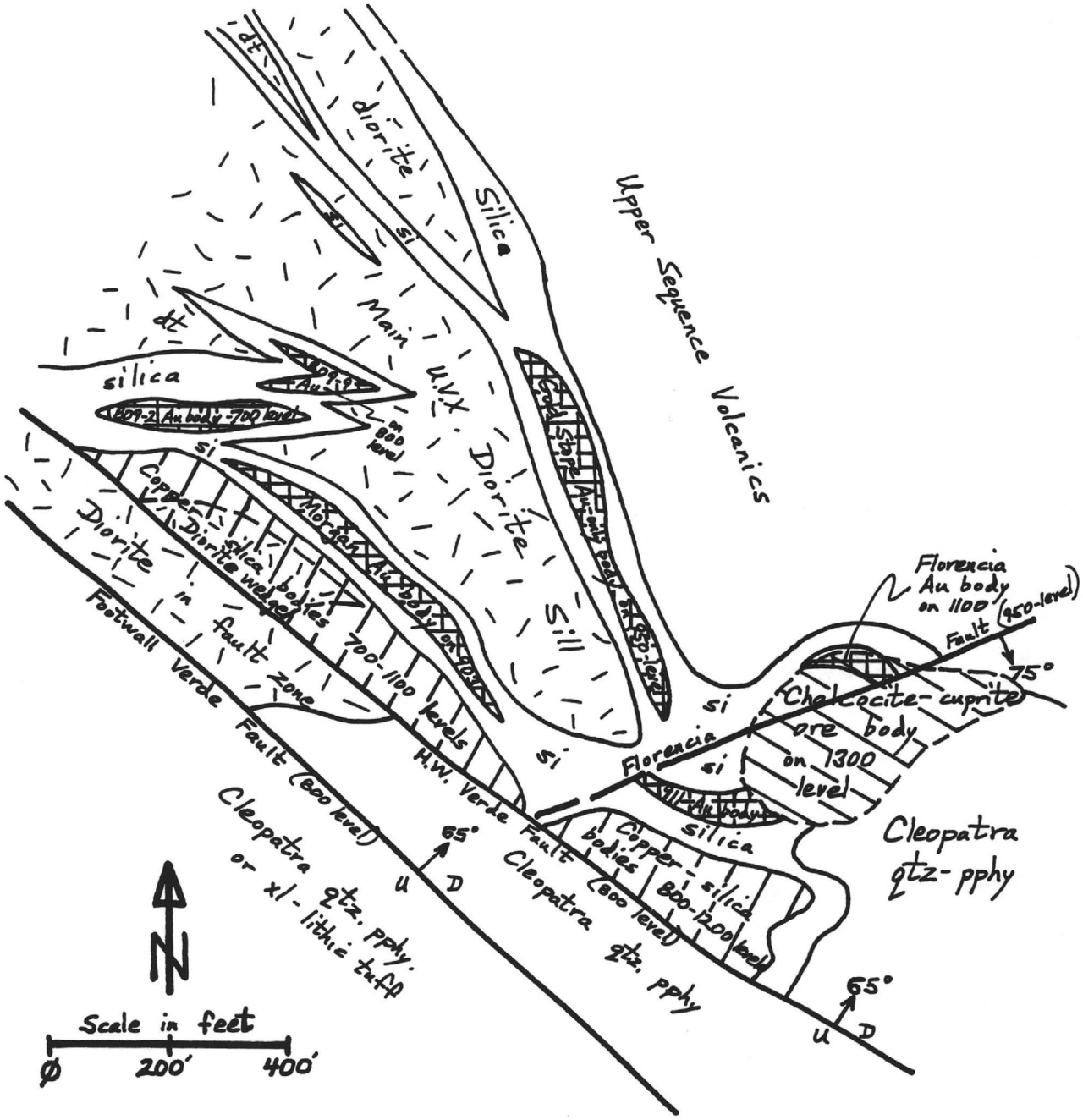


Figure 3 - U.V.X. Composit Plan

Showing three main ore types (chalcocite-cuprite, copper-silica, and gold-only) with respect to major structures, silica, and the diorite sill.

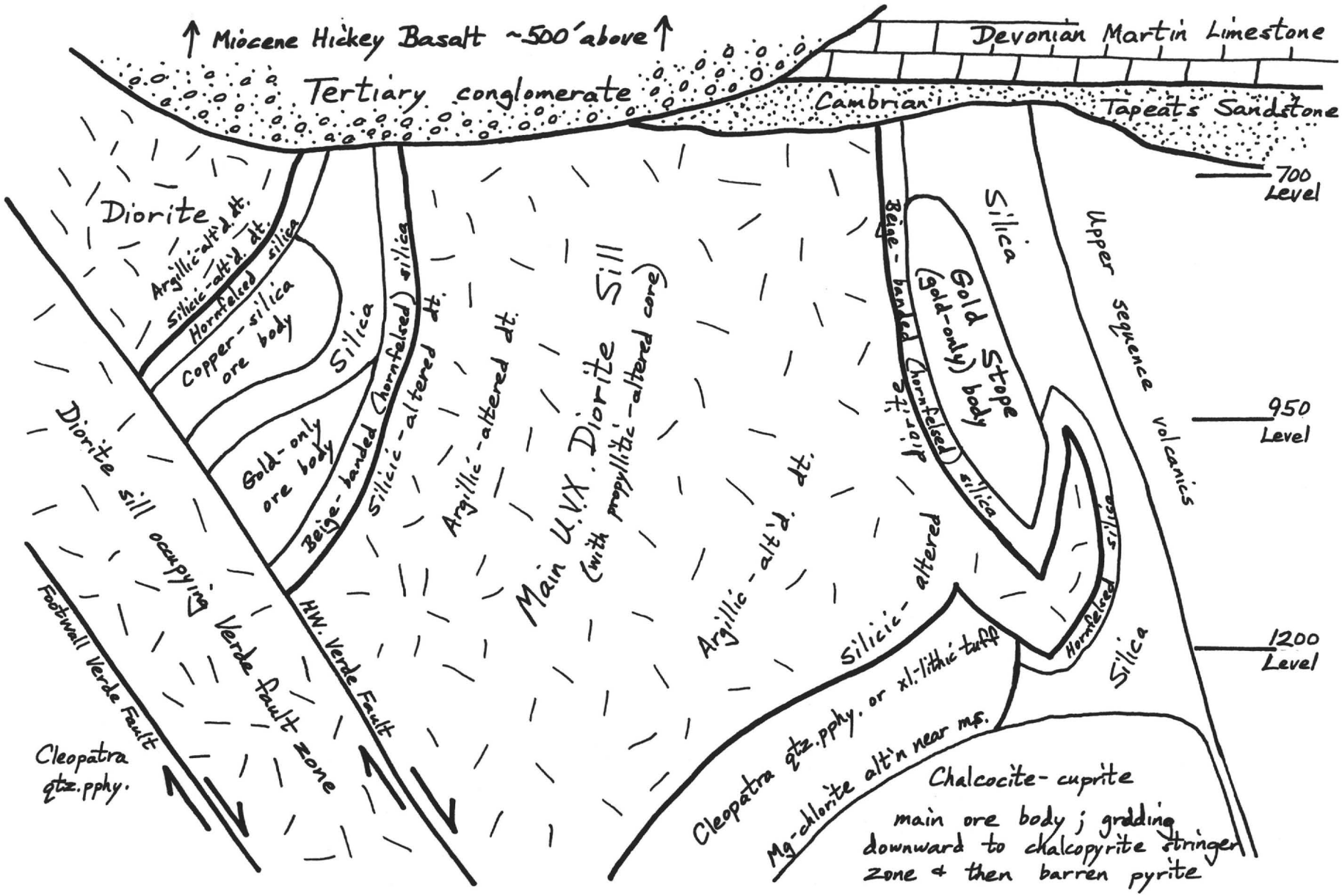


Figure 4 - U.V.X. Schematic X-Sec., looking NW

Showing three ore types with respect to Verde fault, silica bodies, diorite sill, and Precambrian-Paleozoic/Tertiary unconformity.

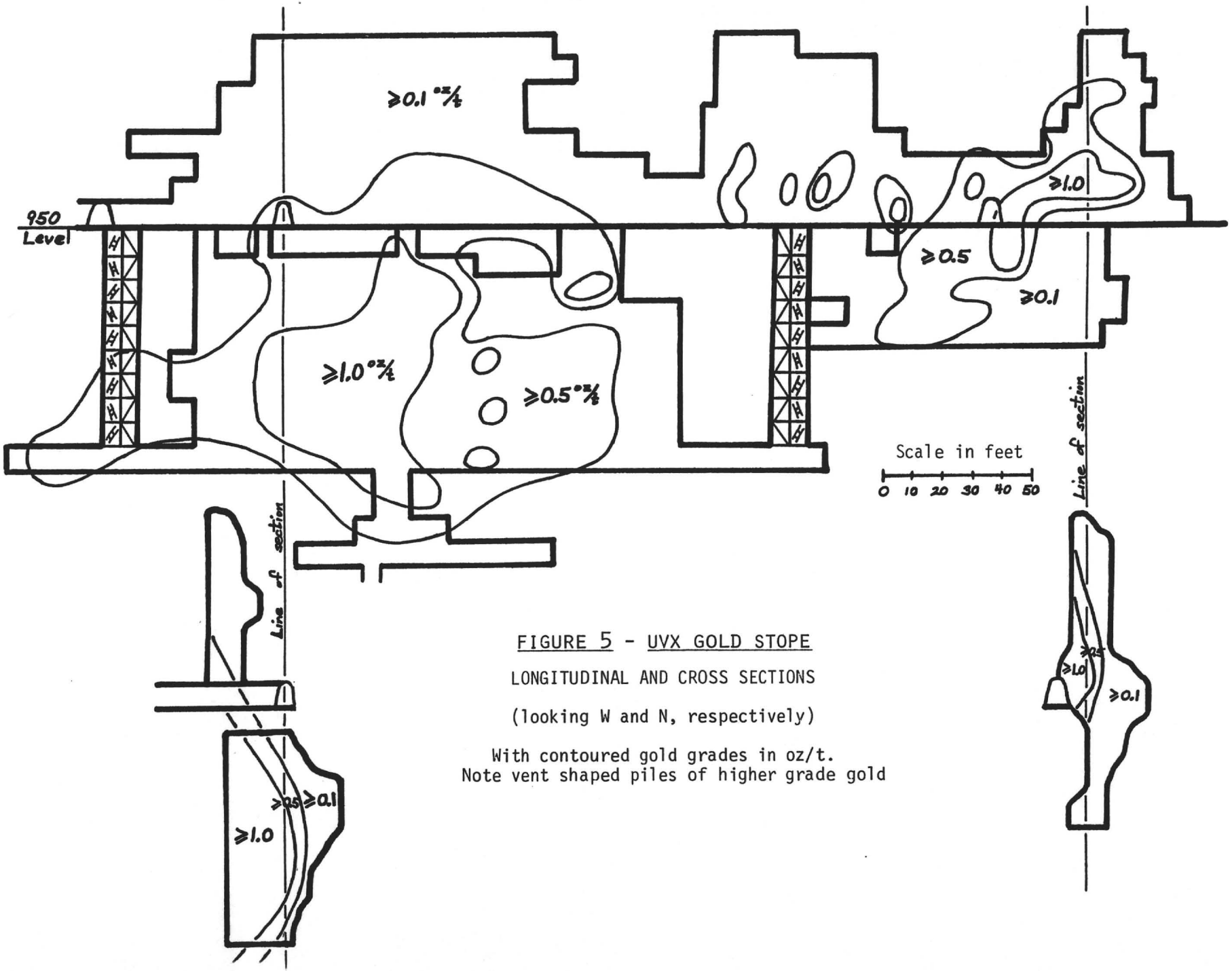


FIGURE 5 - UVX GOLD STOPE

LONGITUDINAL AND CROSS SECTIONS

(looking W and N, respectively)

With contoured gold grades in oz/t.
Note vent shaped piles of higher grade gold

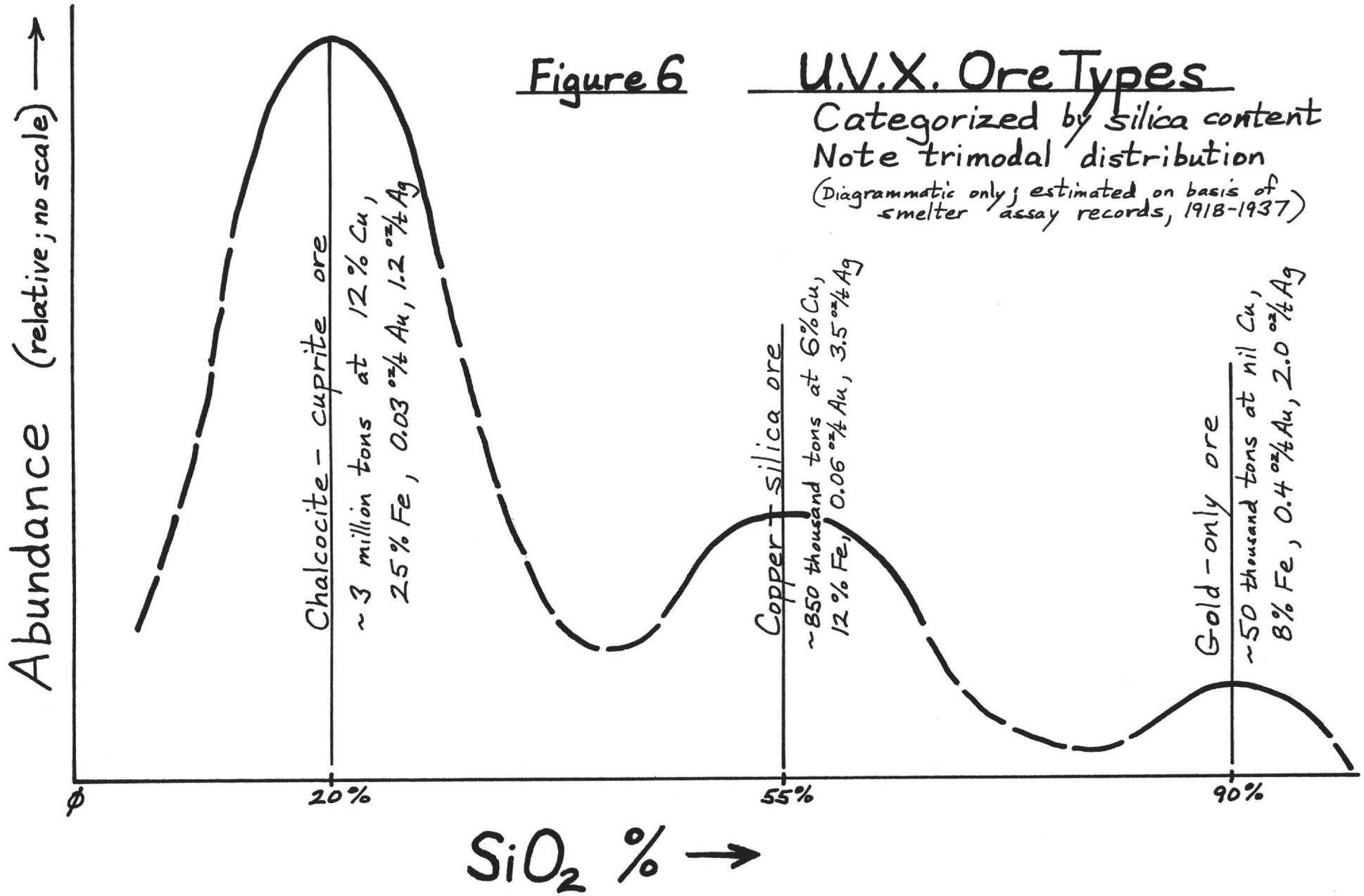
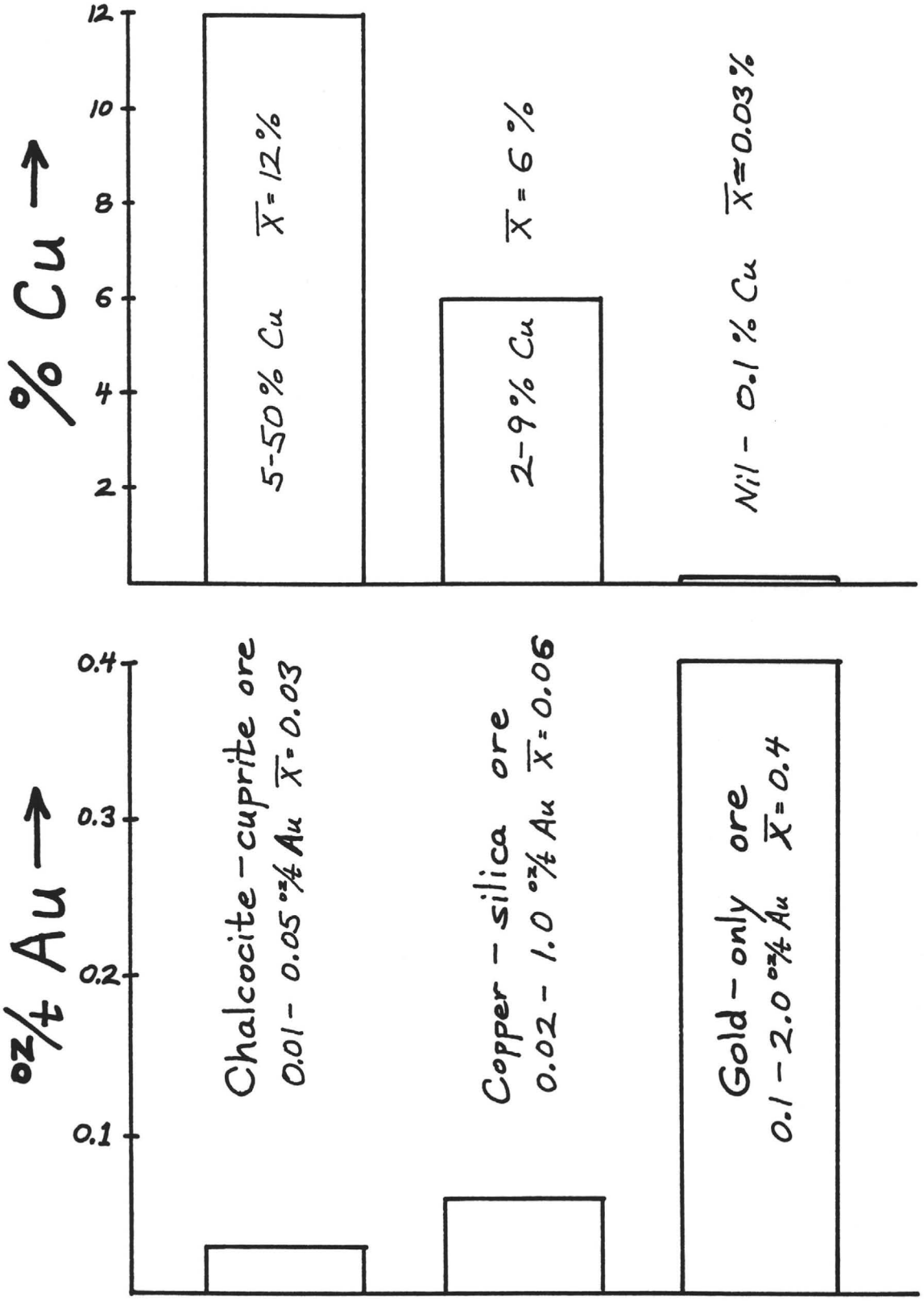


Figure 6 U.V.X. Ore Types

Categorized by silica content

Note trimodal distribution

(Diagrammatic only; estimated on basis of smelter assay records, 1918-1937)



Figures 7 & 8 - Histograms of average copper & gold by ore type for all U.V.X. production.

TABLE 2 - ANALYSES OF UNITED VERDE EXTENSION ORE TYPES PRODUCED*

	CHALCOCITE-CUPRITE			COPPER-SILICA			GOLD-ONLY			TOTAL
Tonnage* (short tons)	3,000,000			850,000			50,000			3,900,000
Grades	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.	
%Cu	5	50	12	2	9	6	Nil	0.1	Nil	10.2
%SiO_2	10	30	20	45	65	55	80	99	90	30
%Fe	20	30	25	4	20	12	1	17	8	22
oz/t Au	.01	.05	.03	.02	1.0	.06	0.1	2.0	0.4	0.04
oz/t Ag	0.5	100.	1.2	2.0	50.	3.5	0.5	10.	2.0	1.7

*Approximate figures, based upon smelter assay data, annual reports, and production records, 1915-1938; new gold reserves not included in chart.

TABLE 3 - CHARACTERISTICS OF UVX METAL CONCENTRATION TYPES

Metal conc. type	CHALCOCITE-CUPRITE	COPPER-SILICA	GOLD-ONLY
Old ore term	Main orebody/1st Class	Silica ore/2nd Class	Gold ore/silica flux
Vertical position	400'-800' beneath Palezoic unconformity	Top 400' of p€	Top 300' of p€
Horizontal position	Nearly equidimensional lobe at top of massive sulfide pipe	N.W. of main orebody and adjacent to (H.W. of) Verde Fault	N and NW of main orebody on stratigraphic top of and parallel to Cu-silica ore. Spatially related to diorite sill.
Ore minerals	Chalcocite, cuprite, native copper, chalcopyrite	Chalcocite, malachite, azurite	Native gold, electrum
Gangue minerals	Pyrite, hematite, silica	Silica, hematite	Silica, hematite, geothite
Footwall rock/ structure	Cleopatra "qtz pphy" or qtz. crystal tuff	Verde Fault	Copper-silica ore or iron rich silica or intrusive (diorite)
Hanging wall rock	Exhalative chert, upper sequence flows, volcaniclastics	Ferruginous silica, "gold-only" silica ore	Intrusive (diorite) and upper sequence flows/ volcaniclastics
Footwall alteration	Chloritization, silicification	Silicification	Silicification
Genetic interpretation	Supergene enrichment of chalcopyrite - pyrite volcanogenic massive sulfide deposit. Possibly some primary chalcocite in a fairly oxygenated environment.	Supergene copper from United Verde, deposited in H.W. breccia along the Verde Fault, with some possible precursor Cu-Au-silica exhalite.	Supergene Au & Ag, Fe & SiO_2 from the U.V., deposited in more distal HW breccias where exhalative Au-silica and silica-Fe fm. had already been locally upgraded by contact metamorphism from the diorite sill.

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December 8, 1988

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Scottsdale, Arizona 85251

Attention: Mr. Dale Allen

Subject: Results of Continued Cyanide Leach Testing Performed on Three (3) each UVX Samples. Our Project No. P-1583B.

Gentlemen:

In accordance with instructions from Mr. Dale Allen, cyanide leach tests were performed on three (3) UVX samples which were ball mill ground to approximately 80 percent minus 200 mesh. These tests were performed to compare gold and silver extractions from ball mill ground ore with extractions from minus 3/8 inch ore reported November 15, 1988 (re: DML P-1583B).

Results indicated a significant increase in gold extractions from ball mill ground samples, however, no significant increase in silver extraction was noted, as summarized below.

P-1583B: A. F. Budge Mining
Bottle Roll Cyanidation Results
UVX Samples

Test	Sample	Size	Gold Assay, oz/ton Residue	Gold Assay, oz/ton Calc. Head	Gold Recovered %	NaCN Consumed lb/ton Ore
5	809	80% -200m	0.021	0.139	84.9	2.71
1	809	-3/8"	0.072	0.108	33.6	1.71
6	902 Low Fe High Au	84% -200m	0.016	0.089	82.1	3.20
2	902 Low Fe High Au	-3/8"	0.029	0.088	67.5	2.74
7	902 High Fe High Au	85% -200m	0.026	0.162	84.0	2.60
3	902 High Fe High Au	-3/8"	0.048	0.168	71.6	2.61

			Silver Assay, oz/ton		Silver Recovered	Lime Consumed
			Residue	Calc. Head	%	lb/ton Ore
5	809	80% -200m	0.56	0.87	35.8	5.3
1	809	-3/8"	0.63	0.73	13.8	3.2
6	902 Low Fe High Au	84% -200m	1.26	1.82	31.1	5.3
2	902 Low Fe High Au	-3/8"	1.26	1.57	20.6	3.1
7	902 High Fe High Au	85% -200m	2.03	4.26	52.4	5.4
3	902 High Fe High Au	-3/8"	2.37	5.09	53.8	3.0

Detailed data sheets are included at the end of this report for the ball mill ground cyanidation tests.

Test procedure consisted of ball mill grinding 1000 grams of minus 20 mesh sample to approximately 80 percent minus 200 mesh. The ground slurry was adjusted to pH 11.5 with hydrated lime and bottle roll leached for 72 hours at 50 percent solids with a 10 lb/ton NaCN solution.

Although no attempts were made to optimize cyanide addition in these preliminary tests, the cyanide consumption may be reduced significantly by reducing the leach solution cyanide strength. Additional test work would be required to determine if a lower strength cyanide solution would reduce precious metal extraction.

If you have any questions or comments regarding this test work, please call.

Sincerely,

DAWSON METALLURGICAL LABORATORIES, INC.

Philip Thompson
Vice President

PT/fg

cc: Mr. Frank Millsaps

P-1538B: A. F. Budge Mining, Inc.
Cyanide Leach Test Results Summary
UVX Samples

Test No.	Sample	Size	Product	Assay, oz/ton Au	Assay, oz/ton Ag	Distribution, % Au	Distribution, % Ag	NaCN Consumed lb/ton Ore
5	809	79.9%	Solution	0.117	0.31	84.9	35.8	2.71
		-200m	Residue	0.021	0.56	15.1	64.2	
			Total (Calc)	0.139	0.87	100.0	100.0	
			Total (Assay)	0.134	0.91			
1	809	-3/8"	Solution	0.036	0.10	33.6	13.8	1.71
			Residue	0.072	0.63	66.4	86.2	
			Total (Calc)	0.108	0.73	100.0	100.0	
			Total (Assay)	0.134	0.91			
6	902	84.4%	Solution	0.071	0.55	82.1	31.1	3.20
	Low Fe	-200m	Residue	0.016	1.26	17.9	68.9	
	High Au		Total (Calc)	0.089	1.82	100.0	100.0	
			Total (Assay)	0.084	2.14			
2	902	-3/8"	Solution	0.059	0.32	67.5	20.6	2.74
	Low Fe		Residue	0.029	1.26	32.5	79.4	
	High Au		Total (Calc)	0.088	1.57	100.0	100.0	
			Total (Assay)	0.084	2.14			
7	902	84.5%	Solution	0.134	2.19	84.0	52.4	2.60
	High Fe	-200m	Residue	0.026	2.03	16.0	47.6	
	High Au		Total (Calc)	0.162	4.26	100.0	100.0	
			Total (Assay)	0.160	4.79			
3	902	-3/8"	Solution	0.118	2.69	71.6	53.8	2.61
	High Fe		Residue	0.048	2.37	28.4	46.2	
	High Au		Total (Calc)	0.168	5.09	100.0	100.0	
			Total (Assay)	0.160	4.79			

All tests performed at 50% solids with a 10 lb/ton NaCN solution. 72 hour bottle roll.

DAWSON METALLURGICAL LABORATORIES, INC.

P. O. BOX 7685
5217 Major Street
Murray, Utah 84107-0685
Phone: 801-262-0922

PROJECT NO. P-1583B
DATE 12/2/88
BY LA

TEST NO. 5 NAME UVX

809 Level

72 hour leach on 20' ball mill grind with 10 lb/ton NaCN soln

Product	Weight	Assay Au	Assay Ag	Units Au	Units Ag	Distribution Au	Distribution Ag	
Leach Solution	1006.0	0.117	0.31	1.1770	3.119	84.86	35.77	V1C
Leach Residue	1000.0	0.021	0.56	0.2100	5.600	15.14	64.23	
Head Calculated	1000.0	0.139	0.87	1.3870	8.719	100.00	100.00	
Total (Assayed)		0.134	0.91					

OPERATION		BM		Start			Off							GRINDING PRODUCT
TIME		20'		10:25			10:25							Leach
REAGENTS - LBS PER TON				Leach			72 Hrs.							Residue
Ore	gm	1000											MESH	%
Water	gm	1000											+ 10	
Lime	gm		3.0										+ 14	
NaCN	gm			5.0									+ 20	
NaCN Titration, lb/ton soln							7.25						+ 28	
CaO Titration, lb/ton soln							0.7						+ 35	
NaCN Consumed, lb/ton ore							2.71						+ 48	0.0
Lime Consumed, lb/ton ore							5.3						+ 65	0.3
													+ 100	1.4
													+ 150	6.6
MACHINE													+ 200	11.8
R.P.M.													+ 325	22.2
pH		8.2	12.0				11.9						-325	57.7
% SOLIDS														100.0
TEMPERATURE														

REMARKS:

DAWSON METALLURGICAL LABORATORIES, INC.

P. O. BOX 7685
5217 Major Street
Murray, Utah 84107-0685
Phone: 801-262-0922

PROJECT NO. P-1583B
DATE 12/2/88
BY LA

TEST NO. 6 NAME UVX

902 Level
Low Fe High Au

72 hour leach on 20' ball mill grind with 10 lb/ton NaCN soln

Product	Weight	Assay Au	Assay Ag	Units Au	Units Ag	Distribution Au	Distribution Ag	
Leach Solution	1026.8	0.071	0.55	0.7290	5.647	82.09	31.07	V1C
Leach Residue	994.2	0.016	1.26	0.1591	12.527	17.91	68.93	
Head Calculated	1000.0	0.089	1.82	0.8881	18.174	100.00	100.00	
Total (Assay)		0.084	2.14					

OPERATION	BM		Start		Off						
TIME	20'		10:45		10:45						
REAGENTS - LBS PER TON			Leach		72 Hrs.						
Ore gm	1000										
Water gm	1000										
Lime gm		3.0									
NaCN gm			5.0								
NaCN Titration, lb/ton soln					6.62						
CaO Titration, lb/ton soln					0.7						
NaCN Consumed, lb/ton ore					3.20						
NaCN Consumed, lb/ton ore					5.3						
MACHINE											
R.P.M.											
pH	8.1	11.8			11.8						
% SOLIDS											
TEMPERATURE											

REMARKS:

MESH	GRINDING PRODUCT Leach Residue %
+ 10	
+ 14	
+ 20	
+ 28	
+ 35	
+ 48	0.0
+ 65	0.0
+ 100	0.7
+ 150	4.8
+ 200	10.1
+ 325	20.8
-325	63.6
	100.0

DAWSON METALLURGICAL LABORATORIES, INC.

P. O. BOX 7685
5217 Major Street
Murray, Utah 84107-0685
Phone: 801-262-0922

PROJECT NO. P-1583B
DATE 12/2/88
BY LA

TEST NO. 7 NAME UVX

902 Level
High Fe High Au

72 hour leach on 20' ball mill grind with 10 lb/ton NaCN soln

Product	Weight	Assay Au	Assay Ag	Units Au	Units Ag	Distribution Au	Distribution Ag
Leach Solution	1019.0	0.134	2.19	1.3655	22.316	84.03	52.42
Leach Residue	998.0	0.026	2.03	0.2595	20.259	15.97	47.58
Head Calculated	1000.0	0.162	4.26	1.6249	42.576	100.00	100.00
Total (Assay)		0.160	4.79				

V1C

OPERATION		BM		Start		Off								GRINDIN PRODUC
TIME		20'		11:50		11:50								Leach
REAGENTS - LBS PER TON				Leach		72 Hrs.								Residue
Ore	gm	1000											MESH	%
Water	gm	1000											+ 10	
Lime	gm		3.0										+ 14	
NaCN	gm			5.0									+ 20	
NaCN Titration, lb/ton soln						7.26							+ 28	
CaO Titration, lb/ton soln						0.6							+ 35	
NaCN Consumed, lb/ton ore						2.60							+ 48	0.0
Lime Consumed, lb/ton ore						5.4							+ 65	0.1
													+ 100	0.7
													+ 150	4.7
MACHINE													+ 200	10.0
R.P.M.													+ 325	20.4
pH		8.2	11.9			11.8							-325	64.1
% SOLIDS														100.0
TEMPERATURE														

REMARKS:

ASSAY REPORT SHEET

ASSAY LAB, INC.
1376 W. 8040 So. Unit #4
West Jordan, Utah 84084

Date Received _____ **Date Reported** 12/8/88

Client Dawson Metallurgical Labs

Sample Identification	Oz / Ton Au	Oz / Ton Ag	Remarks
P-1583B			* Ounces per ton of 2000 lbs.
U V X			
Leach Residues			
Test #5			
809 Level	.019	.57	
	.023	.55	
Test #6			
902 Level Low			
Fe High Au	.015	1.26	
	.016	1.26	
Test #7			
902 Level high			
Fe high Au	.026	2.03	
	.025	2.03	
Leach Sol'n.			
Test #5			
809 Level	.117	.31	
	.117	.31	
Test #6			
902 Level Low			
Fe high Au	.071	.55	
	.071	.55	
Test #7			
902 Level high			
Fe high Au	.133	2.19	
	.134	2.19	

Ronald Dianch

P-1538B: A. F. Budge Mining, Inc.
Cyanide Leach Test Results Summary
UVX Samples

Test No.	Sample	Size	Product	Assay, oz/ton Au	Assay, oz/ton Ag	Distribution, % Au	Distribution, % Ag	NaCN Consumed lb/ton Ore
5	809	79.9%	Solution	0.117	0.31	84.9	35.8	2.71
		-200m	Residue	0.021	0.56	15.1	64.2	
			Total (Calc)	0.139	0.87	100.0	100.0	
			Total (Assay)	0.134	0.91			
1	809	-3/8"	Solution	0.036	0.10	33.6	13.8	1.71
			Residue	0.072	0.63	66.4	86.2	
			Total (Calc)	0.108	0.73	100.0	100.0	
			Total (Assay)	0.134	0.91			
6	902	84.4%	Solution	0.071	0.55	82.1	31.1	3.20
	Low Fe	-200m	Residue	0.016	1.26	17.9	68.9	
	High Au		Total (Calc)	0.089	1.82	100.0	100.0	
			Total (Assay)	0.084	2.14			
2	902	-3/8"	Solution	0.059	0.32	67.5	20.6	2.74
	Low Fe		Residue	0.029	1.26	32.5	79.4	
	High Au		Total (Calc)	0.088	1.57	100.0	100.0	
			Total (Assay)	0.084	2.14			
7	902	84.5%	Solution	0.134	2.19	84.0	52.4	2.60
	High Fe	-200m	Residue	0.026	2.03	16.0	47.6	
	High Au		Total (Calc)	0.162	4.26	100.0	100.0	
			Total (Assay)	0.160	4.79			
3	902	-3/8"	Solution	0.118	2.69	71.6	53.8	2.61
	High Fe		Residue	0.048	2.37	28.4	46.2	
	High Au		Total (Calc)	0.168	5.09	100.0	100.0	
			Total (Assay)	0.160	4.79			

All tests performed at 50% solids with a 10 lb/ton NaCN solution. 72 hour bottle roll.

DAWSON METALLURGICAL LABORATORIES, INC.

P.O. Box 7685
5217 Major Street
Murray, Utah 84107-0685
Phone: 801-262-0922

November 15, 1988

A. F. Budge Mining Ltd.
4301 North 75th Street
Suite 101
Scottsdale, Arizona 85251

Attention: Mr. Dale Allen

Subject: Results of Cyanide Leach Tests Performed on Three (3) Each UVX Samples. Our Project No. P-1583B.

Gentlemen:

In accordance with discussions between Mr. Dale Allen and ourselves, cyanide leach tests were performed on three (3) each minus 3/8 inch UVX samples to determine gold and silver extraction.

Three each samples from the UVX project were received at our laboratory November 11, 1988, and assigned our Lot No. P-1583B. These samples were approximately minus four inches in size and weighed 28 kilograms each. Each sample was crushed through 3/8 inch and two kilograms carefully split out, stage crushed through 20 mesh, and a head sample submitted for gold and silver fire assay. Head assay results are presented below and compared with back-calculated head assays from testwork:

P-1583B: A. F. Budge Mining
Head Assay Results: UVX Samples

Sample	Head Assay, oz/ton		Back-Calc. Head, oz/ton	
	Au	Ag	Au	Ag
809 Level	0.134	0.91	0.108	0.73
902 Level (Low Fe High Au)	0.084	2.14	0.088	1.57
902 Level (High Fe High Au)	0.160	4.79	0.168	5.09

Each minus 3/8 inch sample was bottle rolled at 50 percent solids for 72 hours with a 10 lb/ton NaCN solution (initial concentration). Test results indicate that the 902 level (high Fe high Au) sample responded better than the other two samples: A leach residue assaying 0.048 oz/ton Au and 2.37 oz/ton Ag was obtained from from a 0.168 oz/ton Au, 5.09 oz/ton Ag back-calculated head. These results are summarized below, and are also presented in data summary sheets attached to the end of this report.

P-1583B: A. F. Budge Mining
Bottle Roll Cyanidation Results: -3/8" UVX Samples

Test	Sample	Gold Assay, oz/ton Residue	Gold Assay, oz/ton Calc. Head	Gold Recovered, %	Reagents Consumed lb/ton Ore NaCN	Reagents Consumed lb/ton Ore Lime
1	809 Level	0.072	0.108	33.6	1.71	3.2
2	902 Level (Low Fe High Au)	0.029	0.088	67.5	2.74	3.1
3	902 Level (High Fe High Au)	0.048	0.168	71.6	2.61	3.0

		Silver Assay, oz/ton Residue	Silver Assay, oz/ton Calc. Head	Silver Recovered %
1	809 Level	0.63	0.73	13.8
2	902 Level (Low Fe High Au)	1.26	1.57	20.6
3	902 Level (High Fe High Au)	2.37	5.09	53.8

No attempts were made to optimize conditions in these tests, however, reducing the cyanide leach solution strength should reduce the cyanide consumption considerably. No improvements in gold or silver extractions from minus 3/8 inch ore is anticipated by optimizing test conditions.

Test procedure consisted of mixing three kilograms of minus 3/8 inch sample with three liters of water and adjusting the slurry pH to 11-11.5 with hydrated lime. Cyanide was added to provide an initial leach solution concentration of 10 lbs NaCN per ton of solution, and the slurry was bottle rolled for 72 hours. The slurry was subsequently

weighed, filtered, the filter cake washed and dried. The dry leach residue was then split into two portions: one split was stored at minus 3/8 inch for a possible residue assay screen, and the other split crushed through 20 mesh, a residue sample split out, pulverized and submitted for gold and silver assay.

If you have any questions or comments regarding this testwork, or we can be of additional service, please call.

Sincerely,

DAWSON METALLURGICAL LABORATORIES, INC.

Philip Thompson

Philip Thompson
Vice President

PT/fg

cc: Mr. Frank Millsaps
Millsaps Mineral Service
3865 Wasatch Blvd.
Room 2021
Salt Lake City, Utah 84109

P-1583B: A.F.Budge Mining, Inc.
Cyanide Leach Test Results Summary
UVX Samples

Test No.	Product	Weight, grams	Assay, oz/t Au	Assay, oz/t Ag	Distribution, % Au	Distribution, % Ag	NaCN* #/t ore
1	Leach Solution	3028.0	0.036	0.10	33.56	13.82	1.71
	Leach Residue	2997.0	0.072	0.63	66.44	86.18	
	Total (Calc)	3000.0	0.108	0.73	100.00	100.00	
	Total (Assay)		0.134	0.91			
2	Leach Solution	3032.0	0.059	0.32	67.53	20.61	2.74
	Leach Residue	2966.0	0.029	1.26	32.47	79.39	
	Total (Calc)	3000.0	0.088	1.57	100.00	100.00	
	Total (Assay)		0.084	2.14			
3	Leach Solution	3052.0	0.118	2.69	71.57	53.75	2.61
	Leach Residue	2981.0	0.048	2.37	28.43	46.25	
	Total (Calc)	3000.0	0.168	5.09	100.00	100.00	
	Total (Assay)		0.160	4.79			

Test No.1: 809 Level
Test No.2: 902 Level Low Fe, High Au
Test No.3: 902 Level High Fe, High Au

72hr Leach on 3 kilograms of -3/8" sample.
50% solids, 10lb NaCN per ton Solution.

***lbs NaCN consumed per ton of ore.**

DAWSON METALLURGICAL LABORATORIES, INC.

P. O. BOX 7685
5217 Major Street
Murray, Utah 84107
Phone: 801-262-0922

PROJECT NO. P-1583B
DATE 11/4/88
BY LA

TEST NO. 1 NAME UVX

809 Level

72 hour leach on -3/8" ore with 10 lb/ton NaCN Soln

Product	Weight	Assay Au	Assay Ag	Units Au	Units Ag	Distribution Au	Distribution Ag	
Leach Solution	3028.0	0.036	0.10	1.0901	3.028	33.56	13.82	V1C
Leach Residue	2997.0	0.072	0.63	2.1578	18.881	66.44	86.18	
Head Calculated	3000.0	0.108	0.73	3.2479	21.909	100.00	100.00	
Total (Assay)		0.134	0.91					

OPERATION			Start			Off							GRINDING PRODUCT	
TIME			9:30			9:30								
REAGENTS - LBS PER TON			Leach			72 hrs.								
Ore -3/8" gm	3000											MESH	%	%
Water gm	3000											+10		
Lime gm		5.0										+14		
NaCN gm			15.0									+20		
NaCN Titration lb/ton Soln						8.21						+28		
CaO Titration lb/ton Soln						0.1						+35		
NaCN Consumed lb/ton Ore						1.71						+48		
Lime Consumed lb/ton Ore						3.2						+65		
												+100		
												+150		
MACHINE												+200		
R.P.M.												+325		
pH	7.8	11.8				10.8						-325		
% SOLIDS														
TEMPERATURE														

REMARKS:

DAWSON METALLURGICAL LABORATORIES, INC.

P. O. BOX 7685
5217 Major Street
Murray, Utah 84107
Phone: 801-262-0922

PROJECT NO. P-1583B
DATE 11/4/88
BY LA

TEST NO. 2 NAME UVX

902 Level
Low Fe, High Au

72 hour leach on -3/8" ore with 10 lb/ton NaCN Soln

Product	Weight	Assay Au	Assay Ag	Units Au	Units Ag	Distribution Au	Distribution Ag	
Leach Solution	3032.0	0.059	0.32	1.7889	9.702	67.53	20.61	V1C
Leach Residue	2966.0	0.029	1.26	0.8601	37.372	32.47	79.39	
Head Calculated	3000.0	0.088	1.57	2.6490	47.074	100.00	100.00	
Total (Assay)		0.084	2.14					

OPERATION				Start			Off							GRINDING PRODUCT	
TIME				9:39			9:39								
REAGENTS - LBS PER TON				Leach			72 hrs.								
Ore -3/8"	gm	3000											MESH	%	%
Water	gm	3000											+10		
Lime	gm		5.0										+14		
NaCN	gm			15.0									+20		
NaCN Titration lb/ton Soln							7.18						+28		
CaO Titration, lb/ton Soln							0.2						+35		
NaCN Consumed, lb/ton Ore							2.74						+48		
Lime Consumed, lb/ton Ore							3.1						+65		
													+100		
													+150		
MACHINE													+200		
R.P.M.													+325		
pH		7.7	11.7				10.3						-325		
% SOLIDS															
TEMPERATURE															

REMARKS:

DAWSON METALLURGICAL LABORATORIES, INC.

P. O. BOX 7685
5217 Major Street
Murray, Utah 84107
Phone: 801-262-0922

PROJECT NO. P-1583B
DATE 11/4/88
BY LA

TEST NO. 3 NAME UVX

902 Level
High Fe, high Au

72 hour leach on -3/8" ore with 10 lb/ton NaCN Soln

Product	Weight	Assay Au	Assay Ag	Units Au	Units Ag	Distribution Au	Distribution Ag	
Leach Solution	3052.0	0.118	2.69	3.6014	82.099	71.57	53.75	V1C
Leach Residue	2981.0	0.048	2.37	1.4309	70.650	28.43	46.25	
Head Calculated	3000.0	0.168	5.09	5.0322	152.749	100.00	100.00	
Total (Assay)		0.160	4.79					

OPERATION			Start			Off							GRINDING PRODUCT	
TIME			9:44			9:44								
REAGENTS - LBS PER TON			Leach			72 hrs.								
Ore gm	3000											MESH	%	%
Water gm	3000											+10		
Lime gm		5.0										+14		
NaCN gm			15.0									+20		
NaCN Titration, lb/ton Soln						7.26						+28		
CaO Titration, lb/ton Soln						0.2						+35		
NaCN Consumed, lb/ton Ore						2.61						+48		
Lime Consumed, lb/ton Ore						3.0						+65		
												+100		
												+150		
MACHINE												+200		
R.P.M.												+325		
pH	7.3	11.8				10.6						-325		
% SOLIDS														
TEMPERATURE														

REMARKS:

ASSAY REPORT SHEET

ASSAY LAB, INC.
1376 W. 8040 So. Unit #4
West Jordan, Utah 84084

Date Received _____ Date Reported 11/8/88

Client Dawson Metallurgical Labs

Sample Identification	Oz/Ton Au	Oz/Ton Ag	Remarks
P-1583B U V X			* Ounces per ton of 2000 lbs.
Head Samples			
#809	.133	.91	
	.134	.91	
#902 high Fe high Au	.161	To Follow	
	.159	" "	
#902 low Fe high Au	.084	To Follow	
	.084	" "	

Ronald Bianchi

ASSAY REPORT SHEET

ASSAY LAB, INC.
1376 W. 8040 So. Unit #4
West Jordan, Utah 84084

Date Received _____ Date Reported 11/9/88

Client Dawson Metallurgical Labs

Sample Identification	Oz / Ton Au	Oz / Ton Ag	Remarks
P-1583B			* Ounces per ton of 2000 lbs.
U V X			
Head Samples			
#902 high Fe high Au		4.79	
#902 low Fe high Au		2.14	

Ronald Bianchi

ASSAY REPORT SHEET

ASSAY LAB, INC.
1376 W. 8040 So. Unit #4
West Jordan, Utah 84084

Date Received _____ Date Reported 11/10/88

Client Dawson Metallurgical Labs

Sample Identification	Oz / Ton Au	Oz / Ton Ag	Remarks
			* Ounces per ton of 2000 lbs.
P-1583B			
U V X			
Leach Residues			
Test #1			
#809	.072	.63	
	.071	.63	
Test #2			
902 low Fe high Au	.027	1.26	
	.030	1.26	
Test #3			
902 high Fe High Au	.048	2.37	
	.047	2.37	

Ronald Bianchi

ASSAY REPORT SHEET

ASSAY LAB, INC.
1376 W. 8040 So. Unit #4
West Jordan, Utah 84084

Date Received _____ Date Reported 11/11/88

Client Dawson Metallurgical Labs

Sample Identification	Oz/Ton Au	Oz/Ton Ag	Remarks
P-1583B			* Ounces per ton of 2000 lbs.
U V X			
Leach Sol'n.			
Test #1			
#809	.035	.10	
	.036	.10	
Test #2			
#902 Low Fe high Au	.058	.32	
	.059	.32	
#902 high Fe high Au	.117	2.69	
	.118	2.69	

Ronald Barnelo

DAWSON METALLURGICAL LABORATORIES, INC.

P.O. Box 7685
5217 Major Street
Murray, Utah 84107-0685
Phone: 801-262-0922

September 30, 1988

RECEIVED OCT 3 1988

A. F. Budge Mining Ltd.
4301 North 75th Street
Suite 101
Scottsdale, Arizona 85251

Attention: Carole A. O'Brien

Subject: Results of Cyanide Leach and Residue Assay Screen Analysis of a Sample of UVX Ore. Our Project No. P-1583A.

In accordance with discussions with Mr. Frank Millsaps a cyanide leach test was performed on 3 kilograms of minus 1½ inch (as received) sample from the United Verde Extension Project to determine gold and silver extraction. In addition, an assay-screen analysis was performed on the leach residue to determine the distribution of unleached gold and silver.

Cyanide leach results on this sample, identified as "yellow grit - stope run material" indicated that 67% of the gold and 12% of the silver was leached in 72 hours. A leach residue assaying 0.020 oz/ton gold and 1.14 oz/ton silver was obtained from a 0.060 oz/ton gold, 1.29 oz/ton silver back-calculated head. Results are summarized below:

P-1583A: A. F. Budge
Cyanidation Results: UVX Sample

Product	Assay, oz/ton		Distribution, %	
	Au	Ag	Au	Ag
Solution	0.040	0.15	66.75	11.67
Residue	0.020	1.14	33.25	88.33
Total (calc)	0.060	1.29	100.00	100.00
Total (assay)	0.063	1.06		

NaCn consumed: 1.82 lb/ton ore
Lime consumed: 3.1 lb/ton ore

P-1583A: A. F. Budge
Leach Residue Assay Screen Analyses

Screen Size, Mesh	Weight Percent	Assay, oz/ton Au	Ag
+¼"	14.62	0.043	0.98
-¼ +10 mesh	21.34	0.030	1.06
-10 +35	16.19	0.021	1.01
-35 +100	7.08	0.015	0.96
-100	40.77	0.006	1.31
Total	100.00	0.020	1.14

Approximately 10 pounds of minus 1½ inch UVX sample identified as "Yellow Grit-Stope Run Material" was received at our laboratory September 20, 1988, and assigned our Lot No. P-1583A. Approximately 500 grams of sample was split out, crushed through 20 mesh and a pulverized split submitted for gold and silver assay.

Three kilograms of sample was mixed with 3 liters of water and the pulp pH adjusted to 11.0-11.5 with hydrated lime. Sodium cyanide was added to provide a leach solution containing 10 lbs NaCN per ton of solution and the slurry was bottle rolled for 72 hours. The leach slurry was then weighed, filtered and washed: The washed leach residue was wet screened on ¼ inch, 10, 35, and 100 mesh. Each fraction was dried, weighed and submitted for gold and silver assay along with the full strength leach solution.

If you have any questions or comments regarding this testwork, please call.

Sincerely,

DAWSON METALLURGICAL LABORATORIES, INC.

Philip Thompson

Philip Thompson
Vice President

PT/fg

cc: Mr. Frank Millsaps

DAWSON METALLURGICAL LABORATORIES, INC.

P. O. BOX 7685
5217 Major Street
Murray, Utah 84107
Phone: 801-262-0922

PROJECT NO. P-1583A
DATE 9/23/88
BY LA

TEST NO. 1 NAME UVX

72 hour leach on as received ore with 10 lb/ton NaCN Soln followed by assay screen

Product	Weight	Assay Au	Assay Ag	Units Au	Units Ag	Distribution Au	Distribution Ag
Leach Solution	3006.0	0.040	0.15	1.2024	4.509	66.75	11.67
Leach Residue	2995.0	0.020	1.14	0.5990	34.143	33.25	88.33
Head Calculated	3000.0	0.060	1.29	1.8014	38.652	100.00	100.00

Product		Weight	% Wt.	Assay Au	Assay Ag	Units Au	Units Ag	Distribution Au	Distribution Ag
+1/4"	Leach Res	438.0	14.62	0.043	0.98	0.0063	0.143	32.09	12.63
-1/4"+10m	Leach Res	639.0	21.34	0.030	1.06	0.0064	0.226	32.66	19.92
-10+35m	Leach Res	485.0	16.19	0.021	1.01	0.0034	0.164	17.35	14.41
-35+100m	Leach Res	212.0	7.08	0.015	0.96	0.0011	0.068	5.42	5.99
-100mesh	Leach Res	1221.0	40.77	0.006	1.31	0.0024	0.534	12.48	47.05
Calculated		2995.0	100.00	0.020	1.14	0.0196	1.135	100.00	100.00

OPERATION			Start			Off							GRINDING PRODUCT	
TIME			7:35			7:35								
REAGENTS - LBS PER TON			Leach			72 hrs.								
Ore gm	3000											MESH	%	%
Water gm	3000											+10		
Lime gm		5.0										+14		
NaCN gm			15.0									+20		
NaCN Titration, lb/ton	Ore					8.16						+28		
CaO Titration, lb/ton	Ore					0.2						+35		
NaCN consumed, lb/ton	Ore					1.82						+48		
Lime consumed, lb/ton	Ore					3.1						+65		
												+100		
												+150		
MACHINE												+200		
R.P.M.												+325		
pH	7.5	11.9				11.0						-325		
% SOLIDS														
TEMPERATURE														

REMARKS:

ASSAY REPORT SHEET

ASSAY LAB, INC.
1376 W. 8040 So. Unit #4
West Jordan, Utah 84084

Date Received _____ Date Reported 9/29/88

Client Dawson Metallurgical Labs

Sample Identification	Oz/Ton Au	Oz/Ton Ag	Remarks
			* Ounces per ton of 2000 lbs.
P-1583A			
U V X			
Leach Residues			
Test #1			
+¼"	.042	.98	
	.043	.98	
-¼+10mesh	.030	1.06	
	.030	1.06	
-10+35mesh	.020	1.01	
	.022	1.01	
-35+100mesh	.014	.96	
	.016	.96	
-100mesh	.006	1.31	
	.005	1.30	
Leach Sol'n.			
Test #1	.040	.15	
	.040	.15	

Ronald Bianchi

ASSAY REPORT SHEET

ASSAY LAB, INC.
1376 W. 8040 So. Unit #4
West Jordan, Utah 84084

Date Received _____ Date Reported 9/26/88

Client Dawson Metallurgical Labs

Sample Identification	Oz / Ton Au	Oz / Ton Ag	Remarks
P-1583A UVX			* Ounces per ton of 2000 lbs.
Head Sample	.062	1.06	
	.064	1.06	

Ronald Bucinski

DAWSON METALLURGICAL LABORATORIES, INC.

P.O. Box 7685
5217 Major Street
Murray, Utah 84107-0685
Phone: 801-262-0922

December 29, 1988

A. F. Budge Mining, Ltd.
4301 North 7th Street, Suite 101
Scottsdale, Arizona 85251

RECEIVED JAN 4 1989

Attention: Mr. Dale Allen
Ms. Carole O'Brien

Subject: Results of Timed Cyanide Leach Tests Performed on Two (2) UVX Samples. Our Project No. P-1583C.

Gentlemen:

In accordance with discussions between Mr. Dale Allen and ourselves, cyanide leach tests were performed on two ball mill ground UVX samples. These tests were performed to determine the variation in gold and silver extraction with time from samples ground to approximately 90 percent minus 200 mesh.

Two minus five inch UVX samples weighing 20 kilograms each were received at our laboratory December 15 and assigned our Lot No. P-1583C.

Each sample was separately crushed through 1/2 inch and split into two equal portions. One portion was stored at minus 1/2 inch, while the other portion was stage crushed through 20 mesh using a rolls crusher. A kilogram of sample was split out, pulverized, and submitted for gold and silver analysis by standard fire assay. Head assay results are summarized below.

P-1583C: A. F. Budge Mining, Ltd.
Head Assay Results: UVX Samples

Sample	Head Assay, oz/ton Au	Ag
No. 1 (Assayed)	0.617	13.36
No. 1 (Back-Calc.)	0.664	13.50
No. 2 (Assayed)	0.175	3.09
No. 2 (Back-Calc.)	0.172	3.18

These samples appeared highly oxidized; no sulfides were detected under the binocular microscope.

Test results, summarized in the following table, indicate that approximately 60 percent of the gold and 50 percent of the silver was extracted from Sample No. 1 in 24 hours. Approximately 80 percent of the gold and 20 percent of the silver was extracted from Sample No. 2 in 24 hours. No significant increase in either gold or silver extraction from either sample was observed as the leach time was increased from 24 to 72 hours.

P-1583C: A. F. Budge Mining, Ltd.
Cyanide Leach Results: UVX Samples

Test No.	Sample	Leach Time, Hours	Gold Assay, oz/Ton Residue	Gold Assay, oz/Ton Calc. Head	Gold Extracted, %	Reagents Consumed, lb/Ton Ore NaCN	Reagents Consumed, lb/Ton Ore Lime
1	No. 1	24	0.268	0.659	59.4	2.42	4.3
2	No. 1	48	0.259	0.661	60.9	2.25	4.0
3	No. 1	72	0.285	0.672	57.6	4.14	4.1
4	No. 2	24	0.031	0.170	81.8	3.67	5.4
5	No. 2	48	0.030	0.171	82.5	3.43	5.0
6	No. 2	72	0.028	0.174	84.0	3.49	5.4

			Silver Assay, oz/Ton Residue	Silver Assay, oz/Ton Calc. Head	Silver Extracted %
1	No. 1	24	6.33	13.45	53.0
2	No. 1	48	6.65	13.53	50.9
3	No. 1	72	6.84	13.51	49.4
4	No. 2	24	2.47	3.11	20.7
5	No. 2	48	2.46	3.13	21.7
6	No. 2	72	2.64	3.31	20.7

These samples were ball mill ground to approximately 90 percent minus 200 mesh and bottle roll leached at 50 percent solids for a measured period of time with a ten lb/ton NaCN solution (initial concentration). Hydrated lime was added as required to maintain the pulp pH at 11-11.5.

A significant reduction in cyanide consumption may be obtained by reducing the leach solution strength without adversely affecting gold or silver recovery, however, no attempts were made to optimize cyanide addition in these tests.

If you have any questions or comments concerning this test work, please call.

Sincerely,

DAWSON METALLURGICAL LABORATORIES, INC.

Philip Thompson

Philip Thompson
Vice President

PT/fg

cc: Mr. Frank Millsaps
Millsaps Mineral Service

DAWSON METALLURGICAL LABORATORIES, INC.

P. O. BOX 7685
5217 Major Street
Murray, Utah 84107-0685
Phone: 801-262-0922

PROJECT NO. P-1583C
DATE 12/19/88
BY LA

TEST NO. 1 NAME A. F. Budge #1

24 hour leach on 20' ball mill grind with 10 lb/ton NaCN soln

Product	Weight	Assay Au	Assay Ag	Units Au	Units Ag	Distribution Au	Distribution Ag	
Leach Solution	1006.0	0.389	7.08	3.9133	71.225	59.35	52.95	V1C
Leach Residue	1000.0	0.268	6.33	2.6800	63.300	40.65	47.05	
Head Calculated	1000.0	0.659	13.45	6.5933	134.525	100.00	100.00	
Total (Assay)		0.617	13.36					

OPERATION		BM		Start		Off								GRINDING PRODUCT
TIME		20'		8:26		8:26								Leach
REAGENTS - LBS PER TON				Leach		24 Hrs.								Residue
Ore	gm	1000											MESH	%
Water	gm	1000											+ 10	
Lime	gm		2.5										+ 14	
NaCN	gm			5.0									+ 20	
NaCN Titration, lb/ton soln						7.54							+ 28	
CaO Titration, lb/ton soln						0.7							+ 35	
NaCN Consumed, lb/ton ore						2.42							+ 48	0.0
Lime Consumed, lb/ton ore						4.3							+ 65	0.0
													+ 100	0.0
													+ 150	1.8
MACHINE													+ 200	6.7
R.P.M.													+ 325	23.7
pH		8.1	12.1			11.9							-325	67.8
% SOLIDS														100.0
TEMPERATURE														

REMARKS:

DAWSON METALLURGICAL LABORATORIES, INC.

P. O. BOX 7685
5217 Major Street
Murray, Utah 84107-0685
Phone: 801-262-0922

PROJECT NO. P-1583C
DATE 12/19/88
BY LA

TEST NO. 2 NAME A. F. Budge #1

48 hour leach on 20' ball mill grind with 10 lb/ton NaCN soln

Product	Weight	Assay Au	Assay Ag	Units Au	Units Ag	Distribution Au	Distribution Ag	
Leach Solution	1001.4	0.402	6.87	4.0256	68.796	60.86	50.86	V1C
Leach Residue	999.6	0.259	6.65	2.5890	66.473	39.14	49.14	
Head Calculated	1000.0	0.661	13.53	6.6146	135.270	100.00	100.00	
TOTAL (Assay)		0.617	13.36					

OPERATION	BM		Start		Off
TIME	20'		8:54		8:54
REAGENTS - LBS PER TON			Leach		48 Hrs.
Ore gm	1000				
Water gm	1000				
Lime gm		2.5			
NaCN gm			5.0		
NaCN Titration, lb/ton soln					7.74
CaO Titration, lb/ton soln					1.0
NaCN Consumed, lb/ton ore					2.25
Lime Consumed, lb/ton ore					4.0
MACHINE					
R.P.M.					
pH	8.1	11.9			11.9
% SOLIDS					
TEMPERATURE					

GRINDING PRODUCT	
MESH	%
+ 10	
+ 14	
+ 20	
+ 28	
+ 35	
+ 48	
+ 65	
+ 100	
+ 150	
+ 200	
+ 325	
-325	

REMARKS:

DAWSON METALLURGICAL LABORATORIES, INC.

P. O. BOX 7685
5217 Major Street
Murray, Utah 84107-0685
Phone: 801-262-0922

PROJECT NO. P-1583C
DATE 12/19/88
BY LA

TEST NO. 3 NAME A. F. Budge #1

72 hour leach on 20' ball mill grind with 10 lb/ton NaCN soln

Product	Weight	Assay Au	Assay Ag	Units Au	Units Ag	Distribution Au	Distribution Ag	
Leach Solution	1020.0	0.379	6.54	3.8658	66.708	57.56	49.37	V1C
Leach Residue	1000.0	0.285	6.84	2.8500	68.400	42.44	50.63	
Head Calculated	1000.0	0.672	13.51	6.7158	135.108	100.00	100.00	
Total (Assay)		0.617	13.36					

OPERATION		BM		Start		Off								GRINDING PRODUCT	
TIME		20'		9:38		9:38									
REAGENTS - LBS PER TON				Leach		72 Hrs.									
Ore	gm	1000											MESH	%	
Water	gm	1000											+ 10		
Lime	gm		2.5										+ 14		
NaCN	gm			5.0									+ 20		
NaCN Titration, lb/ton soln						5.75							+ 28		
CaO Titration, lb/ton soln						0.9							+ 35		
NaCN Consumed, lb/ton ore						4.14							+ 48		
Lime Consumed, lb/ton ore						4.1							+ 65		
													+ 100		
													+ 150		
MACHINE													+ 200		
R.P.M.													+ 325		
pH		8.1	12.2			11.9							-325		
% SOLIDS															
TEMPERATURE															

REMARKS:

DAWSON METALLURGICAL LABORATORIES, INC.

P. O. BOX 7685
5217 Major Street
Murray, Utah 84107-0685
Phone: 801-262-0922

PROJECT NO. P-1583C
DATE 12/19/88
BY LA

TEST NO. 4 NAME A. F. Budge #2

24 hour leach on 20' ball mill grind with 10 lb/ton NaCN soln

Product	Weight	Assay Au	Assay Ag	Units Au	Units Ag	Distribution Au	Distribution Ag	
Leach Solution	1021.0	0.136	0.63	1.3886	6.432	81.76	20.68	V1C
Leach Residue	999.0	0.031	2.47	0.3097	24.675	18.24	79.32	
Head Calculated	1000.0	0.170	3.11	1.6983	31.108	100.00	100.00	
Total (Assay)		0.175	3.09					

OPERATION		BM		Start		Off
TIME		20'		8:31		8:31
REAGENTS - LBS PER TON				Leach		24 Hrs.
Ore	gm	1000				
Water	gm	1000				
Lime	gm		3.0			
NaCN	gm			5.0		
NaCN Titration, lb/ton soln						6.20
CaO Titration, lb/ton soln						0.6
NaCN Consumed, lb/ton ore						3.67
Lime Consumed, lb/ton ore						5.4
MACHINE						
R.P.M.						
pH		7.6	12.2			12.1
% SOLIDS						
TEMPERATURE						

REMARKS:

MESH	GRINDING PRODUCT Leach Residue %
+10	
+14	
+20	
+28	
+35	
+48	0.0
+65	0.0
+100	0.1
+150	1.8
+200	6.2
+325	20.1
-325	71.8
	100.0

DAWSON METALLURGICAL LABORATORIES, INC.

P. O. BOX 7685
5217 Major Street
Murray, Utah 84107-0685
Phone: 801-262-0922

PROJECT NO. P-1583C
DATE 12/19/88
BY LA

TEST NO. 5 NAME A. F. Budge #2

48 hour leach on 20' ball mill grind with 10 lb/ton NaCN soln

Product	Weight	Assay Au	Assay Ag	Units Au	Units Ag	Distribution Au	Distribution Ag	
Leach Solution	1016.5	0.139	0.67	1.4129	6.811	82.52	21.72	V1C
Leach Residue	997.5	0.030	2.46	0.2993	24.539	17.48	78.28	
Head Calculated	1000.0	0.171	3.13	1.7122	31.349	100.00	100.00	
Total (Assay)		0.175	3.09					

OPERATION		BM		Start		Off								GRINDING PRODUCT	
TIME		20'		8:57		8:57									
REAGENTS - LBS PER TON				Leach		48 Hrs.									
Ore	gm	1000											MESH	%	
Water	gm	1000											+ 10		
Lime	gm		3.0										+ 14		
NaCN	gm			5.0									+ 20		
NaCN Titration, lb/ton soln						6.46							+ 28		
CaO Titration, lb/ton soln						1.0							+ 35		
NaCN Consumed, lb/ton ore						3.43							+ 48		
Lime Consumed, lb/ton ore						5.0							+ 65		
													+ 100		
													+ 150		
MACHINE													+ 200		
R.P.M.													+ 325		
pH		7.6	11.9			11.8							-325		
% SOLIDS															
TEMPERATURE															

REMARKS:

DAWSON METALLURGICAL LABORATORIES, INC.

P. O. BOX 7685
5217 Major Street
Murray, Utah 84107-0685
Phone: 801-262-0922

PROJECT NO. P-1583C
DATE 12/19/88
BY LA

TEST NO. 6 NAME A. F. Budge #2

72 hour leach on 20' ball mill grind with 10 lb/ton NaCN soln

Product	Weight	Assay Au	Assay Ag	Units Au	Units Ag	Distribution Au	Distribution Ag	
Leach Solution	1022.2	0.143	0.67	1.4617	6.849	84.01	20.70	V1C
Leach Residue	993.8	0.028	2.64	0.2783	26.236	15.99	79.30	
Head Calculated	1000.0	0.174	3.31	1.7400	33.085	100.00	100.00	
Total (Assay)		0.175	3.09					

OPERATION		BM		Start		Off								GRINDING PRODUCT	
TIME		20'		9:40											
REAGENTS - LBS PER TON				Leach		72 Hrs.									
Ore	gm	1000											MESH	%	
Water	gm	1000											+10		
Lime	gm		3.0										+14		
NaCN	gm			5.0									+20		
NaCN Titration, lb/ton soln						6.37							+28		
CaO Titration, lb/ton soln						0.6							+35		
NaCN Consumed, lb/ton ore						3.49							+48		
Lime Consumed, lb/ton ore						5.4							+65		
													+100		
													+150		
MACHINE													+200		
R.P.M.													+325		
pH		7.6	11.9			11.9							-325		
% SOLIDS															
TEMPERATURE															

REMARKS:

ASSAY REPORT SHEET

ASSAY LAB, INC.
1376 W. 8040 So. Unit #4
West Jordan, Utah 84084

Date Received _____ Date Reported 12-20-88

Client Dawson Metallurgical Labs

Sample Identification	Oz / Ton Au	Oz / Ton Ag	Remarks
			* Ounces per ton of 2000 lbs.
P-1583C A.F.Budge Heads			
Head #1	.616	13.36	
	.617	13.36	
Head #2	.173	3.09	
	.177	3.08	

ASSAY REPORT SHEET

ASSAY LAB, INC.
1376 W. 8040 So. Unit #4
West Jordan, Utah 84084

Date Received _____ **Date Reported** 12-22-88

Client Dawson Metallurgical Labs

Sample Identification	Oz / Ton Au	Oz / Ton Ag	Remarks
			* Ounces per ton of 2000 lbs.
P-1583C A.F. Budge			
Leach Solns T-1 #1	.389	7.08	
	.389	7.08	
T-4 #2	.136	.63	
	.136	.63	
P-1583C Leach Residues			
T-1 #1	.267	6.33	
	.268	6.33	
T-4 #2	.030	2.47	
	.031	2.47	

Ronald Bianchi

ASSAY REPORT SHEET

ASSAY LAB, INC.
1376 W. 8040 So. Unit #4
West Jordan, Utah 84084

Date Received _____ Date Reported 12-27-88

Client Dawson Metallurgical Labs

Sample Identification	Oz / Ton Au	Oz / Ton Ag	Remarks
			* Ounces per ton of 2000 lbs.
P-1583C A.F. Budge			
Leach Residues			
T-2 #1	.259	6.65	
	.258	6.65	
T-5 #2	.031	2.46	
	.029	2.46	
T-3 #1	.286	2.38	
	.283	2.38	
	.286	2.38	
T-6 #2	.027	7.09	
	.028	7.10	
P-1583C Leach Solns			
T-2 #1	.402	6.87	
	.401	6.87	
T-3 #1	.378	6.54	
	.380	6.54	
T-5 #2	.138	.67	
	.139	.67	
T-6 #2	.143	.67	
	.142	.67	

Ronald Beaverson

DAWSON
METALLURGICAL
LABORATORIES, INC.

P.O. Box 7685
5217 Major Street
Murray, Utah 84107-0685
Phone: 801-262-0922

February 2, 1989

A. F. Budge Mining Ltd.
4301 North 75th Street
Suite 101
Scottsdale, Arizona 85251

Attention: Mr. Dale Allen
Ms. Carole O'Brien

Subject: Results of Continued Laboratory Testing on a High Grade Gold-Silver UVX Sample. Our Project No. P-1583C.

Gentlemen:

In accordance with discussions between Mr. Frank Millsaps and ourselves, laboratory test work was continued on a high grade gold-silver sample from the UVX Property identified as P-1583C Composite No. 1. A series of gravity concentration tests followed by bulk sulfide flotation of the gravity tailings and subsequent cyanidation of the flotation tailings was performed to determine gold and silver extraction. Specific test work performed included:

- Gravity concentration (hand-pan) of a ball mill ground sample followed by flotation of the gravity tailings.
- Gravity concentration (tabling) of a -35 mesh sample followed by flotation of the reground gravity tailings.
- Cyanidation of flotation tailings.
- Amalgamation of gravity and flotation concentrates.

Results of direct cyanidation tests on ball mill ground Composite No. 1, originally reported December 29, 1988, are also included in this report.

I. Sample Description And Head Analysis

A UVX sample, received at our laboratory December 15, 1988, and assigned our Lot No. P-1583C Composite No. 1 was used in this test work. This sample was described in our December 29, 1988, report to Mr. Allen and Ms. O'Brien.

Head assay results and back-calculated head assays from test work are presented below:

P-1583C: A. F. Budge Mining, Ltd.
Head Assay Results: Composite No. 1

	Head Assay, oz/Ton	
	Au	Ag
Assayed Head	0.617	13.36
Avg. Back-Calc. Head*	0.656	13.82

*Avg of 3 tests

The sample was a salmon pink color indicating the presence of iron oxides.

II. Test Results

Results presented in this section are also included in individual test data sheets attached to the end of this report.

A. Summary

Results indicate that slightly higher gold and silver extractions were obtained from this sample by a combination of gravity concentration, flotation, tailings regrind and cyanidation than by direct cyanidation. These results are summarized below:

P-1583C: A. F. Budge Mining Ltd.
Test Results Summary

Test No.	Description	Gold Assay, oz/Ton Residue	Gold Assay, oz/Ton Head	Gold Extracted, %
3	Direct Cyanidation	0.285	0.672	57.6
7, 8	Gravity, Flotation, Tails Cyanidation	0.298*	0.632	52.7
9, 9A	Gravity, Flotation, Reground Tails Cyanidation	0.208*	0.665	72.2

		Silver Assay, oz/Ton		Silver Extracted, %
		Residue	Head	
3	Direct Cyanidation	6.84	13.51	49.4
7, 8	Gravity, Flotation, Tails Cyanidation	7.38*	13.47	46.3
9, 9A	Gravity, Flotation, Reground Tails Cyanidation	5.54*	14.48	67.0

*Flotation Tailings Leach Residue

The increased gold and silver extraction obtained in the gravity-flotation concentration, reground tailings cyanidation flowscheme may not be economically justified due to the increased treatment cost. In addition, concentrate treatment will incur additional loss of precious metal.

B. Direct Ore Cyanidation

Cyanidation of whole ore samples ball mill ground to 92 percent minus 200 mesh extracted approximately 58 percent of the gold and 50 percent of the silver in 72 hours. Results are presented below:

P-1583C: A. F. Budge Mining, Ltd.
Whole Ore Cyanidation
- Test 3 -

Product	Assay, oz/Ton		Distribution, %	
	Au	Ag	Au	Ag
Solution	0.379	6.54	57.56	49.37
Residue	0.285	6.84	42.44	50.63
Total (Calc)	0.672	13.51	100.00	100.00

NaCN Consumed: 4.14 lb/ton ore
Lime Consumed: 4.1 lb/ton ore

These results were included in our December 29, 1988, report to Mr. Allen and Ms. O'Brien.

C. Gravity - Flotation Concentration

Approximately 40 - 45 percent of the gold and silver in the sample was recovered by gravity concentration followed by flotation. Less than ten (10) percent of the gold was recovered into gravity concentrates. These results are summarized below:

P-1583C: A. F. Budge Mining Ltd.
Gravity - Flotation Concentration

Test No.	Product	Weight %	Assay, oz/Ton Au	Assay, oz/Ton Ag	Distribution, % Au	Distribution, % Ag
7	Gravity Conc.	0.73	3.692	223.91	4.3	12.2
	Sulfide Ro. Conc.	0.87	23.008	410.56	31.6	26.5
	Oxide Ro. Conc.	0.64	2.446	22.42	2.5	1.1
	Oxide Ro. Tails	97.76	0.399	8.31	61.6	60.2
	Total	100.00	0.632	13.47	100.0	100.0
9	Gravity Conc.	2.93	1.909	165.27	8.4	33.4
	Sulfide Ro. Conc.	1.10	19.241	169.56	31.9	12.9
	Oxide Ro. Conc.	0.51	1.562	11.45	1.2	0.4
	Oxide Ro. Tails	95.47	0.408	8.08	58.5	53.3
	Total	100.00	0.665	14.48	100.0	100.0

Tests 7 and 9 were similar except that a gravity concentrate was produced in Test No. 7 by hand panning a ball mill ground sample, while the gravity concentrate in Test No. 9 was produced by tabling a sample crushed to 35 mesh. The table tailings were then reground prior to flotation.

Free gold, ranging in size from 35 to 400 mesh, was observed in the gravity concentrates, with only minor amounts of pyrite detected. Sulfide flotation concentrates contained much finer gold (200 mesh top size) with minor amounts of sulfides and semi-oxidized iron (Limonite). Malachite and azurite oxide copper minerals were detected in the oxide rougher concentrates.

D. Flotation Tailings Cyanidation

Cyanidation of flotation tailings indicated that gold and silver extraction increased significantly when the tailings were reground from 83 percent minus 200 mesh to 88 percent minus 400 mesh. Unfortunately the cyanide consumption increased drastically in the reground tails test. Results are summarized as follows:

P-1583C: A. F. Budge Mining Ltd.
Flotation Tailings Cyanidation

Test No.	Grind	Gold Assay, oz/Ton Residue	Gold Assay, oz/Ton Calc. Head*	Gold Extracted, %	Reagents Consumed lb/Ton Tails NaCN	Reagents Consumed lb/Ton Tails Lime
8	83.1% -200 M.	0.298	0.388	23.3	1.84	1.9
9A	87.9% -400 M.	0.208	0.438	52.5	20.5	2.5

		Silver Assay, oz/Ton Residue	Silver Assay, oz/Ton Calc. Head*	Silver Extracted, %
8	83.1% -200 M.	7.38	8.28	11.0
9A	87.9% -400 M.	5.54	8.95	38.1

*Flotation Tails

The leach solution from Regrind Test No. 9A contained 1180 ppm Fe and 136 ppm Cu. Based on these assays, approximately 13.4 lb NaCN per ton of tails was complexed as ferro-cyanide, while 0.5 lb NaCN per ton of tails was complexed as copper cyanide.

The use of cement instead of lime for pH control may reduce the cyanide consumption during cyanidation of reground flotation tailings.

E. Concentrate Amalgamation

The gravity and flotation concentrates from Test No. 9 were amalgamated to determine the amount of free gold and silver present. Results, summarized on the following page, indicate that almost 70 percent of the gold and 50 percent of the silver in the gravity (table) concentrate was amalgamated. Less than ten (10) percent of the gold and silver in the flotation concentrates was amalgamated.

P-1583C: A. F. Budge Mining Ltd.
Flotation Concentrate Amalgamation
- Test 9 -

Product	Gold Assay, oz/Ton		Gold Recovered By Amalgamation, %
	Amalgam Feed	Amalgam Tails	
Table Conc.	1.909	0.609	68.1
Sulfide Flot. Conc.	19.241	17.494	9.1
Oxide Flot. Conc.	1.562	1.539	1.5

	Silver Assay, oz/Ton		Silver Recovered By Amalgamation, %
	Amalgam Feed	Amalgam Tails	
Table Conc.	165.27	85.83	48.1
Sulfide Flot. Conc.	169.56	165.73	2.3
Oxide Flot. Conc.	11.45	11.41	0.4

III. Test Procedures

Procedures summarized in this section are also described in individual test data sheets attached to the end of this report.

A. Direct Ore Cyanidation

Test procedure was described in our report of December 29, 1988 (re: P-1583C).

B. Gravity - Flotation Concentration

The hand-pan gravity concentration test (No. 7) was performed as follows: 1000 grams of minus 20 mesh sample was ball mill ground to 83 percent minus 200 mesh and hand-panned using a small gold pan followed by a vanning plaque. The gravity tailings were transferred to a 1000 gram "Agitair" flotation machine and conditioned for five minutes with 0.10 lb/ton A-208 promoter and 0.03 lb/ton A-350 (potassium Amyl Xanthate). A rougher concentrate was subsequently floated for three minutes. Rougher tailings were conditioned five minutes with 0.5 lb/ton $CuSO_4$ and 0.05 lb/ton A-350 and a second rougher floated for one minute. These rougher concentrates were combined prior to filtering and drying.

The sulfide flotation tails were conditioned for eight minutes with 0.35 lb/ton NaHS (sulfidizing reagent) and 0.10 lb/ton A-350 prior to four minutes flotation. An MIBC-F65 frother mixture was used as required to maintain a stable froth. Flotation reagents used in these tests are manufactured by Cyanamid Corporation.

The table gravity concentration test (No. 8) was performed by tabling four kilograms of minus 35 mesh sample on an eighth deck Deister concentrating table. The table tailings were settled, clear water decanted, and the table tails were reground to 75 percent minus 200 mesh and floated as described earlier.

C. Flotation Tailings Cyanidation

Four hundred grams of dried flotation tailings from Test No. 7 was mixed with an equal weight of water and the pH adjusted to 11.5 with hydrated lime. Sodium cyanide was added to provide an initial solution concentration of ten lb/ton, and the slurry was bottle roll leached for 72 hours.

A second tailings cyanidation test was performed as follows: one kilogram of dried flotation tailings from Test No. 8 was reground in a ball mill to 88 percent minus 400 mesh. The slurry was adjusted to pH 12 with hydrated lime and cyanide was added to provide an initial solution concentration of 20 lb/ton. The slurry was subsequently bottle roll leached at 50 percent solids for 72 hours. The cyanide concentration was reconstituted to 20 lb/ton of solution after 24 hours of leaching.

D. Concentrate Amalgamation

Table, sulfide rougher, and oxide rougher concentrates from Test No. 9 were amalgamated separately as follows: each concentrate was diluted to approximately 10 - 15 percent solids and 25 grams of clean mercury added. A small amount (1.0 - 0.5 grams) of NaOH was added and the slurry was bottle rolled for four hours. The loaded amalgam was then separated from the sample by careful hand panning.

If you have any questions or we can be of further service, please call.

Sincerely,

DAWSON METALLURGICAL LABORATORIES, INC.

Philip Thompson
Vice President

PT/fg

cc: Mr. Frank Millsaps
Millsaps Mineral Service

A.F. Budge (Mining) Limited

To: Anthony F. Budge

Date: August 27, 1990

From: Carole A. O'Brien

Copies: Ronald R. Short
Dale H. Allen
John W. Norby

Subject: Monthly Report - July

U.V.X.

The July forecast for production was 2,772 tons of material grading 0.46 oz/ton gold and 1.23 oz/ton silver; associated costs for the project were projected at $205,852, with gold prices at $360 per ounce and silver prices at $4.85 per ounce, revenues of $328,209 were expected, and an operating profit of $122,357.

Total ore hoisted at the U.V.X. for the month was 3,669 tons; car sampling indicated a grade of 0.293 oz/ton gold and 1.10 oz/ton silver. Shipments to Hidalgo totalled 3,362 tons averaging 0.311 oz/ton gold and 1.82 oz/ton silver for a total of 1,044.8 ounces of gold, 6,133.3 ounces of silver and revenues of $341,983.84. Total costs accrued for July are $261,866.49 which included a payment of $49,406.54 to Verde Exploration Limited.

An overall operating profit of $80,117.35 was realized.

U.V.X. Exploration

Drilling continued in July and results of this drilling are detailed in a separate memo from John Norby/John McKenney, dated August 22, 1990.

Expenditures during July, estimated at $55,000, were $33,138.14 for drilling, assays and support geologist. The invoice for bit charges during the month has not been received as of this date.

Vulture:

No production had been estimated for July from the Vulture, however, during the detoxification of the heap, we have recovered a few ounces of gold and silver. The dore bars are awaiting shipment to GD Resources for final processing. These bars will be taken to Reno in September en route to the Gold Tech conference scheduled September 10 through 12.

Expenses during July at Vulture were $11,417.43. Revenues are expected to be in the $4,000 to $5,000 range for the month.

Korn Kob

Projected expenditures at Korn Kob in June were estimated at $62,500 which was to include computer studies, the staking of

additional claims, continuing environmental studies and metallurgical test work. Also included was the pre-feasibility study prepared by Roberts & Schaefer, at a cost of $31,950.

Actual expenditures accrued are $76,857.74. The overall capital costs estimated for the project by Roberts & Schaefer and the mining costs estimated by Derry, Michener, Booth & Wahl were considered disproportionately high. The study was sent in August to Brown & Root U.S.A. Inc. for audit. This audit is expected to cost approximately $5,000.

Other and Miscellaneous

Actual expenditures accrued for July are $504,870.45.

August Projections

U.V.X.: Considering production statistics to date, the April forecast of 3,036 tons of 0.46 oz/ton gold and 1.23 oz/ton silver has been revised to 3,036 tons of 0.34 oz/ton gold and 1.23 oz/ton silver. This more accurately reflects car sampling to date. Based on $395 gold and $4.85 silver, revenues are estimated at $358,824.76; associated costs at $212,520; profits at $146,305.

Vulture: No production had been estimated for August from the Vulture. Expenses are estimated at $12,000.

Korn Kob: No major activities have been planned for the Korn Kob project except for (1) the mapping of the North Pit area and (2) the continuing water studies which are part of the on-going environmental work of Dames & Moore.

Total estimated expenditures for August are projected at $416,520. As of August 24, $114,921.30 has been expensed. Of the $358,825 in revenues expected from Phelps Dodge, $146,365 has been received.