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Arizona Geological Survey
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Tucson, Arizona 85701
520-770-3500
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James Doyle Sell Mining Collection

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PRELIMINARY REPORT

RENO: 1500 Glendale Ave,SPARKS 89431
P.O. Box 71060, RENO 89570
Ph (702)356 0606 Fax 3561413

AMERICAN ASSAY LABORATORIES

REPORT : SP 013930 1 Page(s) Date : 09/23/91

Client reference : M-1/3 Project : MONARCH

Cost code :

Copies to : J.D. SELL

Samples : Type Preparation code
Received : 09/19/91 ----------

Analysis	Code	Quality Parameter	Detection	Units
Au	FA30	Acc. 15 %	5	ppb
Au(R)	FA30	Acc. 15 %	5	ppb

ASARCO Inc.
SEP 23 1991
SW Exploration

Signatory : Jorge Ugarte

PRELIMINARY REPORT

REPORT : SP 013930

Sample	Au ppb	Au(R) ppb	
M-1	24	22	
M-2	12	16	
M-3	2628	2623	±0.07 oz

Please refer to the cover sheet for further analysis details.

PRELIMINARY REPORT

ASARCO Exploration

SEP 2 7 1991

SW Exploration

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Analysis	Code	Quality Parameter	Detection	Units
Au	FA30	Acc. 15 %	5	ppb
Au(R)	FA30	Acc. 15 %	5	ppb
Ag	D210	Prec.10 %	0.5	ppm
Cu	D210	Prec.10 %	2	ppm

Signatory : Jorge Ugarte

PRELIMINARY REPORT

REPORT : SP 013930

Sample	Au ppb	Au(R) ppb	Ag ppm	Cu ppm
M-1	24	22	<0.5	4090
M-2	12	16	<0.5	1950
M-3	2628	2623	1.2	9760

Please refer to the cover sheet for further analysis details.

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Please refer to the cover sheet for further analysis details.

ANALYSIS REPORT

ASARCO Incorp.
OCT 4 1991
SW Exploration

American Assay Laboratories

REPORT : SP 013930

Sample	Au ppb	Au(R) ppb	Ag ppm	Cu ppm
M-1	24	22	<0.5	4090
M-2	12	16	<0.5	1950
M-3	2628	2623	1.2	9760

Please refer to the cover sheet for further analysis details.

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American Assay Laboratories

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P.O. Box 71060, RENO 89570
Ph (702)356 0606 Fax 3561413

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REPORT : SP 013930 1 Page(s) Date : 09/27/91

Client reference : M-1/3 Project : MONARCH

Cost code :

Copies to : J.D. SELL

ASARCO Inc.
OCT 4 1991
SW Exploration

Samples : Type Preparation code
Received : 09/19/91

Analysis	Code	Quality Parameter	Detection	Units
Au	FA30	Acc. 15 %	5	ppb
Au(R)	FA30	Acc. 15 %	5	ppb
Ag	D210	Prec.10 %	0.5	ppm
Cu	D210	Prec.10 %	2	ppm

Signatory : Jorge Ugarte

American Assay Laboratories

INVOICE

Remit To: P.O. Box 71060
Reno, NV 89570
Phone No.: 702-356-0606
Fax No.: 702-356-1413

AMERICAN ASSAY LABORATORIES
P. O. BOX 71060
RENO, NV 89570

(702) 356-0606

INVOICE NO: SP 001930-IN
INVOICE DATE: 09/30/91

INVOICE TO:
JAMES D. SELL, SWED
ASARCO INCORPORATED
P. O. BOX 5747
TUCSON AZ 85703

ASARCO, INC.
P. O. BOX 5747
TUCSON AZ 85703

CUSTOMER P.O.	PROJECT	TERMS
	MONARCH	NET 30

QUANTITY	DESCRIPTION	PRICE	AMOUNT
3	SAMPLES RECEIVED	.00	.00
3	SPLITTING CHARGE	.50	1.50
3	KEEGOR MILLING CHARGE	2.00	6.00
3	Au (1 A.T. FIRE ASSAY)	7.25	21.75
3	HYDROCHLORIC/NITRIC DIGESTION	2.00	6.00
3	Ag ANALYSES	.80	2.40
3	Cu ANALYSES	.80	2.40

ASARCO Incorporated
OCT 4 1991
SW Exploration

NET INVOICE:	40.05
LESS DISCOUNT:	.00
FREIGHT:	.00
INVOICE TOTAL:	40.05

James D Sell
Tucson General
Monarch Mine

Figure 1.
Monarch Mine

TES
E INTERIOR
URVEY

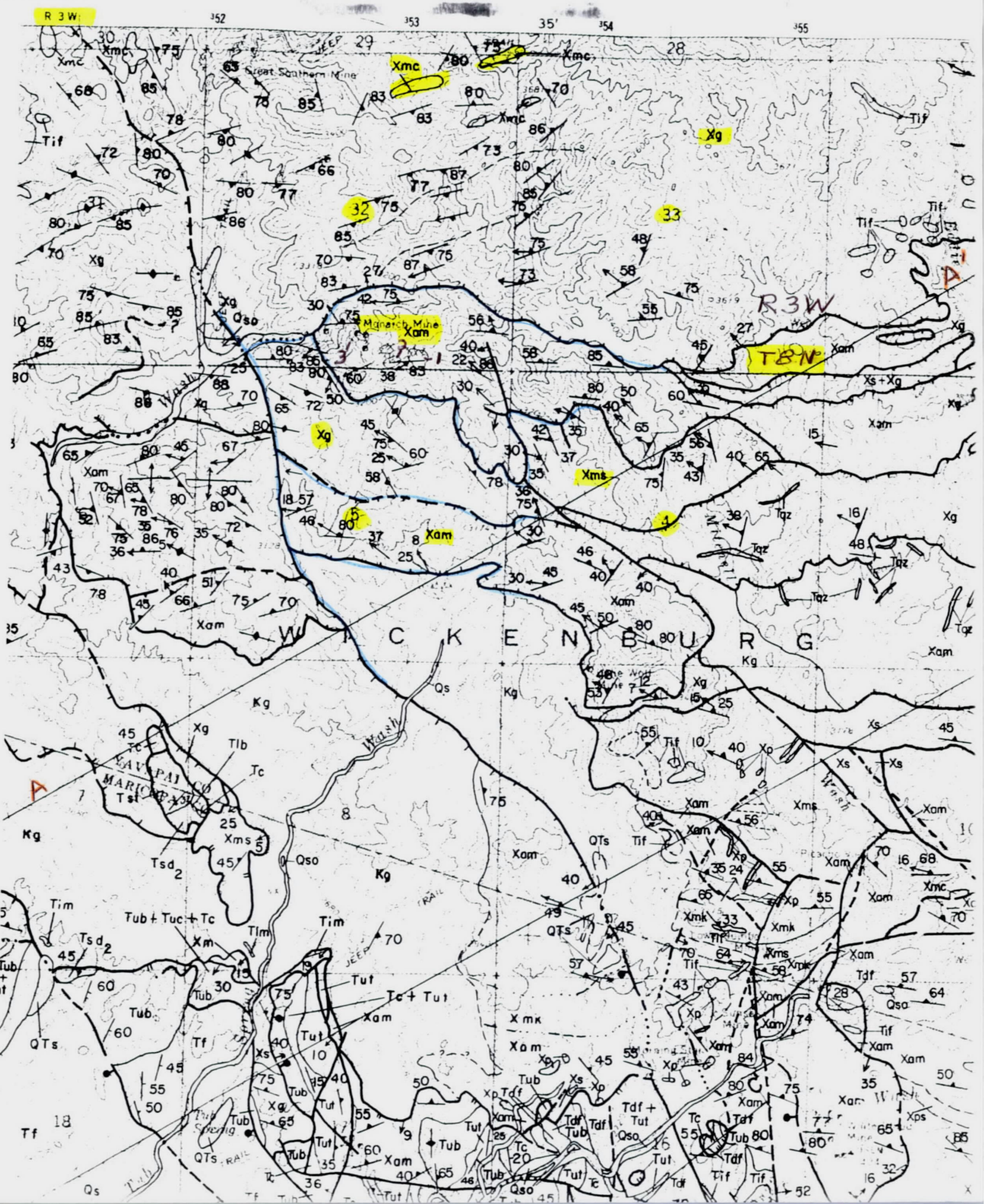


FIGURE 1.

Monarch Mine Area
Sec. 32, T8N, R3W
Red Picacho 7½' Quad.
Yavapai County, AZ
AGS OFR 87-9

JDS 10-7-91

ANALYSIS REPORT

ASARCO Incorp.

OCT 4 1991

SW Exploration

American Assay Laboratories

0 6 3

REPORT : SP 013930

Sample	Au ppb	Au(R) ppb	Ag ppm	Cu ppm
M-1	24	22	<0.5	4090 = 0.41 %
M-2	12	16	<0.5	1950 = 0.20 %
M-3	2628 *	2623 *	1.2	9760 = 0.98 %

Please refer to the cover sheet for further analysis details.

$\frac{2628}{34,286}$ = 0.077 opt Au

Dr. Mr. Henry Valentine ← Pat Brown 9/10/91 telephone.
% 602/684-7760
Wickenburg, AZ
otherwise 305/374-1551, Miami, Florida.

1972
Sec 32
T Secs 7-8 N
R3W

The Monarch Mine Black Rock Dist, Yavapai Co
working with Jerry Withers White Picacho Dist.
Harvey Smith
Gordon ~~Wetterwalt~~ Wiederwilt (326-8619)
(IP anomaly)

Has drilled 3 core holes 150'-200' deep
with some assays of 0.4 Cu + 0.04 Au.
7 pat. claims, 117 unpat. = 123 claims total.

Meet him at 10 AM
Country Kitchen
Wickenburg.

Humboldt Smelter Au 0.94, Ag 1.1, Cu 11.96 etc. hi-grade pod.
Qtz Vn dips flatly at 14° W., exposed for 2000'. between diorite and gneissic rock. strikes N 45° dips 14° west.

J. C. Edwards, President Jumbo Copper Co. Macon, Georgia June 1926
Dr. J.T. Ross

ck AZGS
ck W 7½

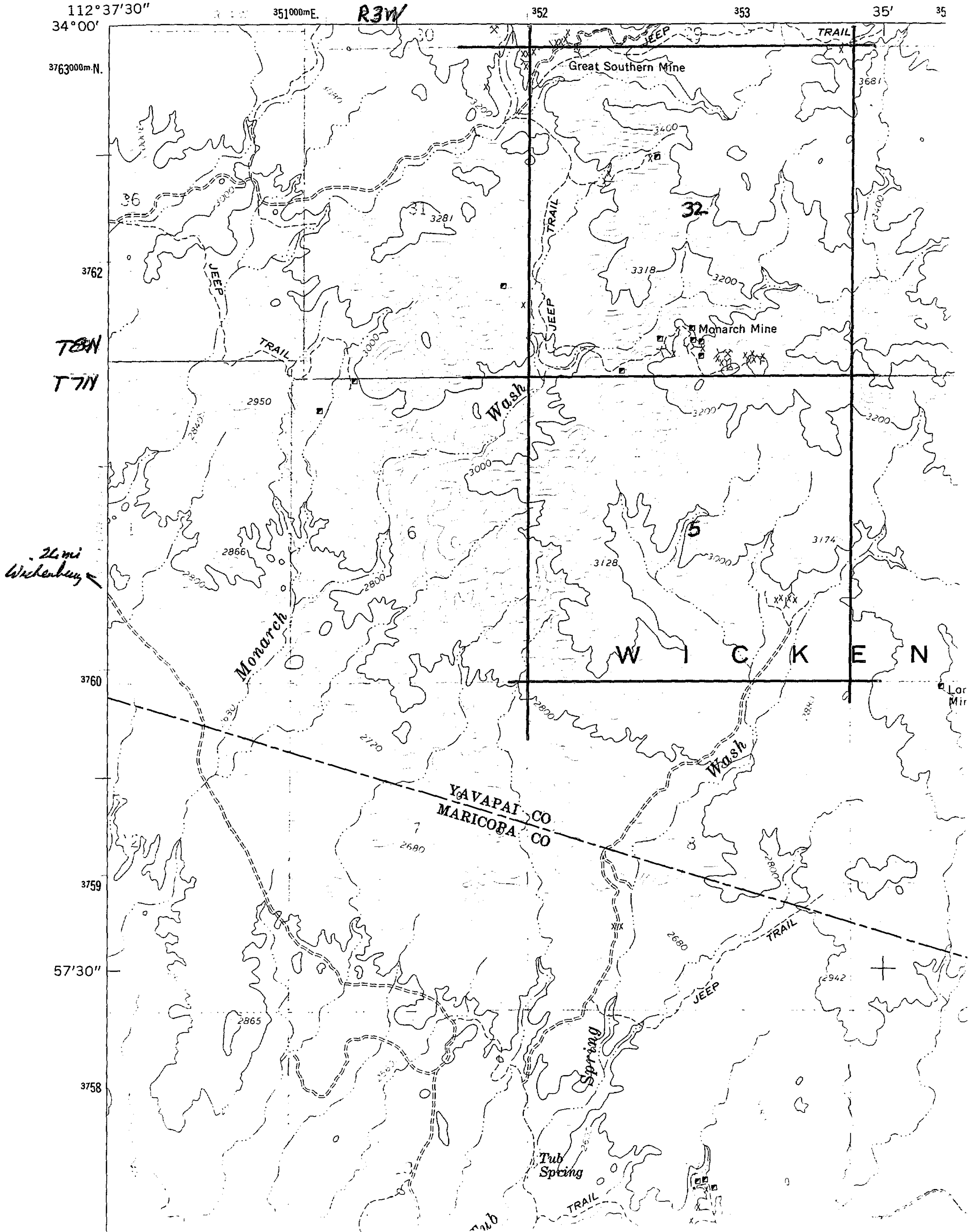
Monarch Mine
Yavapai Co. AZ

Sec. 5, T7N, R3W
Sec. 32, T8N, R3W

MONARCH MINE

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Red Picacho 7½ min



August 31, 1942

Dr. Jas. T. Ross
363 College Street
Macon, Georgia

Monarch
~~JUMBO~~ MINE
~~MONARCH MNG & SMELTING CO.~~ Jumbo Copper Co.
YAVAPAI COUNTY, ARIZ.
~~WICKENBURG~~

Dear Sir:

We are in receipt of your two letters, under date of July 30th, addressed to our Leadville and Hayden plants and which have been referred to this department for handling.

We are entirely familiar with the Jumbo Mine which our engineers have examined. We regret to advise that it is not the type of property in which our company would be interested.

We thank you, however, for your consideration in bringing it to our attention.

Yours very truly,

F. M. STEPHENS

cc: WHLoerpabel
FMS/ap

MJ-14

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
MINE OWNER'S REPORT

Date: June 16, 1942

1. Mine: The Jumbo Copper Co.

2. Location: 10½ mi. by public road east of Wickenburg, in three Mts. called the Three Black Buttes. Wickenburg is on A.T.&S.F.R.R., 54 mi. N. of Phoenix

3. Mining District & County: White Picacho Mining Dist.

4. Former name: Monarch Mining & Smelting Co.

5. Owner: Jumbo Copper Co.

6. Address (Owner) Dr. Jas. T. Ross, 363 College St., Macon, Ga.

7. Operator: Not in operation

8. Address (Operator) Communicate with Dr. Ross

9. President, Owning Co.: J.C. Edwards, who is ill. Dr. Ross is acting Pres.

9A. Present Operating Co.: Not in operation

10. General Mgr.

11. Mine Supt.

12. Mill Supt.

13. Men Employed

14. Principal Minerals: Copper, gold, silver, iron, lime and sulphur.

15. Production Rate

16. Mill- Type & Cap. All Equipment sold.

17. Power - Amt. & Type.

18. Operations - Present:

19. Operations - Planned: Wish to lease or sell.

20. Number Claims, Title, etc.: Claims patented aggregate 94.46 acres. They are Hazel, Sulphuretts, Luck Sure, Carthage, Denver, Washington. Described in U.S. Patent Office, Co. Recorder, Yavapai Co., Ariz. Book 95, of Deeds, pp. 386-397. Own Robley D. Evans Mill Site and Water Right. Spring for domestic purpose and five acres recorded in same office. Pipe line also laid under authority of U. S. permit from pumping station on Hassayampa River bed. This is eight miles from property. Am inclosing map.

21. Description - Topography and Geography: Rugged - Three Black Buttes, Hassayampa River bed eight miles away.

22. Mine Workings - Amt. & Condition: Tunnels in rather bad condition. Following work has been done. On west slope tunnel 5' by 8' goes 488' east, then S.E. 102' toward shaft #5, which was timbered to depth of 510'. Several cross-cuts on main tunnel. Upraise #1-118' - #2-128'. Cross-cuts 35', 9 shafts 174' altogether. Shaft #9-168'. 4 short tunnels and 4 short cuts 145' altogether. Tunnel on N.E. slope extends 345'. One lateral 84' connects with rattlesnake shaft 34' from surface. Three cross cuts on it and one winze.

23. Geology & Mineralization: "Matrix of ore of vein diorite with admixture of qu··tz. The metallic value consists of copper, bornite and chalcopyrite, gold and a li le silver. Ore from 10' drift was clean cut sulphide...I am satisfied it is an index to value and character of ore which will be encountered in main vein. Ore exposed to oxidation contained 4½% copper "Report by Alex. Spotswood, A.I.M.E. Also some peacock ore found.

24. Ore - Positive & Probable, Ore Dumps, Tailings: From report of Humboldt smelter gold - .94 oz./ton, silver - 1.1 oz./ton, copper - 11.96%, insoluble - 25%, iron - 30.70%, lime - 1.1%, sulphur - 13.36%. Informed by a friend, a mining engineer, most high grade ore has been removed. Large amount of low grade ore is still on dumps. We have a few samples of ore which we can send if wanted. Picked up at random.

24A. Dimensions and value of ore body: The general vein system can be traced for a distance of over three thousand feet. Several veins traverse the property and show the same geological characteristics, but vary in size from one to twenty-five feet. There is reason to hope and expect that several parallel veins referred to will converbe with depth, and thus increase the size of the ore body. Spotswood.

25. Mine, Mill Equipment & Flow-sheet: All machinery and mine equipment was sold.

26. Road Conditions, Route: Had splendid road over which cars and trucks ran daily. Road can still be traveled but is in bad condition.

27. Water Supply: Shaft 130' deep - use as source of water supply for general use. One well at dam in gulch - 26' deep, full. One well, one-half mile up canyon - 53' deep 4' water, another at camp in front of stables - 78' deep - 50' of water, one spring for drinking and cooking. Pumping station on river bed eight miles away and pipe line from it to property.

28. Mr. Rylander discovered these claims and made his living for years on them. After his death his widow sold the claims to men who organized the Monarch Mining & Smelting Co. They sold stock in different parts of the U.S. Georgia men obtained controlling interest, and Dr. J. T. Ross was elected president. Slow progress made. Mine finally well equipped. First freeze in years broke pipe line. Capital all spent; compelled to close down. Machinery since sold.

29. Special problems, Reports filed: Poor management, incompetent engineer, development work ill-advised, and lack of funds.

30. Remarks: All who have examined the mine feel that those who can develop the mine will be much more than amply repaid. Even the miners bought stock in the mine when it was available to them.

31. If property for sale - Price, terms and address to negotiate: The property is for sale or lease. Terms to be agreed upon. Address Dr. James T. Ross, 363 College St., Macon, Georgia.

32. Signature _____

J. C. EDWARDS, PRESIDENT
DR. JAS. T. ROSS, VICE-PRESIDENT

C. L. TINSLEY, SECRETARY AND TREASURER
MACON, GA.

Jumbo

JUMBO COPPER COMPANY

AUTHORIZED CAPITAL $300,000

MINE: WICKINGBURG, ARIZONA

DIRECTORS

C EDWARDS, MACON, GA.
J. T. ROSS, VICE-PRESIDENT, MACON, GA.
W. O. DONOVAN, VIDALIA, GA.
FRANCIS HERRING, MACON, GA.
HARRY GARDEN, MACON, GA.
T. L. FUNDERBURKE, MACON, GA.
C. L. TINSLEY, MACON, GA.

Macon, Ga., June 26, 1926.

Mr. J. Kruttschnitt, Jr.,
Mgr., Amer. Smelting & Refg. Co.,
Tucson, Ariz.

Dear Sir:-

This is to acknowledge your letter of June 14th, and to thank you for your trouble of investigating our property.

We regret your advice that our property is not of a type that would interest your Company.

Yours truly,
Jumbo Copper Co.,
J. C. Edwards
President.

Report of Supplemental Examination
of
MONARCH MINE of JUMBO COPPER CO.,
Wickenburg, Yavapai Co.,
Ariz.

Wickenburg, Ariz., May 27, 1926.

Mr. J Kruttschnitt, Jr.,
AS&R Co., Tucson, Ariz.

Dear Sir:

I examined the Monarch property more thoroly on Monday, taking samples representative of the vein, ore dumps, and ore in the mill bin. The vein has a greater length than I thought, being exposed along its strike for about 1200 ft. The width of the vein varies from 5 ft. to 18 ft., averaging about 9 ft. The length of assured vein down the dip is at least 2000 ft.

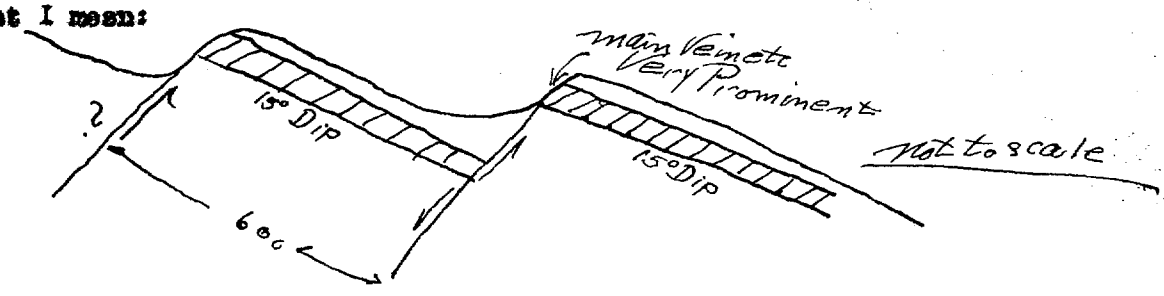
The character of the ore in the outcrop and the vein is similar in that both contain primary sulfides (Chalcopyrite), differing only in that the outcrop ore contains minor amounts of malachite - a product of direct oxidation of the chalcopyrite in place with no migration of the copper in solution.

The samples of the ore dumps were taken as chips from the ore broken and piled in large masses at the open cuts and tunnels. This sample is representative of the tenor of at least 2500 tons of ore. This ore can be reached by trams (tracks are nearly all inplace) on various cuts on the hillside and can be trammed about 400 ft. to a winze to a tunnel thru which the ore is trammed to the mill.

In order to determine the quality of the ore they were turning thru the mill, I took a sample of the material in the bin and in the chute below the grizzly.

The vein sample is representative of the tenor of the primary ore that would be obtained in any mining operations.

About 600 ft. to the east of the main outcrop is another outcrop with the same strike and dip, but with only about 400 ft. length. This vein outcrops at a higher point and apparently dips under the main vein, but as the two hills are joined by a saddle I presume there is a fault at this point and that they are the same vein. The following sketch will illustrate what I mean:



The machinery on the property seems to be in excellent shape, is kept oiled, and the moving parts are turned daily by the watchman.

The samples were sent to Hayden to be assayed and results are shown below:

Sample No.8 Ore dumps, representing about 2500 tons of broken ore.
Au. .01 Oz., Ag. .10 Oz., Cu. 1.60%
Sample No.9, Vein, Representative of primary ore. Au. .01, Ag. .05, Cu. 0.7%
Sample No.10 Ore from Mill Bin and fines from Grizzly:
Au. .02 Oz., Ag. .06 Oz., Cu. .90%.

Yours truly,
Henry Mulryan

The same minerals are found in the vein at the highest point and at 2,000 ft. down the dip.

The mining operations have been poorly carried on. The top of the hill where the vein outcrops is a mass of trenches and open cuts as shown on the map. About 500 ft. down the dip is the vertical shaft mentioned in the report submitted which is not timbered and has no head-frame. About 300' to the north is an incline shaft 360ft deep on about an 18 deg. dip. The vein does not flatten as claimed, but the shaft was sunk at too great an angle and passed into the footwall. There is good equipment in the hoist house. Why the vertical shaft was sunk 516 ft. is more than I can understand, because of the very flat dip of the vein, and the fact that the vein outcrops in the arroyo below the millsite and would have given greater depth.

The vein might well stand a sampling, because if the chief primary mineral is chalcopyrite there is considerable scattered thru the quartz.

This mine is known locally as the Monarch Mine and lies due east of Wickenburg about eight miles. It is reached by a good wagon road eleven miles in length. It is situated about one mile southeast of George Koyk's Diamond Joe Mine, with which you are familiar thru Mr. Beals and myself.

Yours truly,

Henry Mulryan

JUMBO COPPER COMPANY
Monarch Mine
Wickenburg, Yavapai County, Arizona.

Wickenburg, Ariz., May 4, 1926.

Mr. J. Kruttschnitt, Jr.,
Tucson, Arizona.

Dear Sir:

According to your request of April 26th, I made a preliminary examination of the Jumbo Copper Company's property near Wickenburg, Arizona.

Summary and Conclusion.

The Monarch vein is quite strong and has a consistent strike and dip. The vein system mentioned is merely the same vein (I think this could be proved easily by geological survey). The machinery mentioned in the report of Mr. Spotswood is in good condition. There are jackhammers and all small tools necessary for operation. The previous mining has been haphazard and futile. The vein is hard, glassy quartz, and contains primary copper sulphide (chalcopyrite) with some pyrite at the surface with no change in character down the dip for 2,000 ft. There is little or no oxidation and hence I do not believe any secondary zone of consequence would be encountered at the water level.

The vein outcrops on the top of a hill, forms a prominent cliff, and is exposed along its strike for about 500 ft. It dips flatly at 14 deg. to the west which would bring it thru to a point about 1,000 ft. west of the mill. It is exposed for about 2,000 ft. by erosion, open cuts, and tunnels. The vein is so hard that it has been resistant to erosion and hence forms the slope of the hill from the first point mentioned to below the cookhouse.

The vein consists of a hard, glassy quartz contained in a dark dike whose upper part is dense textured and whose lower part is between a diorite and a gneissic rock The hanging-wall is a slickensided face, while the footwall is not distinct, the vein and values grading into this material. There is no gouge. The strike of the vein is N. 45 deg. and the dip is 14 deg. westerly. The dip is consistent for 2,000 ft., where it enters the wash and is covered. The vein does not cross the wash in which the cookhouse and the well mentioned are situated. I believe this arroyo to be due to a fault zone, the fault having cut off the vein in its northern extension.

From my examination, I believe there is but one vein dipping at the angle mentioned. Local faulting and erosion gives the impression that there are several veins.

The minerals contained are chalcopyrite (altho I find it rather light in color where fresh) and pyrite. There is no bornite that I could find, but there is considerable tarnished chalcopyrite that might lead many to think this bornite. The tenor of the ore can be obtained by sampling only, unless you have data on this matter. I obtained specimen samples only, which I am sending to you.

There is little or no oxidation, the primary sulphides outcropping right on the surface. I should not therefore expect to find a secondary zone.

FEDERAL MINING AND SMELTING COMPANY

BAXTER SPRINGS, KANSAS

FREDERI[illegible] [illegible]URBIDGE, GENERAL MANAGER
P. W. GE[illegible] [illegible] SUPERINTENDENT
A. T. ST. [illegible] [illegible]IR, PURCHASING AGENT

April 27, 1926

Jumbo Copper Co.
Wickenburg - Yavapai Co. Ariz

Mr. J. Kruttschnitt, Jr.
American Smelting and Refining Company
Tuscon, Arizona

Dear Sir:

I am enclosing some correspondence with the Jumbo Copper Company, which has a property near Wickenburg, Arizona, and also a letter from a miner in Goldfield, Nevada, regarding lead mines in Mexico. If these letters should be of any interest to you, please write directly to the people in question as the properties are somewhat out of our district and line of business.

Yours very truly,

P. W. George

PWG:SA

P. W. George.

REPORT ON THE PROPERTY OF THE

JUMBO COPPER CO.

The Jumbo Copper Co. is situated in the southern part of Yavapai County, Arizona, about ten miles northeasterly from the town of Wickenburg, which is on the Sante Fe Railroad, An auto road connects the mine with Wickenburg. The property consists of nine claims, approximately 220 acres. Six of the claims are patented, and three are held by virtue of mineral location. On the patented claims is situated the most valuable portion of the mineralized area of this property, as well as practically all of the surface improvements, and underground development,

The general vein system can be traced for a distance of over three thousand feet showing evidences of mineralization wherever the outcrop is exposed. Several veins traverse the property, generally parallel, and show the same geologic characteristic, but varying in size from one to twenty-five feet in width. The most valuable pat of the mineralized acreage is called the main vein, and it has been on the surface outcroppings on this main vein that most of the development work in the past has been done. There is reason to hope and expect that the several parallel veins referred to will converge with depth, and thus increases the size of the ore body, Unless otherwise mentioned all references in this report refer to the main vein.

The gengue (matrix of the ore) of the vein consists of diorite with some mixture of quartz. The metalic values consist of copper gold and a little silver. The following copper ores are noted: Bornite and chalcopyrite.

On the northern part of the patented area the vein has been broken up to a very considerable degree. Over this part of the property the vein lies in a nearly horizontal plane covered by an overburden of a few feet. At this point local disturbances have so cracked and destroyed the vein and the surrounding country rock that it is difficult and often impossible to trace the vein and the country rock. Southwesterly from this disturbed area, the vein assumes a regular form, having an average width of five feet and dipping into the ground a little to the north of west at an angle of fifteen degrees. The hanging wall of the vein is well defined, and there is evidence of plane faulting as shown by its smooth surface and the presence of a gouge between the hanging wall side of the vein and the country rock. In most places where the foot wall is exposed it, gouge, is not so well defined, but in some places it appears to possess the same characteristics as the hanging wall. This leads me to conclude that should the vein be sunk on that hope that the vein and its metalic value will be found to be persentent to a considerable depth.

The past underground development has been ill advised. Practically all of the mining has consisted in removing the vein matter from places in the disturbed area by means of open cuts and short tunnels all at or very near the surface. That is to say practically all of the mining in the past has been surface work. The underground mineralized area has been to all practical purposes untouched.

The last work done by the former Management consisted in the sinking of a vertical shaft at a point where it would be impossible to encounter the main vein or its dip. At this time the attention and resources of the former operators were diverted to another mine, and operations were suspended.

However at the 246 foot level of this vertical shaft a vein was encountered. A drift was run in for 10 feet on this vein. Water in the shaft prevents me from taking a sample from that drift. I am informed that the vein matter at the end of that drift was 43 inches wide, and that the width was increasing as the drift was pushed ahead. Ore removed from that drift was piled up near the cellar of the shaft. The best part of this ore was shipped away at the time of its removal. Since then that pile of ore has been picked over many times, and portions removed. I took an average sample from what remained of the ore that was taken from that drift at the 246 foot level of the vertical shaft and the returns from the Assayer show 8.6% copper and $2.06 in gold. Under the circumstances, I am satisfied that these values are below the average values of the ore from that drift.

The ore from the ten foot drift mentioned was a clean cut sulphide. I attach a great deal of significance to the character and value of the ore that was taken from that ten foot drift. I am satisfied that the form of the ore and the values found in the ore at this place is a good index to the character and value of the ore which we will encounter when the main vein is exposed at depth.

Taking into consideration the fact that in the undisturbed zone all of the veins dip at approximately the same angle, it would be reasonable to expect that at depth following the dip of the vein of not more than 400 feet we should reach the water level and encounter the same character of ore that was found in the 246 foot level of the vertical shaft. I base my estimate of not more than 400 feet on my plan to put down an incline shaft following the dip of the vein at a point on the outcrop of the main vein about 100 feet lower than the collar of the vertical shaft.

Practically all of the ore mined in the past at this mine has been taken from open cuts and short tunnels in the disturbed area where the vein lies close to and horzontally with the surface. As might be expected this portion of the vein having been exposed to the action of oxidizing agencies a large portion of its original valuew has been leached out, and all of such ore is either oxidized or semi-oxidized. That portion of the ore so mined that contains a larger percentage of sulphide was treated in the Mill and the residue was stacked up in piles close to where it was removed. There are about 8000 tons of ore in these several dumps.

The former Management sampled the dumps mentioned in the foregoing paragraph and found that the copper content averaged 4½%. I have no record of the gold values in these dumps. With the present Mill equipment, it would not be possible to recover values from the ores in these dumps. However, I think that it would be possible by the addition of flotation equipment to our Mill to recover the vlues in these large accumulations of oxidized and semi-oxidized ores. This would also be applicable to ores that we will take out above the water (sulphide) level. It should be to the advantage of the Company to have a test on a few tons made so as to determine the applicability of the flotation method to effect a recovery on oxidized, semi-oxidized as well as on sulphide ores.

The Mill owned by this Company is located on its patented ground and is in an excellent state of preservation. It was not operated for any great length of time, and since the Mill shut down its equipment has been well taken care of. The equipment in the mill is such as is seen in plants where water concentrating is the effective method. I have never seen the Mill in operation. I learned from memoranda left by the former Management that its capacity per 24 hours is approximately 160 tons. ~~From that with its capacity for 24 hours~~ From my examination of the equipment, I believe that the foregoing is approximately correct. The Mill with its present equipment is designed to treat sulphide ores. Undoubtedly one of the important reasons that contributed to the lack of

success of the former Management was the fact they were unwise enough to believe that the values in semi-oxidized ores could be saved by a method involving simple water concentration.

The power to operate the Mill is supplied by a 100 h.p. diesel engine, and a 12 hp Fairbanks-Morse engine, both consuming gasoline. The remainder of the Mill equipment is as follows:

1 - 2 tontrack scale.
1 - 8' griarly with 1" openings (undersize to crusher bin, oversize to crusher)
1 - 11x15" Dodge jam crusher, ¾" openings, capacity 3 to 4 tons, per hour, using about 15 h.p. at 240 RPM.
1 - Crusher bin, about 22 tons capacity, discharging to bin.
1 - Bucket evevator, 30 feet from boot to discharge over rolls.
1 - Bin ab out 62 tons capacity, discharging to
1 - Automatic feeder requiring about ½ h.p. discharging to
1 - Set of rolls 14x34", set to 1/8" opening, capy.5 tons per hr. at 67 RPM, requiring 20 to 25 h.p. discharging to
1 - Bucket elevator 31 feet from boot, to discharge over screens.
1 - Set of 3" impac screens as follows:
No.1 screen 1/8" mesh, oversize to belt conveyor (1/8 h.p. buck to rolls, undersize to No.2 screen 1/16" mesh, oversize to No.1 jig, undersize to Chillean Mill.
1 - 6' nominal diameter Chillean Mill, capacity about 4½ tons at 25 RPM, using about 25 h.p. discharging through 20 mesh screen to
Hydralic classifiers, cone type, of 2' 2½' and 3' cones, discharging oversize respectively.
2 - Ledwick tables 1½ tons capacity, ¾ h.p. each.
1 - Corrugated belt, 6' Frusvanser of coarse sands.
1 - Isabel concentrator, undersize from three classifiers fees to
10' Hydraulic separating tank, discharging its slimes to
1 - 6' Frusvanser, smooth belt for slimes.
All the wash matter is c ollected in a V shaped tank below the Mill from which the tailings are discharged into the gulch. About 60 percent of the water is available to be returned and re-used.

Pipeline taken up 3 mo ago and sold

When the Mill was last operated, we secured our water from the Hassayampa River, the pipe line from the river to the mine is 7½ miles long. 3½" pipe is used. On the river we have a pumping plant, housing a 40 h.p. Fairbanks-Morse gasoline engine and pump. Above our mill are two water tanks in good condition. One 16,000 and the other 60,000 gal.eapty.

On our property there are located bunk houses sufficient to accommodate about 25 men. Other buildings consists of Mine Office, Storehouse, Cook house, Assay Office, Garage and Superintendent's house, With an expenditure of a few hundred dollars these buildings could be put in good state of repair. There is a great deal of miscellaneous small equipment on hand that is in a usable condition, such as mining cars, T rail and pipe fittings, set, etc. On the other hand, when we start more active operations here, we will have to expend some money for some miscellaneous small equipment, such as picks, shovels, hollow drill steel, etc.

Good condition now on hoisting shaft

At the shaft house, we have a 15 h.p. Fairbanks-Morse hoist. Also installed in the shaft house is a 4o h.p. engine and a 2x12 Sullivan Compressor. All of this equipment is in good condition, and will supply sufficient power for our needs for some time to come. Both of the engines consume gasoline. We have on hand two Jackhammer drills, ingersall Rand type, and two stoper drills. Our blacksmith shop is equipped with most of necessary essentials.

About 3 miles from the mine is a piece of patented ground, about 10 acres in extent. This ground was acquired on account of the fact that it contained a spring of water which is excellent for drinking purposes. A road connects this spring with the property. In the past, water for drinking purposes was hauled from this spring to the mine. The water developed nearer the mine is not suitable for drinking purposes. It would be quite feasible to place a big tank below the mill and collect in it rainwater from the mill roof, this could be used for drinking purposes.

In regard to the future development of the mine, there are two plans that commend themselves to me: One involves continuing extension of that drift at the 246' level of the vertical shaft. As before stated, at this point excellent ore was encountered, and it is the only point on the property where there was any deep workings. The carrying out of this plan would involve re-timbering of the shaft, the timber being in very bad shape. The number of feet of backs of ore that is sulphide in character above the 246' level is of course very limited,-possibly not more than 100'. After this is exhausted, we would be obliged to run lower levels. This would involve the expense of running through barren ground where the vein would be encountered. The vertical shaft is 515' deep, and the water now stands at a level 210± from the collar of the shaft. The vein referred to at the 246' level is in my opinion not the main vein.

Leaves vein at 50 depth

An alternative plan, which is the one that I recommend involves sinking an incline shaft starting at the outcrop, and following the dip of the vein at a point about 300' distant from the collar of the vertical shaft, and about 100' lower. The main vein outcrops at this point, and it is the lowest point on the property where I have identified the main vein.

Little or No oxidation

← not so!!

The vein at this point is thoroughly oxidized and therefore the values have been leached out. The presence of copper is easily discernable. It is my idea to sink a small incline just large enough for hauling, with space on the side for man-way and air, and water pipes for power drills. It would not be difficult to enlarge this shaft later on to meet requirements for ore removal. This incline shaft plan would obviously involve removing the hoist, compressor and engine, and blacksmith shop from their present location, to the site that I have selected, with an incline shaft the workings will always be in ore. If theore increases in richness and volume at depth as many have predicted, this would be the quickest way of proving that theory. I feel satisfied from my study of the ground that at a depth of not more than 400' we should encounter ore of the same character as was found at the 246' level of the vertical shaft. I confidently expect that a depth of not more than 500' that we will encounter all of the water that we will need for milling purposes. If this happens, we will secure water at a much less expense than heretofore. The man that operates the hoist and compressor could pump the water out of the mine, and it would flow by gravity to the tanks above the Mill. The upkeep of the water supply for the Mill would be negligible whereas in the case of our long pipe line, much time is wasted, and expense, on account of the fact that extreme heat in summer causes the pipe line to break. With the incline shaft plan less timber would have to be used, and greater volume of ore would be developed and at a less cost per ton than would be in the case with the vertical shaft plan

In conclusion, I take pleasure in stating that I regard these mining claims of great promise, and which, if developed, should easily pay handsome returns to any Company operating the same.

Signed, Alexander Spotswood,
A.I.M.E.

Wickenburg, Ariz.
October 20, 1922.

J. C. EDWARDS, PRESIDENT
DR. JAS. T. ROSS, VICE-PRESIDENT

C. L. TINSLEY, SECRETARY AND TREASURER
MACON, GA.

JUMBO COPPER COMPANY

AUTH ED CAPITAL $300,000

MINE: WICKINGBURG, ARIZONA

DIRECTORS
C EDWARDS, MACON, GA.
T. ROSS, VICE-PRESIDENT, MACON, GA.
W. O. DONOVAN, VIDALIA, GA.
FRANCIS HERRING, MACON, GA.
HARRY GARDEN, MACON, GA.
T. L. FUNDERBURKE, MACON, GA.
C. L. TINSLEY, MACON, GA.

Macon, Ga., March 6, 1926.

Federal Mining & Smelting Co.,

Alamogordo, New Mexico.

Gentlemen:-

We wish to offer to sell, or lease to you with the privilege of buying, a property that can be made a large copper mine. This property is known as the Monarch Mine, situated by road some nine miles east of Wickenburg, Yavapai County, Arizona, and consisting of six patented claims and three held by virtue of mineral location, all in one continuous group, totalling 180 acres.

The last report on the property was made by Mr. Alexander Spotswood, A.I.M.E., Burlingame, Cal., who was recommended to us as a man of ability and good character. We also have a letter from him in which he says:

"I do not know of any undeveloped copper property that I regard as favorably as the Monarch Mine".

Would be pleased to give you all data and information we have about this property, and you would be welcome to make all the examination you want.

Yours truly,

Jumbo Copper Co.,

J. C. Edwards

President.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

RED PICACHO QUADRANGLE
ARIZONA
7.5 MINUTE SERIES (TOPOGRAPHIC)

Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

Topography by photogrammetric methods from aerial photographs taken 1962. Field checked 1964

Polyconic projection. 1927 North American datum
10,000-foot grid based on Arizona coordinate system, centrall zone
1000-meter Universal Transverse Mercator grid ticks, zone 12, shown in blue

UTM GRID AND 1964 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

CONTOUR INTERVAL 40 FEET
DOTTED LINES REPRESENT 20-FOOT CONTOURS
DATUM IS MEAN SEA LEVEL

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER 25, COLORADO OR WASHINGTON 25, D. C.
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

QUADRANGLE LOCATION

ROAD CLASSIFICATION
Light-duty ..... Unimproved dirt

RED PICACHO, ARIZ.
N3352.5—W11230/7.5
1964
AMS 3451 I NE—SERIES V898

JDS

DEL TIERRA ENGINEERING & MINING CORP.
HARVEY W. SMITH, E.M. PRESIDENT
Registered Mining Engineer U.S. Mineral Surveyer
U.S. Approved Title Abstracter
Member Board of Governors
Arizona Dept. of Mines & Mineral Resources
4310 North Brown Avenue / Suite 3 Scottsdale, Arizona 85251
Tel. 602 / 946-3996

August 31, 1987

E. Henry Valentine Jr. M.D.
1848 Northeast 4th Ave.
Miami, FL 33132

Dear Dr. Valentine:

At your request I have reviewed the geologic and assay reports prepared for your Lion Mountain Land and Mining Company property and find they indicate significant gold mineralization. It is my opinion that further exploratory work should be done, based on the following factors:

1. Anomalous gold has been found in the exploration drilling to date.

2. The Monarch Mine has produced, in the past, ore which according to early reports contained gold in significant amounts.

3. The surrounding area is known for its gold mines - Vulture, Congress, Octave, etc.

4. Sufficient acreage is held by the Lion Mountain Land and Mining Company to properly explore the presently known anomalous gold findings.

You may use this expression of opinion in a prospectus if you so desire.

Sincerely,

Harvey W. Smith

Harvey W. Smith, E.M.
President

HWS/hm

GENERAL DEVELOPMENT

of COMPANY

Introductory Statement

LION MOUNTAIN LAND AND MINING COMPANY, INCORPORATED was incorporated for the purpose of acquiring, exploring, developing and operating gold, silver, copper and other mineral properties and to engage in the production and transportation of such ores and minerals.

At the present time the Corporation is engaged in performing further exploration of the property. However, the corporation does not wish to make any representation relative to the size or quantity of any ore body on its property, in that all work remains in an exploration stage.

Gold and Silver
Their Properties, Uses and Markets

Gold was one of the first metals used by man and the supply-demand relationships for gold differ from those of all other mineral commodities. Its intrinsic value creates a demand that so far has not been fulfilled. While much of the annual production is hoarded, a moderate amount is used in the arts and industry--electronics, jewelry. It is probable that gold will continue to be a stable alternative to paper money as well as expanded uses in industry and the arts.

Silver is also valuable for intrinsic value, but to a much lesser extent than gold. However, its industrial use is much greater, being widely used in photography, electronics and arts and crafts. It is expected that industrial use will continue to grow.

The increased demand for gold and silver as well as their prices has caused a considerable expansion in exploration activities. Known anomalous gold and silver prospects will soon be at a premium.

HISTORY

LION MOUNTAIN LAND AND MINING COMPANY, INCORPORATED was organized under the laws of the State of Delaware on the 2nd day of June, 1987 with its principal office in Florida located at 1848 N.E. Fourth Avenue, Miami, Florida 33132. The Corporation

is qualified to do business in the State of Arizona and maintains an office located at 4310 North Brown Avenue, Suite 3, Scottsdale, AZ 85251, c/o Del Tierra Engineering & Mining Corp. The incorporator, E. Henry Valentine Jr., M.D. leased his mining property to the Corporation for a ten-year period with an option for an additional ten years. This property and others to be acquired are to be explored and developed for ore potential. Dr. Valentine has spent considerable time and money on the preliminary exploration of this property prior to its being leased to the Corporation. As a result of the initial investigation conducted, Dr. Valentine decided to expand the exploration and development by means of an offering of the Corporation's securities.

Arizona has always been a mining intensive state and still is producing the major portion of the Nation's copper as well as major amounts of gold and silver. Wickenburg, 10 air miles west of the Corporation property, is adjacent to the historic Vulture and Congress gold mines as well as numerous others in the near vicinity. Additionally, major mineral deposits have been found northward in the Bradshaw Mountains as well as at Jerome, northeasterly from the property. Eastward exploration for gold is continuing in the Lake Pleasant area and westward other gold properties are being developed. And the LION MOUNTAIN LAND AND MINING CORPORATION property is situated practically in the center of all this activity.

The six patented claims were located by a Mr. Rylander circa 1900. Upon his death his widow sold the claims and the Monarch Mining & Smelting Company was formed and incorporated in 1904. Considerable development was done - shafts, tunnels, underground workings - on veins reportedly assaying 2-20% copper, 1-3 ounces of silver and 0.1-0.75 ounces of gold per ton. It is reported some ore was shipped to the Old Humboldt Smelter but those records are not available. The mine was operated until approximately 1915. Since that time not much work was done on the property until the Corporation incorporator, E. Henry Valentine Jr., M.D. obtained title to the property in 1961. Prior to that time his grandfather, Dr. James T. Ross had controlled the property.

When the price of gold began to escalate, Dr. Valentine became seriously interested in the property. Since the Old Monarch Mine had produced gold in addition to copper and silver he thought there may be more in the vicinity. His initial prospecting revealed some interesting samples that showed anamalous gold and as a result, in 1973 he added 49 unpatented claims to his 6 patented claim holdings. As his exploration efforts continued in doing his annual assessment work he was further encouraged and so added additional claims which now brings his total holdings to 123.

HISTORY (continued)

In the process of doing his exploration work he has done a considerable amount of diamond core and rotary drilling and geophysical testing. The latter was an Induced Polarization and Resistivity survey conducted by Mining Geophysical Surveys of Tucson. This work demonstrated a broad anamalous response at 2000+/- feet. This anomaly could be a porphyry copper type of deposit or iron pyrite with or without gold. Dr. Valentine has started a drill hole to test this anomaly and is presently down 1,750 feet. This means there is approximately 250 feet to go to reach the potential favorable zone.

The most interesting aspect of Dr. Valentine's work to date, however, is the combination of surface samples and the shallow drilling on favorable zones. Six holes have been drilled on rather wide spacing and all show varying amounts of gold from surface down to 400 feet. Some of the assays revealed ore-grade material, thus leading one to the expectation that more drilling may lead to a trend that would develop into an ore body.

CORPORATION PROPERTIES

The Issuer's property consists of six patented mining claims, one patented millsite and 117 unpatented mining claims located in Secs. 4, 5, 28, 29, 32 & 33, Ts.7 & 8 N., R.3 W., G.& S.R.M., Yavapai County, Arizona. This comprises approximately 2,350 acres in the White Picacho Mining District 15 miles via road east of Wickenburg, Arizona. Present access requires four-wheel drive vehicles.

Wickenburg would be a minor supply point, however, labor should be adequate. Phoenix, Arizona is only 60 miles southeast of Wickenburg and would be the major supply point.

Topographically the Corporation's claim area is in the low foothills of the Wickenburg Mountains where elevations range from 2,800 - 3,800 feet above sea level.

Climatically the area is semi-arid. Temperatures fluctuate from a minimum of 20° F. +/- for a brief winter period to well in excess of 100°F. during the summer months. Snowfall is very scanty and the summers are dry except for very occasional torrential rainfall.

GEOLOGY

The Corporation retained the services of Mr. Gerald Weathers, a Mining Geologist of Lake Montezuma, Arizona to conduct an examination of the corporate properties for the purpose of submitting a geologic report. Mr. Weathers' complete report is on file at the Corporation's Miami office. Following are excerpts from that report:

General Geology

"The Monarch Mine is situated within the basin and range province, in the low lying Wickenburg Mountains, at an elevation of approximately 3,200 feet. It is underlain by older pre-Cambrian metamorphic schists and granite with occasional outcroppings of Cretaceous andesites and Tertiary - Cretaceous dikes and plugs. (Younger rocks). The schist 'locally includes diorite, rhyolite and greenstone'; the 'dikes and plugs are granitic, dioritic, rhyolitic and andesitic.'"

"The main workings on the property were excavated within a narrow (5-10' thick) diorite dike (original reports) striking northwesterly and dipping 30° to the southwest. It is exposed over much of the patented property, but is overlain by schist with a northeasterly trending schistosity in places such as in the vicinity of the No. 2647 Mineral Monument. Since the texture of the majority of the outcropping host rock is microcrystalline, it is classified as an andesite. The surrounding area is comprised of pre-Cambrian schists and granites containing stringers of pegmatite. Quartz monzonite can be found on the dump of the main shaft near the old millsite."

Mineralization

"The andesite/diorite dike has been brecciated and resealed with quartz and associated mineralization. Mineralization in the breccia zones consists of chalcopyrite, chalcocite, pyrite, malachite, other copper oxides, limonite and manganese oxides. Copper oxides were also observed in prospect pits scattered over the property in which the host rock varies from schists to pegmatites. Composite samples from holes drilled on the unpatented claims assayed for copper, gold and silver proved the occurrence of these elements on those claims."

Sample Assays

"Channel and representative samples of stockpiled dike material taken in 1972 were assayed for copper and copper oxides. Copper assays varied from 0.16% to 1.42%. Assays of some prospect drill hole samples varied from 15 to 1,100 PPM copper. Drill cuttings from Hole 'A' assayed an average .026 oz. Au/ton, over a sample interval of 160 feet; other drill hole sample assays show the presence of anomalous gold."

POTENTIAL

The Lion Mountain Land and Mining Company, Incorporated property has the potential to be a good gold, silver and copper producer. Again, quoting from Mr. Weathers' geologic report:

POTENTIAL (continued)

"The Monarch area of the Lion Mountain Land and Mining Company certainly exhibits many of the geological characteristics associated with the occurrence of an underlying ore deposit. These characteristics include the occurrence of volcanic and plutonic rock types in the basin and range province, intersecting structures, plus copper and gold mineralization (frequently in the ore grade range) associated with different rock types."

"The property is therefore judged worthy of continued exploration in search for an underlying ore body."

Mr. Weathers has given his permission to use his recommendation in the prospectus.

In addition to Mr. Weathers' recommendation, Mr. Harvey W. Smith, E.M. of Scottsdale, Arizona, a Professional Consulting Mining Engineer, also recommends that further exploration be carried out. His statement is contained in the attached letter.

Mr. Smith believes there are two possibilities - a low cost open pit operation as indicated by the drill hole showing mineralization from 10-170 feet or an underground mine similar to the Old Monarch Mine. If an ore body can be developed around the hole showing mineralization from 10-170 feet it would be particularly advantageous because there may be very little overburden or waste to strip.

Mr. Weathers' and Mr. Smith's curricula vitae are enclosed herewith.

Future Acquisitions

In addition to the Lion Mountain property, Dr. Valentine knows of several other prospects which offer considerable potential. Some of the proceeds from the sale of the company securities will assist in acquiring these prospects.

Drafted By:

Harvey W. Smith, E.M.
Registered Mining Engineer

Plan of Operation

The company will concentrate on exploration and development of minerals which the company believes have potential for "open-pit" mining (See Glossary). However, the deep geophysical anomaly will also be pursued. The presently existing hole drilled by Dr. Valentine is down to 1,750 feet, leaving only 250 feet to go to reach the potentially favorable zone.

It will undertake a field exploration program to pursue the known mineralization developed by Dr. Valentine. Field exploration consists primarily of geological mapping, sampling and drilling - diamond core or rotary. If the area continues to show promise the company will continue its drilling program with the expectation of developing an ore body.

In other areas of the claims, geochemical surveys may be undertaken to look for trace elements often associated with gold deposits. Geophysical surveys may also be used to determine the possible presence of mineralization.

Drafted By:

Harvey W. Smith, E.M.
Registered Mining Engineer

RESUME OF PROFESSIONAL CAREER

HARVEY W. SMITH, E.M.
Registered Mining Engineer
U.S. Mineral Surveyor
U.S. Approved Title Abstracter
Registered Land Surveyor
Member Board of Governors, AZ Department of Mines & Mineral Resources

1957-Present — Consulting Mining Engineer and U.S. Mineral Surveyor
During this time I have worked for numerous clients from individuals to the major mining and oil companies to the State and Federal Government. My work has covered practically all phases of mining and geology - from examining prospects, geological evaluations, exploration programs, engineering surveys, both underground and surface and surveying of mining claims.

1956-1957 — Operated a uranium lease in northern Arizona for my own account.

1956 — Bureau of Land Management, Phoenix, Arizona
Mining engineer examining claims for valid mineral discovery.

1954-1955 — Ryan Oil Company - Grand Junction, Colorado
Examined all types of mineral prospects, supervised diamond drill exploration programs.

1953 — U.S. Atomic Energy Commission
Made examinations of prospects for ore reserve calculations.

1950-1952 — Recalled to Military Service.
Company Commander with an Engineer Construction Battalion, then Battalion Supply Officer, then assigned to teaching R.O.T.C. of Colorado School of Mines - Captain, Corps of Engineers.

1949-1950 — Magma Copper Company, Superior, Arizona
Initially employed as underground miners assistant working in square-set stopes and on a contract driving main haulage drifts. Eventually promoted to engineering staff.

1946-1949 — Attended Colorado School of Mines. Graduated as Engineer of Mines, May, 1949. Entered school January 28, 1946, 40 days after returning from overseas. Completed four years of study in 3 1/2 years with 204 semester hours.

RESUME (continued)
Harvey W. Smith

1941-1946	Military Service Drafted in April, 1941. In October, 1942 assigned to Ordnance School, graduated as 2nd Lt. in January 1943 and assigned to Ammunition Company. Had additional training in bomb disposal techniques as an enlisted man prior to Officer Candidate School. Later, as 2nd Lt. I took additional bomb disposal training at Royal Engineer School at Wagga Wagga New South Wales, Australia. As a member of the Ammunition Company we made operational landings at Hollandia, New Guinea and Malabang, Mindanao, Phillipines. In November 1945 the unit was assigned occupational duty at Matsuyama, Shikoko, Japan. Returned to the States in December 1945. Released from active duty in March, 1946 as Captain, Ordnance Corps.
1940-1941	Worked as underground miner in a lead mine, Tecopa, California.
Memberships:	Society of Mining Engineers - A.I.M.E. Chairman Maricopa Section 1972 & 1973. In 1973 the Section sponsored the Pacific Southwest Minerals Industry Conference. Sir Ronald Prain was one of our guest speakers as was Harrison Schmitt, Astronaut. American Congress of Surveying and Mapping Mining Club of the Southwest

PARTIAL LIST OF CLIENTS

Echo Bay Exploration
Placer U.S. Inc. - Cortez Gold Mines
Newmont Exploration, Ltd.
United Nuclear
Magma Copper
Pillar Lowell & Assoc.
Kerr McGee
Superior Oil Co.
Exxon Minerals USA
Rocky Mountain Energy Co.
Phelps Dodge
American Copper & Nickel
Amselco (British Petroleum)
The Anaconda Company
Anamax Mining Co.
ASARCO
Jaquays Mining Co.
E. N. Pennebaker
San Manuel Copper Co.
Arkansas-Louisiana Gas Co.
Anschutz Uranium Corp.
Phillips Uranium Corp.
Sun Oil Company
Continental Illinois National Bank
Filters International, Inc.
Kennecott
Urangesellschaft
Union Oil Company
Sil-Flo, Inc.
Harborlite Corporation
Securities & Exchange Commission
Arizona Corporation Commission
Internal Revenue Service

THE LION MOUNTAIN LAND & MINING CO. PROSPECT

Yavapai Co, Az.

Gerald Weathers

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GEREX, INC.
MINERAL EXPLORATION

Post Office Box 826
Lake Montezuma, AZ. 86342

Telephone
(602) 567-4779

THE LION MOUNTAIN LAND AND MINING COMPANY PROSPECT

YAVAPAI COUNTY, ARIZONA

By

Gerald Weathers

INTRODUCTION

The Lion Mountain mineral prospect, examined by the writer in 1973, was investigated again September 13, 1987, at the request of and also accompanied by Dr. Henry Valentine, the property owner.

The purpose of the examination was to reacquaint the writer with the prospect, its geology, and mineralization in order to give an opinion as to whether or not the prospect is worthy of further exploration. The following report is based on the former examination, the brief re-examination in and around the principal development, a literature search and the writer's experience.

THE PROPERTY - LOCATION - ACCESSIBILITY

The property is located in Sections 5, 6, 31 & 32, T 7 & 8 N., R 3 W., G&SRB&M, White Picacho Mining District, Yavapai County, Arizona. (Fig. 2. Mine Location). It can

be reached by travelling northeast of Wickenburg, Arizona on the Constellation Road for about four miles, thence easterly for about 9 miles on an unimproved road to the mine workings. (Fig. 1 - Index Map).

HISTORY

The Lion Mountain Prospect, (formerly known as the Monarch Mine), is referred to in various mining publications dating from 1909 to 1924, such as Weed's Mining Handbook, when it was being actively developed for its copper, gold and silver content by Valentine's grandfather. No literature reference pertaining to the property after that period has been found.

A geological reconnaissance of the property was made by the writer at various intervals during September 1972, through February 1973, and the accessible workings examined and partially mapped and sampled.

Since the staffs of major mining companies were engaged in exploration for deep-seated copper porphyry ore bodies in the Wickenburg area at that time, it was recommended that an induced polarization and resistivity survey be made over the Monarch Mine by an independent consulting geophysical company in search for an underlying I. P. anomaly. (Often indicating the presence of a copper ore body). The survey resulted in a broad anomalous response extending beyond the property boundaries; therefore, it was

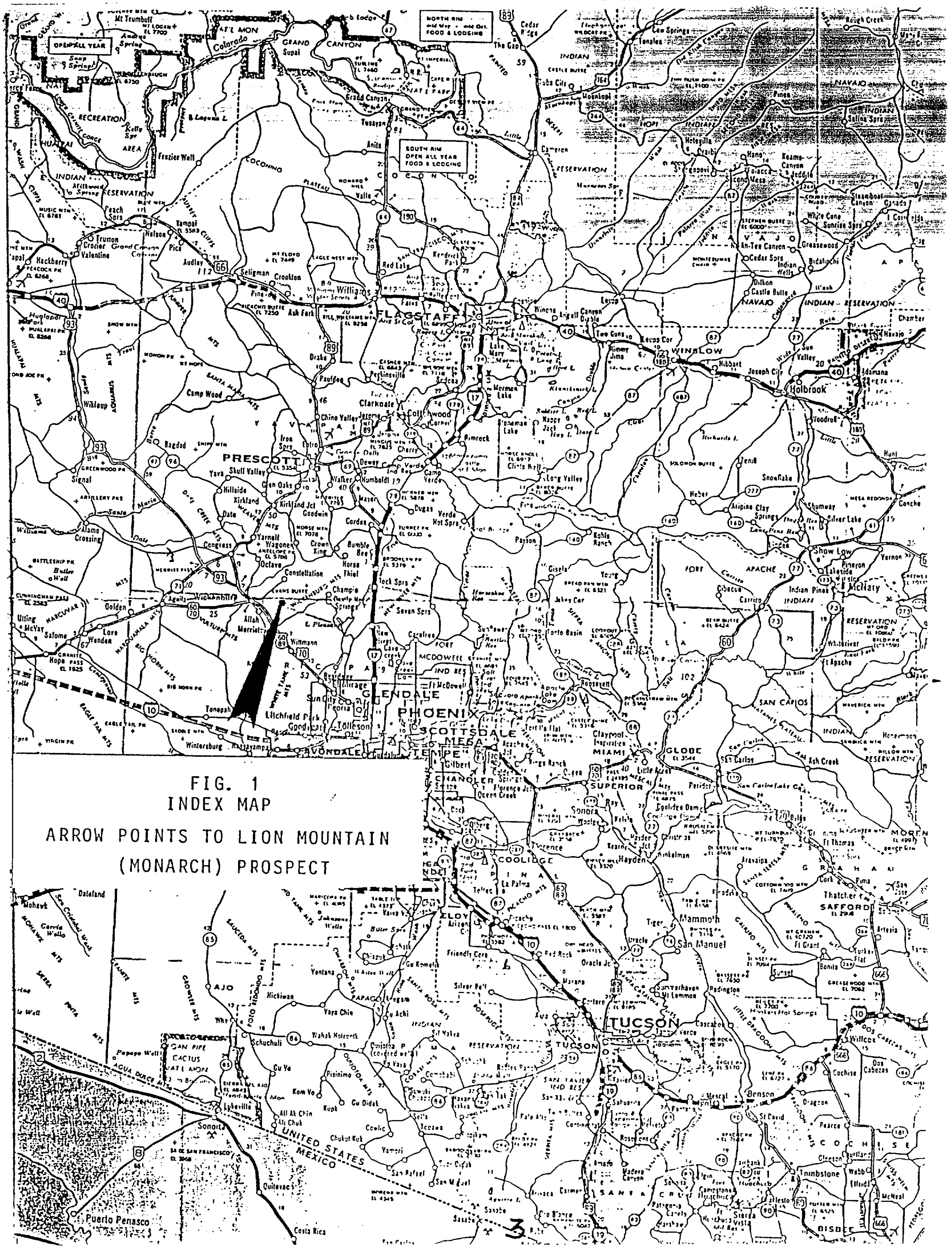


FIG. 1
INDEX MAP
ARROW POINTS TO LION MOUNTAIN
(MONARCH) PROSPECT

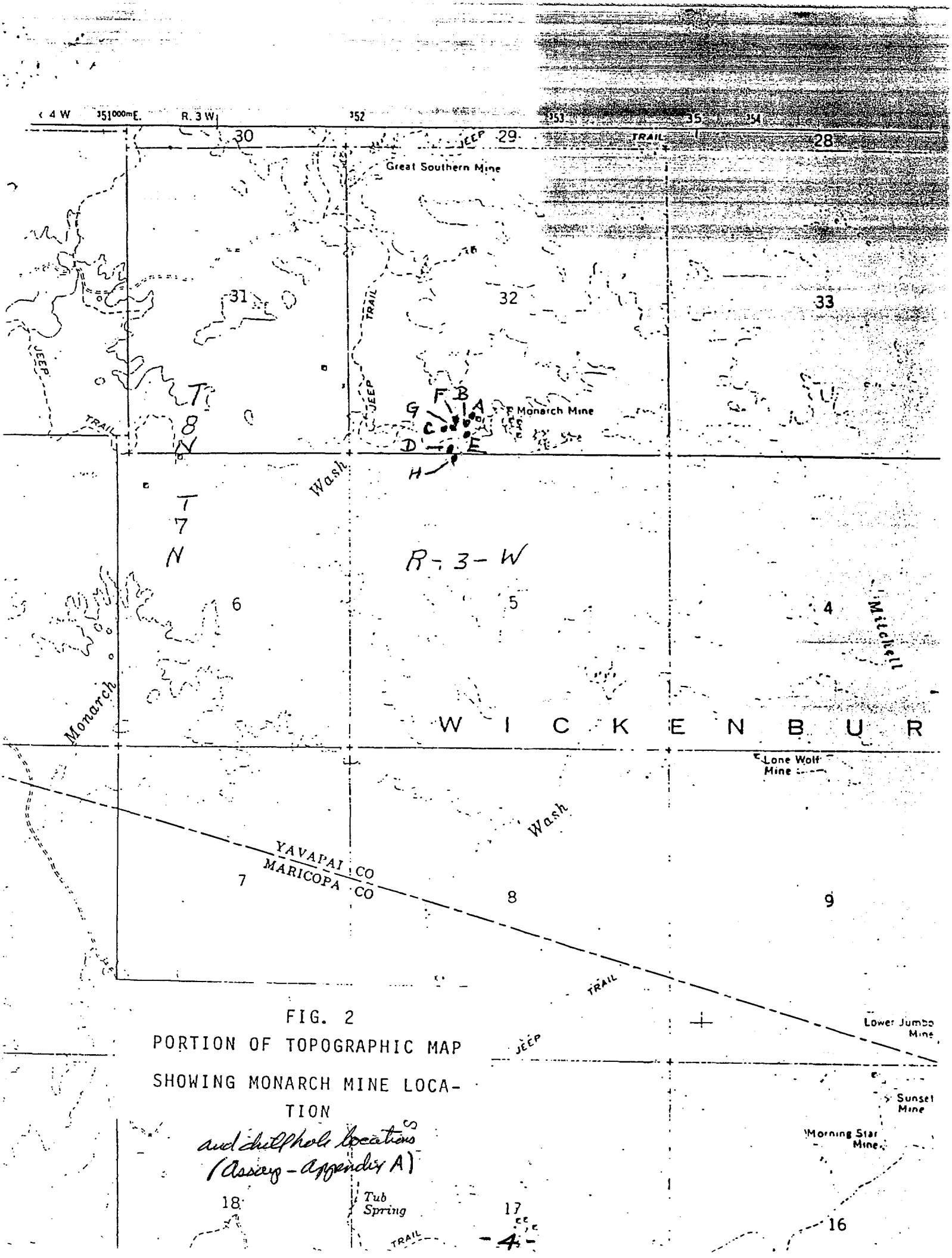


FIG. 2
PORTION OF TOPOGRAPHIC MAP
SHOWING MONARCH MINE LOCATION
and drillhole locations
(Assays - appendix A)

recommended that additional claims be acquired to cover the I.P. anomaly. These claims were staked under the direction of Harvey Smith, a Registered Mining Engineer, during the first part of 1973. Mr. Valentine has satisfied the annual assessment work requirements necessary to keep title to these claims by continued, intermittent drilling of a diamond drill hole toward the underlying I. P. anomaly. See Figure 2, for drill holes A thru H (1991).

DEVELOPMENT

Numerous adits with crosscuts, shafts and prospect pits have been excavated into an exposed, narrow andesite - diorite dike on the Monarch Property. Mineralized rock from these excavations were stockpiled around the workings presumably for future milling. (Fig. 5 - Monarch Mine).

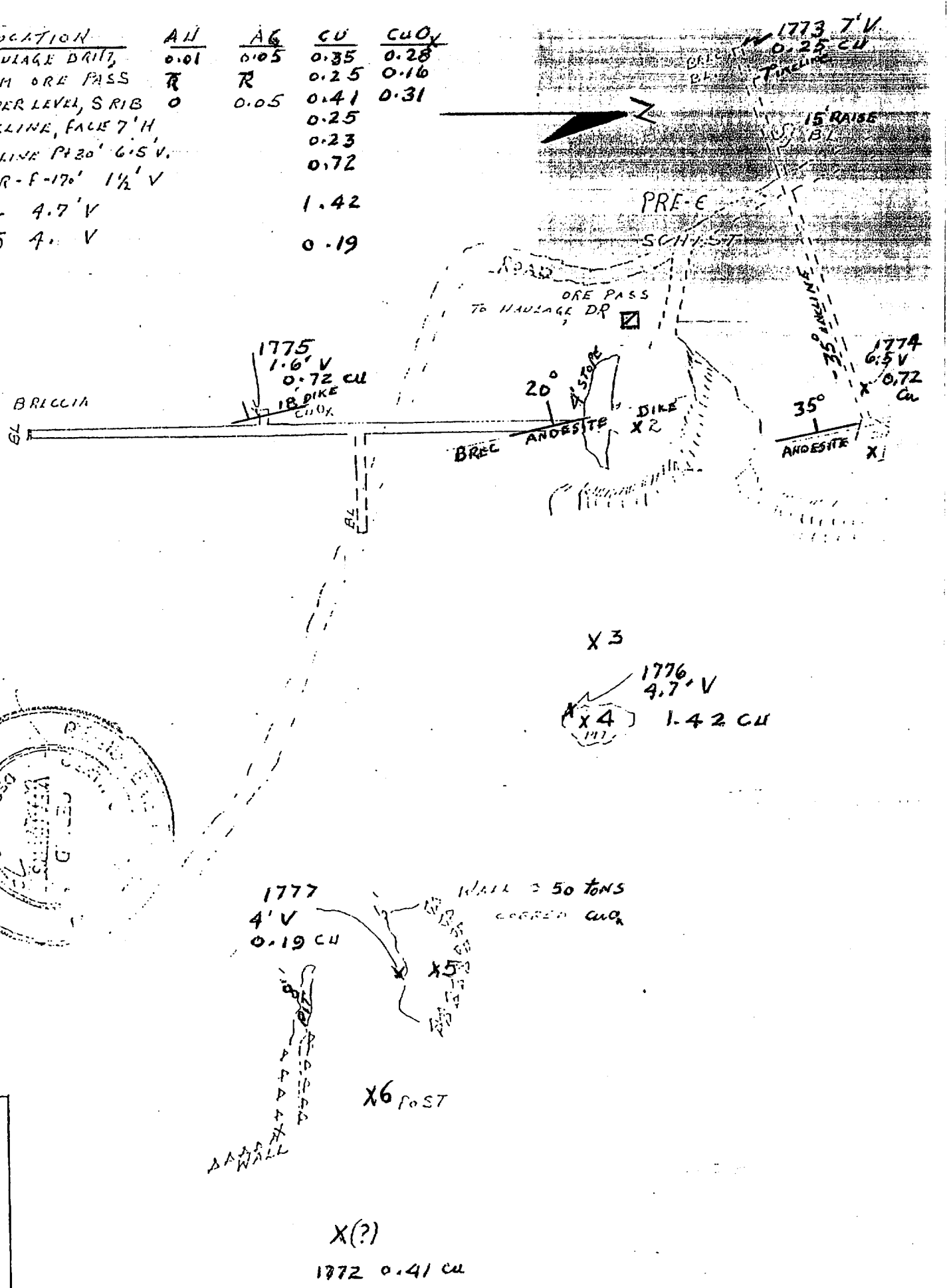
Foundations of a former mill, assay laboratory, stables, and housing are located near the mine workings. Water was obtained from a pipe line extending from the Hassayampa River to the property, from a nearby millsite claim (enclosing a spring), and from a dam across an adjacent wash. Recent development consists of four drill holes drilled under the direction of Henry Valentine, one of which is at a depth of 1600+ feet and currently being drilled to test the I.P. anomaly. (Estimated at a depth of 2,000 ft. ∓)

GEOLOGY

General Geology

The Monarch Mine is situated within the basin and range province,

SAMPLE	LOCATION	AU	AG	CU	CuOx
1771A	HAULAGE DRIFT,	0.01	0.05	0.35	0.28
1771B	FROM ORE PASS	R	R	0.25	0.16
1772	UPPER LEVEL, S RIB	0	0.05	0.41	0.31
1773	INCLINE, FACE 7'H			0.25	
1774	INCLINE PI 20' 6.5 V.			0.23	
1775	S DR-F-170' 1½' V			0.72	
1776	Δ 4 4.7' V			1.42	
1777	Δ 5 4. V			0.19	



MONARCH MINE
SEC 32 T 8N R 3W
YAVAPAI CO., AZ
1" = 100'

Monarch Mine
1" = 100'

in the low lying Wickenburg Mountains, at an elevation of approximately 3,200 feet. It is underlain by older pre-Cambrian metamorphic schists and granite with occasional outcroppings of Cretaceous andesites and Tertiary - Cretacecous dikes and plugs. (Younger rocks). The schist "locally includes diorite, rhyolite and greenstone"; the "dikes and plugs are granitic, dioritic, rhyolitic and andesitic". (Refer to Fig. 4. Portion of State Geologic Map).

Local Geology

The main workings on the property were excavated within a narrow (5-10' thick) diorite dike (original reports) striking northwesterly and dipping 30° to the southwest. It is exposed over much of the patented property, but is overlain by schist with a northeasterly trending schistosity in places such as in the vicinity of the No. 2647 Mineral Monument. Western knob above mine. Since the texture of the majority of the outcropping host rock is microcrystalline, it is classified as an andesite. The surrounding area is comprised of pre-Cambrian schists and granites containing stringers of pegmatite. Quartz monzonite can be found on the dump of the main shaft near the old millsite.

MINERALIZATION

The andesite/diorite dike has been brecciated and resealed with quartz and associated mineralization. Mineralization in the breccia zones consists of chalcopyrite,

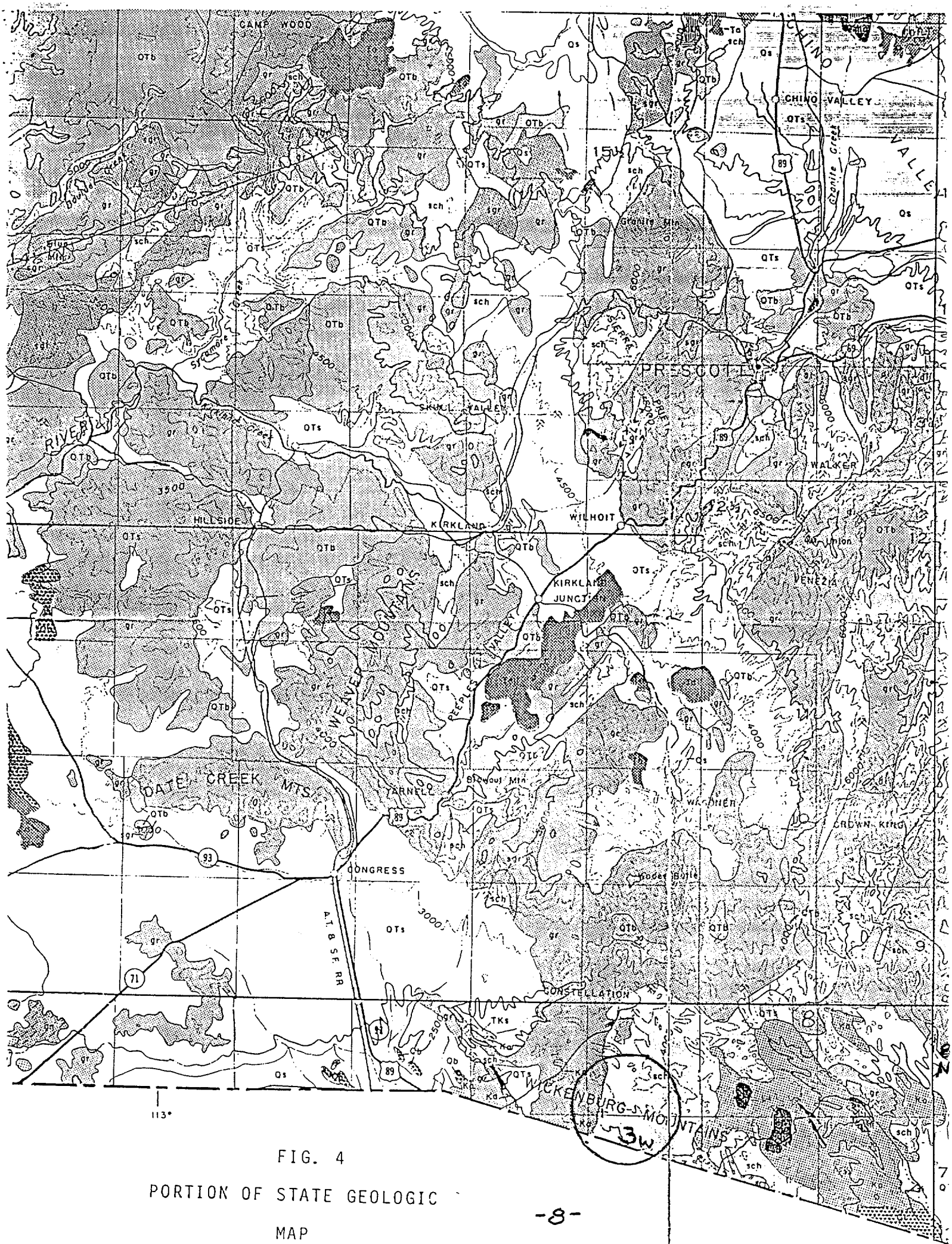


FIG. 4

PORTION OF STATE GEOLOGIC

MAP

chalcocite, pyrite, malachite, other copper oxides, limonite and manganese oxides. Copper oxides were also observed in prospect pits scattered over the property in wh ich the host rock varies from schists to pegmatites. Composite samples from validation holes drilled on the unpatented claims (required in 1973), assayed for copper, gold and silver proved the occurrence of these elements on those claims.

SAMPLE ASSAYS

Channel and representative samples of stockpiled dike material taken in 1972 were assayed for copper, copper oxides, gold and silver. Copper assays varied from 0.16% to 1.42%. (Gold and silver assays were not completed or received as gold at that time was valued at $38/oz. and silver at $ 2/oz.) Assays of some of the validation drill hole samples varied from 15 to 1,100 PPM copper, the remainder were not received. (Refer to attached Sample Assay Sheets).

Henry Valentine has submitted a fire assay certificate dated 1979 showing assays of drill cuttings from Hole "A" to average .026 oz. Au/ton, over a sample interval of 160 feet; other drill hole sample assays showing the presence of gold submitted by Valentine are included with this report. (Refer to attached Sample Assay Sheets).

GEOLOGICAL CRITERIA PERTAINING TO THE FORMATION OF MINERAL DEPOSITS

Continued studies of geological systems wherein the "formation of an ore deposit is dependent upon some sequential combination of chemical, physical and hydrologic process"[8]

has resulted in the interpretation of mineral deposition based on both empirical and theoretical criteria.

Many of the mineral deposits in the southwestern United States are associated with hydrothermal solutions (hot water) in which mineral occurrences are broadly zoned. "Copper would be most abundant at deeper levels, lead, zinc, silver and gold next shallowest and mercury, antimony and arsenic near the surface." [2/10] Hydrothermal alteration of the mineral zone and wall rock accompanies this mineralization, such as silicification, argillic and propylitic. These hydrothermal solutions often migrate along structures which provide a permeable conduit reflecting a volcanic - plutonic - tectonic environment.

RECENT MINERAL EXPLORATION, TARGETS AND TECHNIQUES

In recent years the majority of the large U. S. metal mining companies have experienced a negative cash flow due to low metal prices, foreign competition, labor problems, etc. consequently, they have drastically reduced their base metal exploration efforts. Meanwhile, gold prices have risen from $38/oz. to the $460/oz. range. The success of the discovery and mining of bulk precious metal deposits in the western United States has caused both large and small mining companies to switch their exploration efforts to a search for surface or near-surface, large, low-grade gold deposits.

These companies report a cash cost of production of approximately $130-$160/oz. with a cut off grade of .01 oz. Au/ton. A tabulation of 31 deposits indicates ore grades range from .006 to 0.32 oz. Au/ton.

Geological exploration techniques consist of geological data collection such as geological mapping, structural and alteration studies, and geophysical surveys, with an emphasis on exploration geochemistry. Concentrations of trace elements associated with gold deposits include Hg, Ba, Sb, As, Ag and Au.

The geological data is interpreted and evaluated to determine if it fits into a mineral deposit type. (A Model). The exploration program is designed to delineate the mineral deposit model.

POTENTIAL

The Monarch area of the Lion Mountain Land and Mining Company certainly exhibits many of the geological characteristics associated with the occurrence of an underlying ore deposit described in the previous paragraphs. These characteristics include the occurrence of volcanic and plutonic rock types in the basin and range province, intersecting structures, plus copper and gold mineralization (frequently in the ore grade range) associated with different rock types.

The property is therefore judged worthy of continued exploration in search for an underlying ore body.

PROPOSED EXPLORATION PROGRAM

Phase I

1. Sample the stockpiled dike material and assay for Cu, Au, and Ag. Send pulps to several assay labs for assay comparisons.

2. Prepare a base map and geologically map the entire property. Map the structures with emphasis on those related to mineralization, particularly at structural intersections.

3. Log the core from the 1,600 foot deep hole currently being drilled, describing types of hydrothermal alteration. Split the mineralized core and submit split drill core samples for assay. (Selected core only).

4. Conduct a geochemical survey on a grid system over the property, analyzing samples for mercury first, then multiple element determinations such as As, Au, Ag and Sb.

5. Conduct a geophysical survey. It was noted that both the andesite and the drill core are magnetic.

6. Interpret and evaluate the geological data obtained.

Phase II

The following phases are dependent upon the results obtained from each step in sequence.

Drill the most promising anomalous area found by these methods in search for a surface or near surface gold ore body. (Preferably reverse circulation drilling).

Retain the services of a hydrologist to locate an adequate water supply.

Send bulk samples of ore grade material to a laboratory Specializing in heap leach testing and ore evaluation for feasibility studies.

Evaluate the core hole and drill core sample assays to determine whether or not to continue drilling the hole now or in the future.

Phase III

This phase consists of closer spaced development drilling designed to provide information for tonnage and grade estimates, followed by a Federal Environmental impact study prior to mining.

Phase IV

Determine the most feasible mining and recovery systems and put them into effect to produce a marketable product.

COST ESTIMATES

Cost estimates for the proposed exploration and development program have not been presented in this report since discussions with Valentine concerning financing the proposed exploration program have not been held to date.

September 24, 1987

Gerald Weathers

THE LION MOUNTAIN LAND & MINING CO. PROSPECT

YAVAPAI COUNTY, ARIZONA

REFERENCES

The following references were used as a guide or quoted:

1. AMAX, 1987, Second Quarter Report.

2. Butler, G. M. 1935, Some facts about ore deposits.

3. Colorado School of Mines, 1955, Classification of Rocks.

4. Exploration Technologies, Inc., 1987, Mobile Mercury Applications in the Search for Gold.

5. Freeport-McMcran Co., 1987, Second Quarter Report.

6. Geological Society of Nevada, 1987, Bulk Mineable Precious Metal Deposits of the Western United States.

7. Newmont Gold Co., 1987, Second Quarter Report.

8. Reviews in Economic Geology, 1985, Geology and Geochemistry of Epithermal Systems.

9. Reviews in Economic Geology, 1986, Exploration Geochemistry; Design and Interpretation of Soil Surveys.

10. Titley & Hicks, 1966, Geology of the Porphyry Copper Deposits, Southwestern North America.

11. Wilkens, Joe, 1984, Gold and Silver Deposits of the Basin & Range Province, Western U.S.A. AGS Digest

GEREX, INC.
MINERAL EXPLORATION

Post Office Box 826
Lake Montezuma, AZ. 86342

Telephone
(602) 567-4779

EXPERIENCE RESUME

GERALD WEATHERS

PROFESSIONAL GEOLOGIST

April 1970 to Present - Consulting professional geologist, Registered State of Arizona since 1956. Primarily engaged in mineral property evaluation, exploration and development for numerous, varied clients.

May 1969 - April 1970 - U. S. Exploration Manager for Thermochem Industries, Vancouver, B. C.

October 1964 - May 1969 - Mineral Geologist, District Manager, Arkansas-Louisiana Gas Co. (ARKLA), Shreveport, La.

May 1958 - October 1964 - Consulting Professional Geologist.

June 1954 - May 1958 - Successively Geologist, Chief Geologist and Manager, Continental Uranium, Inc. Phoenix, Arizona. (Assisted in discovery and operation of small U_3O_8 mine), conducted airborne surveys, evaluated mineral prospects).

March 1953 - June 1954 - Exploration Geologist, Atomic Energy Commission.

June 1950 - March 1953 - Exploration and Mining Geologist, American Zinc Co., Mascot, Tennessee. (Assisted in discovery of Young and Coy Mines).

September 1947 - September 1948 - Engineering Geologist, U. S. Corps of Engineers, Kansas City District.

Education -

Masters Degree in Geology - Washington University, St. Louis, Missouri, 1950. Periodic refresher-extension courses in geochemical, computer applications, etc.

Honors -

Sigma Xi

Military -

Signal Corps and O.S.S. in U.S., E.T.O. and C.B.I. IN World War II.

REGISTERED CERTIFICATE

GEREX, INC.
MINERAL EXPLORATION

Post Office Box 826
Lake Montezuma, AZ. 86342

Telephone
(602) 567-4779

September 24, 1987

Dr. Valentine is granted permission to use my professional report, "THE LION MOUNTAIN LAND & MINING CO. PROSPECT, YAVAPAI CO., AZ." dated 9-24-87 in a prospectus for the securities of the Lion Mtn. Land & Mining Co., Inc. or for similar purposes.

Gerald Weathers

Appendix A

Assays of surface sample and Drill Holes #1 (A) thru #4 (D).

Reruns by various labs.

ARIZONA TESTING LABORATORIES

A DIVISION OF CLAUDE E. McLEAN & SON LABORATORIES, INC.
817 WEST MADISON ST. PHOENIX, ARIZONA 85007 PHONE [illegible]

For Mr. Henry Valentine
c/o Ramada Inn

Date September 13, 1972

Sample of Ore

Received: ------

Submitted by: same

ASSAY CERTIFICATE

Gold figured at $ 38.00 per ounce

Silver figured at $ 2.00 per ounce

LAB. NO.	IDENTIFICATION	GOLD		SILVER		PERCENTAGE	
		OZ. PER TON	VALUE	OZ. PER TON	VALUE	COPPER	[illegible]
3191	1771A HANLAGE DRIFT	0.01	$0.38	0.05	$0.10	0.35	0.23
	1771B HANLAGE DRIFT	trace		trace		0.25	0.16
	1772 [illegible] S RIB	nil		0.05	0.10	0.41	0.31
	1773 S.A. MAP			-		0.25	
	1774 "					0.23	
	1775 "					0.72	
	1776 "					1.42	
	1777 "					0.19	

Respectfully submitted,

ARIZONA TESTING LABORATORIES

Claude E. McLean

Claude E. McLean, Jr.

ASSAY CERTIFICATE

BOX 247 — PHONE 632-7410
HUMBOLDT, ARIZONA 86329

WALTER G. STETLER
Signed 2/16/79
ARIZONA, U.S.A.

E. Henry Valentine, Jr., M.D.
1848 Northeast Fourth Ave.
Miami, Florida 33132

Nov. 16, 1979

o.	SAMPLE DESCRIPTION	Gold oz/ton	Silver oz/ton	Copper %		
	Hole "A"					
-9	10-20	.040	Tr	0.02		
-10	20-30	.010	Tr	0.06		
-11	30-40	.020	0.06	0.04		
-12	40-50	.022	0.06	0.03		
-13	50-60	.008	Tr	0.05		
-14	60-70	.010	Nil	0.03		
-15	70-80	Tr	0.06	0.03		
-16	80-90	.032	0.07	0.03		
-17	90-100	.036	0.13	0.03		
-18	100-110	.058	Nil	0.04		
-19	110-120	.032	Nil	0.06		
-20	120-130	.014	Nil	0.07		
-21	130-140	.026	Tr	0.05		
-22	140-150	.020	Tr	0.08		
-23	150-160	.024	0.14	0.08		
-24	160-170	.068	0.19	0.04		
	Average	.02625				
	→ Average →	.02625	for 160 feet		(Hole "A")	

ES _____ ASSAYER _____

IRON KING ASSAY OFFICE

ASSAY CERTIFICATE

BOX 247 — PHONE 632-7410
HUMBOLDT, ARIZONA 86329

REGISTERED ASSAYER CERTIFICATE NO. L-2978 WALTER G. SABLER Date Signed 9-16-81 ARIZONA, U.S.A.

AY
DE

Henry Valentine

Sept. 16, 1981

SAMPLE DESCRIPTION			oz/ton Au	oz/ton Ag	% Cu		
-24	Hole #3	50-55	Tr	0.14	0.10		
-25	Hole "C"	55-60	Tr	0.10	0.12		
-26		60-65	0.004	0.08	0.07		
-27		65-70	Tr	0.08	0.06		
-28		70-75	Tr	0.08	0.03		
-29		75-80	Nil	0.08	0.04		
-30		80-85	Nil	0.08	0.05		
-31		85-90	Nil	0.08	0.03		
-32		90-95	Nil	0.16	0.01		
-33		95-100	Tr	Nil	0.03		
-34		100-105	Tr	0.14	0.03		
-35		105-110	Tr	0.06	0.13		
-36		110-115	Tr	0.06	0.03		
-37		115-120	Nil	Nil	0.03		
-38		120-125	0.020	0.14	0.04		
-39		125-130	Tr	0.16	0.04		
-40		130-135	0.006	0.16	0.04		
-41	Hole #4	0-5	Tr	0.26	1.50		
-42	Hole "D"	5-10	Nil	0.16	1.22		
-43		10-15	Tr	0.12	0.46		
-44		15-20	Tr	0.12	0.19		
-45		20-25	Nil	0.10	0.14		
-46		25-30	Nil	0.10	0.21		

ARGES_____ ASSAYER_____

IRON KING ASSAY OFFICE

ASSAY CERTIFICATE

BOX 247 — PHONE 632-7410
HUMBOLDT, ARIZONA 86329

REGISTERED ASSAYER CERTIFICATE NO. 2978 WALTER G. STATHAB Date Signed 9-16-81 ARIZONA, U.S.A.

SAY
DE

Henry Valentine

Sept. 16, 1981

SAMPLE DESCRIPTION			oz/ton Au	oz/ton Ag	% Cu		
-47	Hole #4	30-35	Tr	0.14	0.04		
-48	Hole "D"	35-40	Tr	0.04	0.05		
-49	Continued	40-45	Tr	0.10	0.05		
-50		45-50	Tr	0.12	0.03		
-51		50-55	Tr	0.12	0.04		
-52		55-60	Nil	Nil	0.03		
-53		60-65 →	0.004	Nil	0.04	This drill hole appears to cut the andesite dike. If so, it would appear to bode very well indeed for the gold and silver content of the dike (Hole "D") Gold averages .0425 oz/ton for twenty feet	
-54		65-70 →	0.026	Nil	0.03		
-55		70-75 →	0.008	0.04	0.03		
-56		75-80 →	0.132	0.55	0.03		
-57		80-85	Nil	Nil	0.05		
-58		85-90	Nil	Nil	0.03		
-59		90-95	Nil	Nil	0.03		
-60		95-100	Tr	0.18	0.04		
-61		100-105	Tr	0.08	0.02		
-62		105-110	Tr	0.08	0.04		
-63		110-115	Tr	0.14	0.02		
-64		115-120	Tr	0.14	0.04		
-65		120-125	0.004	0.04	0.04		
-66		125-130	Tr	0.02	0.04		
-67		130-135	Tr	0.02	0.03		
-68		135-140	Tr	0.06	0.05		
-69		140-145	Tr	0.12	0.04		

GES _____ ASSAYER _____

ASSAY CERTIFICATE

BOX 247 — PHONE 632-7410
HUMBOLDT, ARIZONA 86329

REGISTERED ASSAYER
No. 2978
WALTER G. STATLER
ARIZONA, U.S.A.

Henry Valentine

Sept. 16, 1951

	SAMPLE DESCRIPTION		OZ/TON Au	OZ/TON Ag	% Cu		
70	Hole #4	145-150	Tr	0.05	0.05		
71	Hole "D" continued	150-155	Nil	Nil	0.03		
72		155-160	Tr	0.06	0.03		
73		160-165	Tr	0.04	0.03		
74		165-170	Tr	0.06	0.03		
75		170-175	Tr	0.04	0.04		
76	~~Hole #5~~ Hole "E"	15-20	Tr	0.06	0.02	(Hole "E")	
77		55-60	0.012	0.06	0.03		
78	Silicate		Tr	0.06	1.42		

ASSAYER

ASSAY CERTIFICATE

BOX 247 — PHONE 632-7410
HUMBOLDT, ARIZONA 86329

CERTIFICATE NO. 2978
WALTER G. STATLER
Date Signed 10-4-83
ARIZONA, U.S.A.

SAY
DE
R

Henry Valentine, M.D.
1848 N.E. 4th Ave.
Miami, Fla. 33132

Oct. 4, 1983

REF. NO.	DESCRIPTION	oz/ton Au	oz/ton Ag		% Fe	% Pb	% Zn	% Cu
9-10	83 # 2 95-100 →	0.032	Nil	Hole	"B"	---		0.10
-11	83 # 2 195-200 →	0.028	Nil	"	"			0.14
-12	83 # 2 260-265	0.002	0.02	"	"			0.07
-13	83 # 2 295-300	0.002	1.90	"	"			0.05
-14	83 # 2 1010-1015	0.002	Nil	Hole	"C"	--		0.06
-15	83 # 2 1015-1020	Tr	Nil	"	"			0.07

ARGES $85.50 Pd

ASSAYER

SKYLINE LABS, INC.
1775 W. Sahuaro Dr. • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

REPORT OF ANALYSIS

JOB NO. UON 001
October 28, 1983
PROJECT NO. 83
SHIPMENT NO. 1

HENRY VALENTINE, M.D.
1848 N.E. 4th. Avenue
Miami, Florida 33132

Analysis of 112 Rock Chip and Soil Samples

	ITEM	SAMPLE NUMBER	Au (ppm)	Ag (ppm)	Cu (ppm)
Hole "C"	1	810-815	<.02	<.2	30.
	2	815-820	<.02	<.2	65.
	3	820-825	<.02	<.2	250.
	4	825-830	<.02	<.2	45.
	5	830-835	<.02	<.2	30.
	6	835-840	<.02	<.2	80.
	7	840-845	<.02	<.2	30.
	8	845-850	.12	<.2	760.
	9	850-855	<.02	<.2	520.
	10	855-860	<.02	<.2	165.
	11	860-865	<.02	<.2	110.
	12	865-870	<.02	<.2	230.
	13	870-875	<.02	<.2	110.
	14	875-880	<.02	<.2	80.
	15	880-885	<.02	<.2	65.
	16	885-890	<.02	<.2	75.
	17	890-895	<.02	<.2	130.
	18	895-900	<.02	<.2	205.
	19	900-905	<.02	<.2	155.
	20	905-910	<.02	<.2	75.
	21	910-915	<.02	<.2	60.
	22	915-920	<.02	<.2	50.
	23	920-925	<.02	<.2	50.
	24	925-930	<.02	<.2	200.
	25	930-935	<.02	<.2	95.

1775 W. Sahuaro Dr. • P.O. Box 30100
Tucson, Arizona 85703
(602) 622-4836

JOB NO. LION 001
October 28, 1983

	ITEM	SAMPLE NUMBER	Au (ppm)	Ag (ppm)	Cu (ppm)
Hole C continued	26	935-940	<.02	<.2	60.
	27	940-945	<.02	<.2	40.
	28	945-950	<.02	<.2	30.
	29	950-955	<.02	<.2	15.
	30	955-960	<.02	<.2	15.
	31	960-965	<.02	<.2	50.
	32	965-970	<.02	<.2	90.
	33	970-975	<.02	<.2	100.
	34	975-980	<.02	<.2	35.
	35	980-985	<.02	<.2	80.
	36	985-990	<.02	<.2	40.
	37	990-995	<.02	<.2	25.
	38	995-1000	<.02	<.2	25.
	39	1000-1005	<.02	<.2	45.
	40	1005-1010	<.02	<.2	20.
	41	1010-1015	<.02	<.2	50.
	42	1020	<.02	<.2	30.
Hole "B"	43	0-5	<.02	<.2	135.
	44	05-10	<.02	<.2	95.
	45	10-15	<.02	<.2	175.
	46	15-20	<.02	<.2	25.
	47	20-25	<.02	<.2	330.
	48	25-30	<.02	<.2	40.
	49	25-30	<.02	<.2	35.
	50	30-35	<.02	<.2	15.

1775 W. Sandaro Dr. • P.O. Box 30100
Tucson, Arizona 85703
(602) 622-4836

JOB NO. UON 001
October 28, 1983

	ITEM	SAMPLE NUMBER	Au (ppm)	Ag (ppm)	Cu (ppm)
Hole "B" Continued	51	35-40*	.00*	.0*	0.*
	52	40-45	<.02	<.2	10.
	53	40-45?	<.02	<.2	10.
	54	?45-50	<.02	<.2	40.
	55	45-50?	<.02	<.2	35.
	56	50-55 TAG	<.02	<.2	10.
	57	50-55	<.02	<.2	50.
	58	?55-60	<.02	<.2	35.
	59	60-65	<.02	<.2	20.
	60	65-70*	.00*	.0*	0.*
	61	70-75*	.00*	.0*	0.*
	62	75-80*	.00*	.0*	0.*
	63	80-85*	.00*	.0*	0.*
	64	85-90*	.00*	.0*	0.*
	65	90-95*	.00*	.0*	0.*
	66	95-100	<.02	<.2	110.
	67	100-105	<.02	<.2	40.
	68	105-110	<.02	<.2	25.
	69	110-115	<.02	<.2	15.
	70	115-120	<.02	<.2	10.
	71	120-125	<.02	<.2	25.
	72	125-130	<.02	<.2	45.
	73	130-135	<.02	<.2	50.
	74	135-140	<.02	<.2	25.
	75	140-145	<.02	<.2	10.

Tucson, Arizona 85703
(602) 622-4836

JOB NO. UON 001
October 28, 1983

	ITEM	SAMPLE NUMBER	Au (ppm)	Ag (ppm)	Cu (ppm)
Hole B Continued	76	145-150	<.02	<.2	20.
	77	150-155	<.02	<.2	40.
	78	150-155	<.02	<.2	50.
	79	155-160	<.02	<.2	95.
	80	160-165*	.00*	.0*	0.*
	81	165-170	<.02	<.2	10.
	82	170-175	<.02	<.2	25.
	83	175-180	<.02	<.2	15.
	84	180-185	<.02	<.2	25.
	85	185-190	<.02	<.2	10.
	86	190-195	<.02	<.2	<5.
	87	195-200	<.02	<.2	10.
	88	200-205	<.02	<.2	15.
	89	205-210	<.02	<.2	5.
	90	210-215	<.02	<.2	<5.
	91	215-220	<.02	<.2	5.
	92	220-225	<.02	<.2	10.
	93	225-230	<.02	<.2	<5.
	94	230-235	<.02	<.2	30.
	95	235-240	<.02	<.2	60.
	96	240-245	<.02	<.2	40.
	97	245-250	<.02	<.2	55.
	98	250-255	<.02	<.2	95.
	99	255-260	<.02	<.2	90.
	100	260-265	<.02	<.2	75.

1775 W. Sahuaro Dr. • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

JOB NO. UON 001
October 28, 1983

	ITEM	SAMPLE NUMBER	Au (ppm)	Ag (ppm)	Cu (ppm)
Hole B Continued	101	265-270	<.02	<.2	60.
	102	270-275	<.02	<.2	1050.
	103	275-280	<.02	<.2	860.
	104	280-285	<.02	<.2	465.
	105	285-290	<.02	<.2	445.
	106	290-295	<.02	<.2	265.
	107	295-300	<.02	<.2	25.
	108	A-81	<.02	<.2	30.
	109	B-81	<.02	<.2	325.
	110	C-81	<.02	<.2	5.
	111	D-81	<.02	<.2	30.
	112	E-81	<.02	<.2	15.
	113	A	<.02	<.2	25.
	114	B	<.02	<.2	20.
	115	C	<.02	<.2	35.
	116	D	<.02	<.2	455.
	117	E	<.02	<.2	40.
	118	F	<.02	<.2	15.
	119	G	<.02	<.2	45.
	120	H	<.02	<.2	60.

*NOTE: The following samples were not received.
Item No. 60 Sample No. 65-70.
Item No. 61 Sample No. 70-75.
Item No. 62 Sample No. 75-80.
Item No. 63 Sample No. 80-85.
Item No. 64 Sample No. 85-90.
Item No. 65 Sample No. 90-95.
Item No. 80 Sample No. 160-165.
Item No. 51 Sample No. 35-40.

William E. Lehmbeck
Manager

INDUCED POLARIZATION AND RESISTIVITY SURVEY MONARCH MINE PROJECT YAVAPAI COUNTY, ARIZONA

FOR

DR. HENRY E. VALENTINE, JR.

mining
geophysical surveys

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SURVEY PROCEDURE	1
DESCRIPTION OF DATA	3
SUMMARY	5

ACCOMPANYING THIS REPORT:

2 PROFILES

1 EXPANDER PLOT

1 GEOPHYSICAL PLAN MAP

DISTRIBUTION:

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1 copy: Mr. Gerald Weathers

INDUCED POLARIZATION AND
RESISTIVITY SURVEY
MONARCH MINE PROJECT
YAVAPAI COUNTY, ARIZONA

FOR

DR. HENRY E. VALENTINE, JR.

INTRODUCTION:

During the period September 5 through 10, 1972 an induced polarization and resistivity survey was performed on the titled property. The field survey was under the direction of Michael G. Sayovitz, geophysical engineer for Mining Geophysical Surveys.

Two reconnaissance profiles were surveyed across the Monarch Mine patented claims. These lines suggest that a broad anomalous response occurs at a depth of 2000'±. The response is moderate in amplitude calculated at 35 to 45 ms (average) at the stated depth. Drilling (with reservations) is suggested to define the cause of the response. An expander profile in the vicinity of prospect pits did not indicate the presence of sulfide mineralization in substantial volume.

SURVEY PROCEDURE:

The induced polarization and resistivity measurements are made in the time-domain mode of operation. A conventional

system of measurements which uses a time cycle of 2.0 seconds "on" and 2.0 seconds "off" - 2.0 seconds "on" and 2.0 seconds "off" (current reversed) was employed.

The commencement of the measurement of the secondary voltage is delayed by 0.45 seconds to avoid coupling and other transient effects. The integration is performed during the period from 0.45 seconds to 1.10 seconds after the cessation of current.

To conform to a standard presentation, the integral time constant is adjusted to give induced polarization readings equivalent to those obtained with transmitter cycles of 3.0 seconds "on" and 3.0 seconds "off", with integration of the secondary voltage during the first second of the "off" period.

For this survey a conventional inline dipole-dipole array of seven electrodes was used, with dipole length "a" of 1000'. Measurements were made for dipole separation factors "n" of 1 to 6. The potential dipoles occupy positions on both sides of the current-electrode spread, thereby obtaining a total line coverage of approximately nine times the dipole length for a standard line of seven electrodes. In addition to the profiles, a dipole-dipole expander test was performed using a dipole spacing "a" of 100' and expanding west from two current dipoles.

Apparent polarization response is in units of millivolt-seconds per volt, or milliseconds (ms), and apparent resistivity

is in units of ohmmeters. The data from each line is plotted in quasi-section to facilitate presentation of the data at all spacings used.

DESCRIPTION OF DATA:

LINE 1 "a" = 1000'

Background induced polarization response of 14-16 ms occurs throughout the line with increasing response with depth in the area from about electrode C_1 to C_5. A solution of the data indicates an interface at a depth of 2000'± below which anomalous response of 35 to 60 ms occurs. The spread in calculated response is due to the assumed variation in background response of 14 to 16 ms and resistivity contrast P_2/P_1 of from 2.0 to 5.0.

Resistivity values increase at the larger dipoles suggesting a resistivity contrast of greater than 1.0. Relatively near-surface variations in resistivity across the line tend to destroy the layered resistivity character at depth if it does exist!

LINE 2 "a" = 1000'

Background response of 12 ms occurs in the east half of the line extending to depth without significant change (effective depth of penetration 2000'). An increase in response at depth is evident in the west half and is somewhat similar to

that seen on Line 1, but slightly lower in overall apparent amplitude. A layer solution indicates an anomalous response of 32 to 37 ms at a depth of 1500' to 1800'. The solution is somewhat suspect since the contour pattern expresses a broad finite body rather than a layered case. A finite body solution suggests a dike-like response zone at a depth of 1000'+, having a width of 1 to 2 dipoles or 1000'-2000' across and a true response of 44 ms±. This solution is not too drastically different from the layered case.

LINE 2 "a" = 2000'

Since the anomalous response occurs at a considerable depth and in high resistivity material, the dipole spacing was increased to obtain a better definition of the buried response.

This information confirms the position of the response as seen on Line 2, "a" = 1000', and indicates a response at about the same level as suggested by the above interpretations. In the interests of time and costs, the 2000' data was not filled out completely.

The larger dipole spacing affords us with greater coverage and, interestingly, anomalous response is suggested to be 4000' to 5000' east of our electrode C_7 on this line. The incomplete coverage, however, does not provide us with the interpreted limits of this anomaly.

LINE 3 "a" = 100'

A short expander test in the area of surface showings, gossans, etc., was run at no extra cost and as a matter of academic interest. No anomalous response is indicated in the area.

The test is admittedly limited in scope; however, one suspects that at least in the area from electrode C_1 and west for 200' to 300', there are no sulfide occurrences in volume quantity.

SUMMARY:

Moderate anomalous response is indicated to underly the Monarch Mine area. The extent of this response has not been mapped except that the response zone is substantially smaller on Line 2 than Line 1.

It is not within the capability of geophysical engineering to suggest the economic potential of IP response - nor is it valid to state that this response is more or less interesting because it compares or lacks comparison with published case histories. We suggest that the response material must be geologically identified before the true value can be ascertained. Drilling is the only absolute way of testing this feature, and prior to drilling it would be prudent to survey a line

north of Line 1, and perhaps a N-S line as well, to observe the nature and extent of the anomaly to the north.

Respectfully submitted,

MGSayovitz/nsw

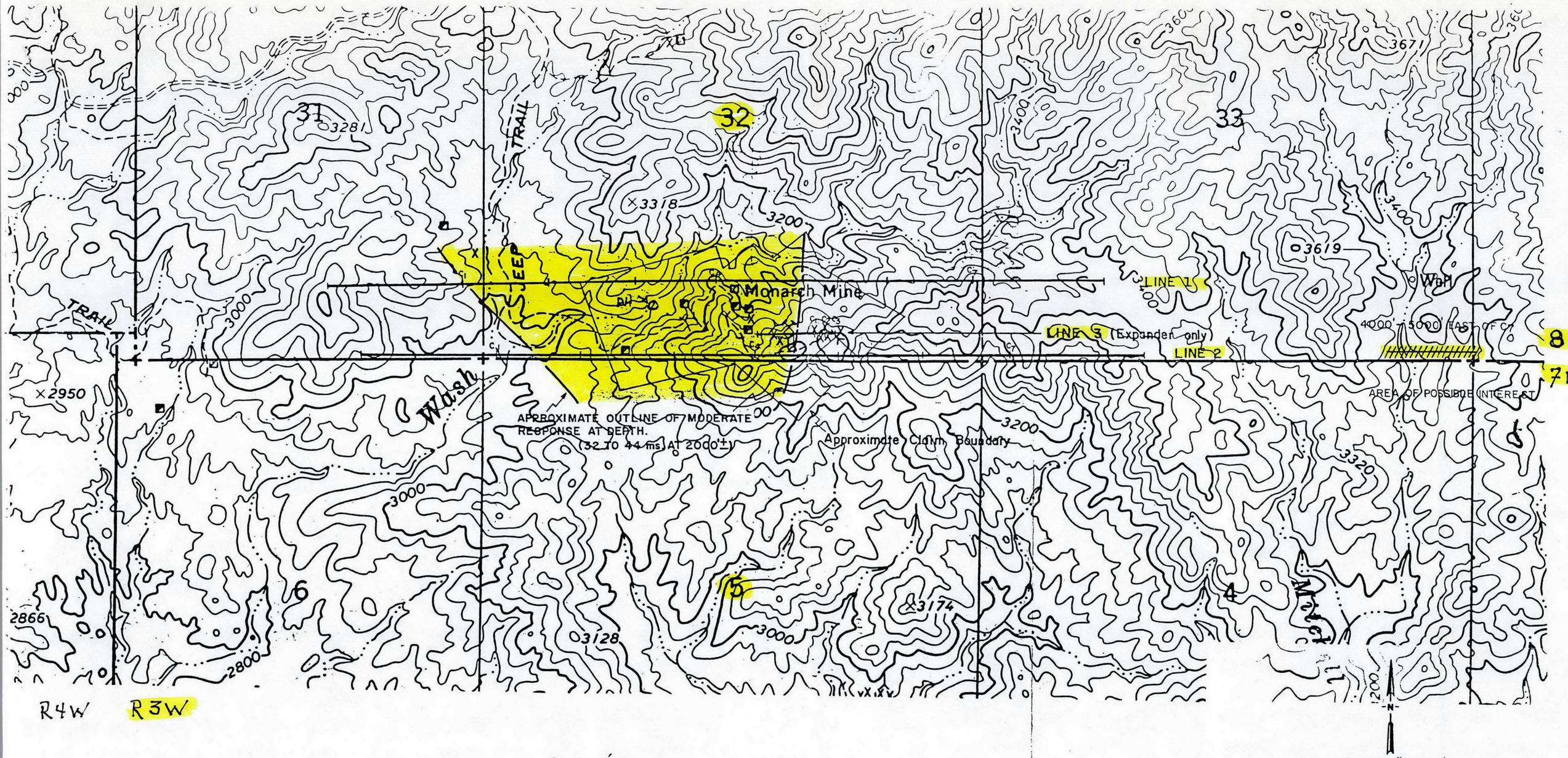
Michael G. Sayovitz
Geophysical Engineer

W. Gordon Wieduwilt

W. Gordon Wieduwilt
Geophysicist

October 11, 1972

Tucson, Arizona



DH Site according to SP scale 9/15/91

I.P. and RESISTIVITY SURVEY

PLAN MAP

MONARCH MINE PROJECT

YAVAPAI COUNTY, ARIZONA

for

DR. HENRY E. VALENTINE, JR.

by

mining geophysical surveys

0242

TIME DOMAIN INDUCED POLARIZATION AND RESISTIVITY SURVEY

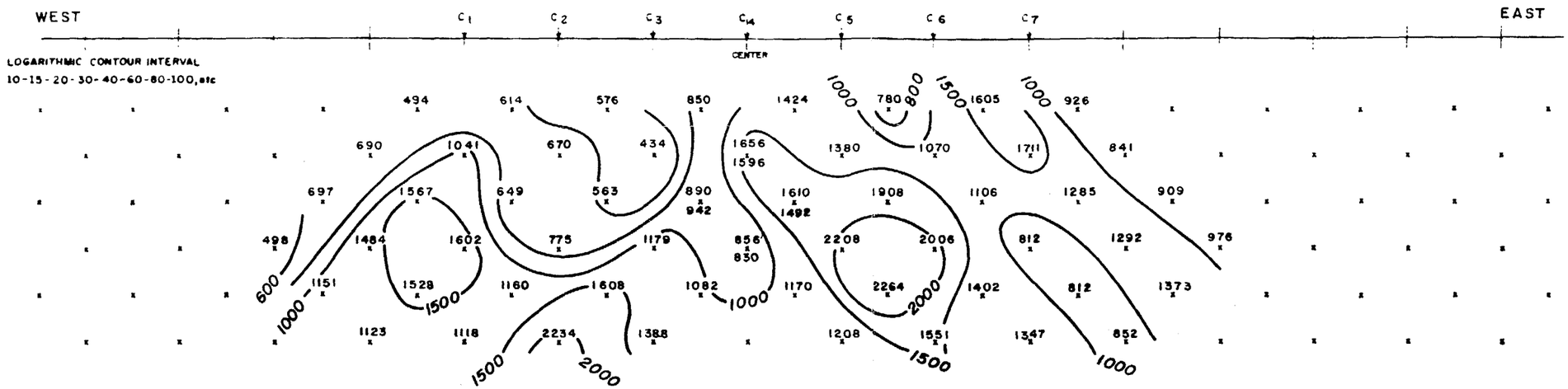
MONARCH MINE PROJECT—YAVAPAI COUNTY, ARIZONA

FOR

DR. HENRY E. VALENTINE, JR.

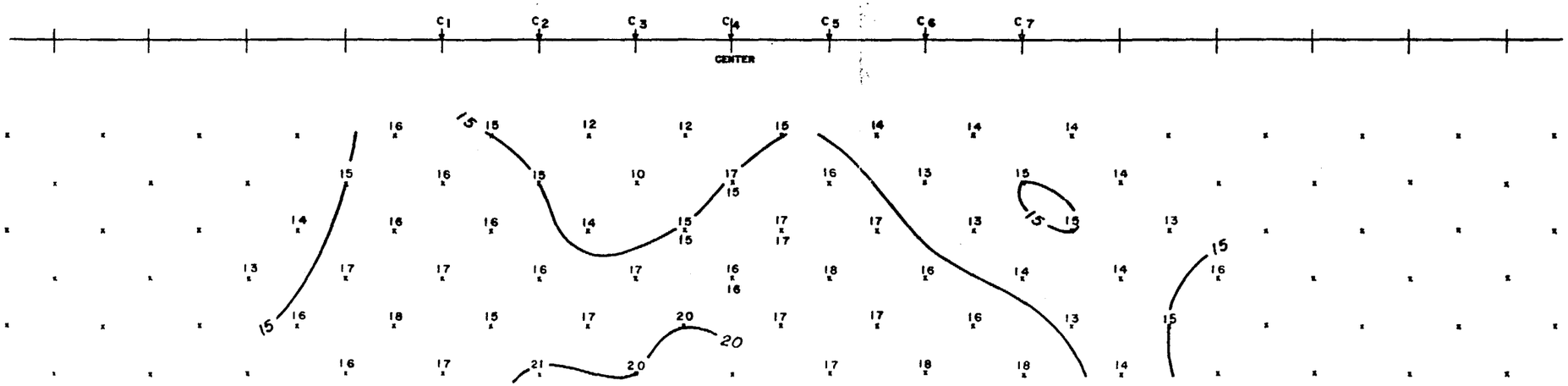
APPARENT RESISTIVITY

ohm meters

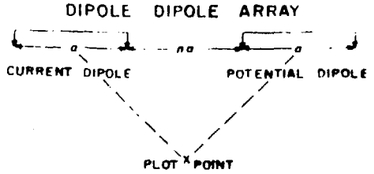


APPARENT POLARIZATION

millivolt seconds/volt



DIPOLE DIPOLE ARRAY



LINE: 1

LOOKING . . . NORTH

DIPOLE LENGTH: . . . . 1000'

DATE: SEP. 6/1972

LEGEND

FENCE. . . . . .

PIPELINE . . . .

POWERLINE. . . . .

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TIME DOMAIN INDUCED POLARIZATION AND RESISTIVITY SURVEY

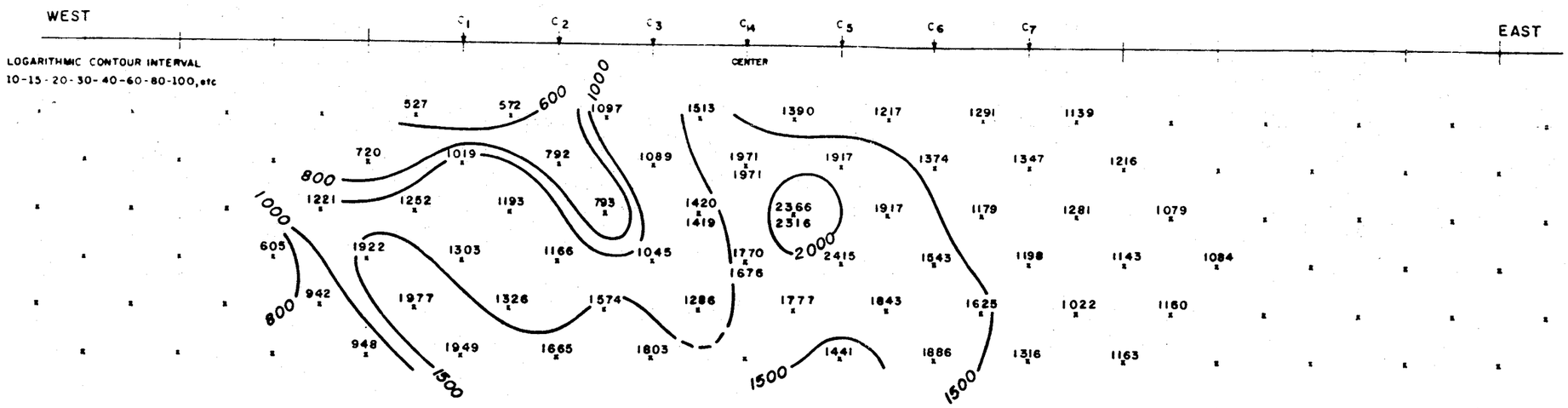
MONARCH MINE PROJECT – YAVAPAI COUNTY, ARIZONA

FOR

DR. HENRY E. VALENTINE, JR.

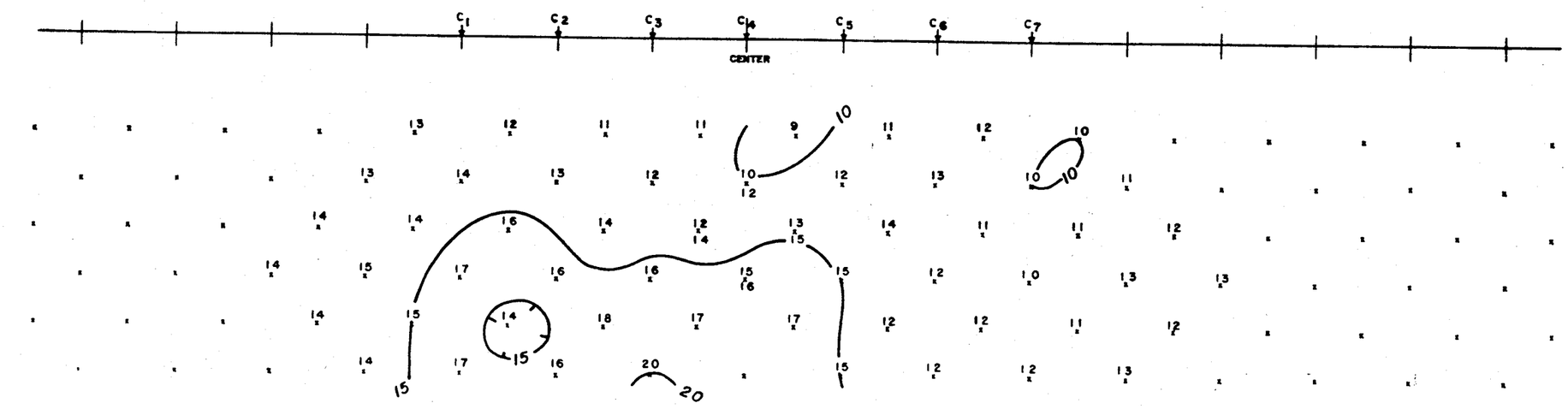
APPARENT RESISTIVITY

ohm meters

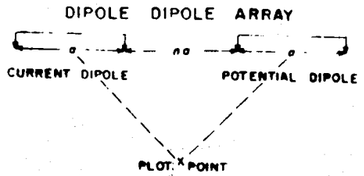


APPARENT POLARIZATION

millivolt seconds/volt



DIPOLE DIPOLE ARRAY



LINE 2

LOOKING . . NORTH

DIPOLE LENGTH . . .1000'

DATE SEP. 8/1972

LEGEND

FENCE . .

PIPELINE

POWERLINE

ROAD, RR.

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TIME DOMAIN INDUCED POLARIZATION AND RESISTIVITY SURVEY

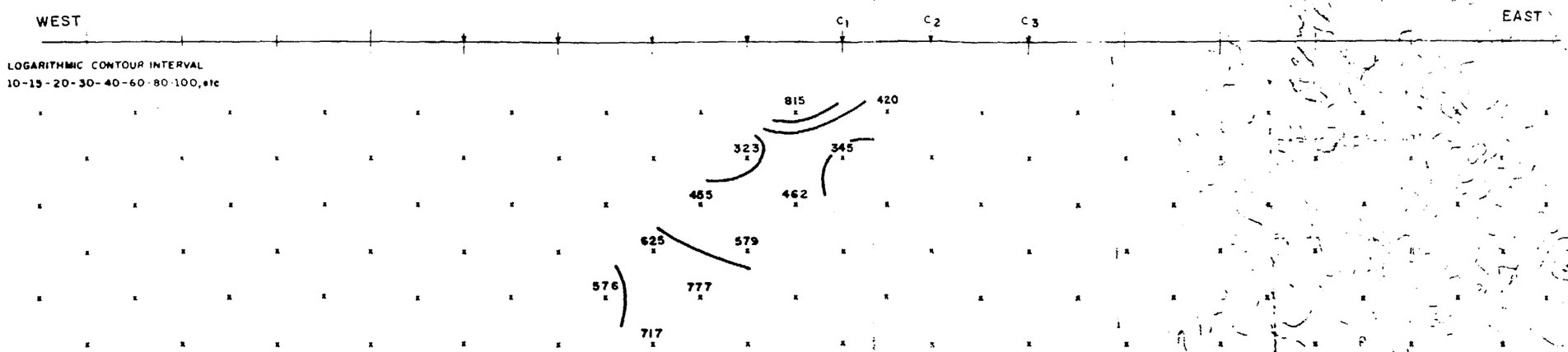
MONARCH MINE PROJECT – YAVAPAI COUNTY, ARIZONA

FOR

DR. HENRY E. VALENTINE, JR.

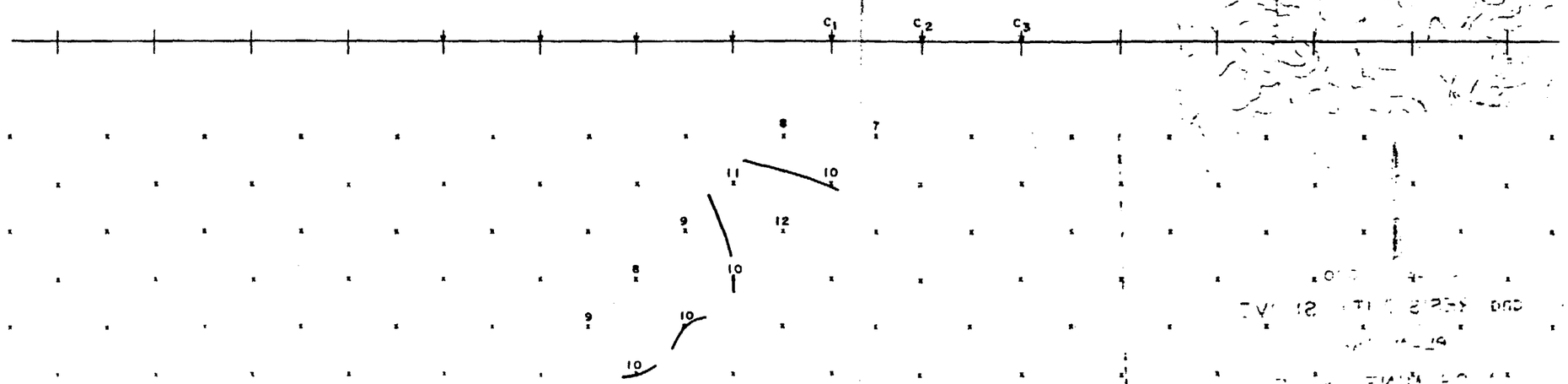
APPARENT RESISTIVITY

ohm meters

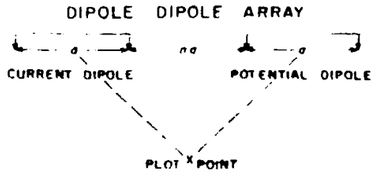


APPARENT POLARIZATION

millivolt seconds/volt



DIPOLE DIPOLE ARRAY



LINE 3

LOOKING . . NORTH

DIPOLE LENGTH . . . . 100'

DATE

LEGEND

FENCE

PIPELINE

POWERLINE

ROAD, RR.

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JDS

Geologic Map of the Wickenburg, southern Buckhorn, and northwestern Hieroglyphic Mountains, central Arizona

James A. Stimac, Joan E. Fryxell, Stephen J. Reynolds,
Stephen M. Richard, Michael J. Grubensky, and Elizabeth A. Scott

Arizona Bureau of Geology and Mineral Technology

October, 1987

Arizona Bureau of Geology and Mineral Technology
Open-File Report 87-9

This report is preliminary and has not been edited or reviewed for conformity with Arizona Bureau of Geology and Mineral Technology standards.

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INTRODUCTION

This report describes the geology of the Red Picacho quadrangle and parts of the Wickenburg, Garfias Mountain, and Wittmann quadrangles (Fig. 1). Geologic mapping was completed between January and April of 1987, and was jointly funded by the U.S. Geological Survey and the Arizona Bureau of Geology and Mineral Technology as part of the cost-sharing COGEOMAP program. Mapping was done on 1:24,000-scale topographic maps and on 1:24,000-scale color aerial photographs provided by Raymond A. Brady of the U.S. Bureau of Land Management.

GEOLOGIC OVERVIEW

The map area includes the Wickenburg Mountains and contiguous parts of the Buckhorn and Hieroglyphic Mountains (Fig. 1). Adjacent parts of the Vulture Mountains were mapped by Grubensky and others (1987) and adjacent parts of the Hieroglyphic Mountains were mapped by Capps and others (1986). The overall geologic history of the area is complex, but the regional stratigraphy developed in these reports carries well from range to range.

The map area is composed of a metamorphic-plutonic basement unconformably overlain by Tertiary volcanic and sedimentary rocks. The oldest rocks, assigned to the Proterozoic (1.8-1.7 b.y.) Yavapai Supergroup, consist of amphibolite, schist, and gneiss, intruded by granite, leucogranite, and pegmatite. Protoliths for the amphibolite, schist, and gneiss include both volcanic and sedimentary rocks.

Proterozoic rocks are intruded by Late Cretaceous granodiorite, granite, pegmatite, and aplite. Basement rocks are cut by numerous felsic and mafic dikes and sills related to Tertiary volcanism. In places, these dikes account for more than half of the outcrop area.

Crystalline basement rocks are unconformably overlain by Tertiary clastic sedimentary and volcanic rocks. Basal Tertiary deposits usually include a sequence of conglomerate, arkosic sandstone, and thin tuffs. The sedimentary rocks probably represent stream deposits formed shortly before and during early volcanism. Locally, deposition of clastic sedimentary rocks composed almost exclusively of basement lithologies persisted throughout early volcanism, which indicates topographic relief on basement rocks.

Tertiary volcanic and sedimentary rocks of the area can be divided into several temporal-compositional packages of regional extent. Volcanism was strongly bimodal throughout its duration, with basaltic and rhyolitic to dacitic lava flows and related tuffs accounting for at least 90 percent of the eruptive volume of the system. Extensive ash flow tuffs are conspicuously absent in the map area, as they are in the Big Horn Mountains (Capps and others, 1985), northeastern Hieroglyphic Mountains (Capps and others, 1986), and northeastern Vulture Mountains (Grubensky and others, 1987). Rare andesite flows occur interbedded with basaltic sequences.

Early volcanism was dominated by basalt flows, but rhyolitic flows and related tuffs are locally present. Early basalts are overlain by the San

Domingo volcanics, a sequence of phenocryst-poor rhyolite flows and related lithic tuffs. This package is in turn overlain by the Hells Gate volcanics, a thick sequence of porphyritic dacite and rhyodacite flows and related tuffs. The volcanic section is cut by numerous silicic and mafic dikes that served as feeders to the extrusive rocks. Dikes are more abundant in the early erupted basalt and rhyolite flows and tuffs than in the overlying dacite flows and tuffs.

The uppermost dacite flows in the Hells Gate volcanics are interbedded with and overlain by debris flows with clasts derived mainly from the dacite. Many, if not all, of the early debris flows are eruption related. Later debris flows tend to be heterolithologic, and probably formed in response to fault-related tilting and seismic activity.

Debris flows overlying the dacite package are interbedded with olivine-bearing basalts, megabreccia blocks of lower stratigraphic units, and immature fluvial clastic rocks. This complex package is synvolcanic, but grades upward into conglomerate and sandstone typical of post-volcanic sedimentary sequences in nearby ranges. The entire package was deposited in irregular-shaped half grabens that formed during the main episode of extensional faulting.

Structure

Volcanism was accompanied and followed by low- to moderate-angle normal faulting produced by northeast-southwest-oriented regional crustal extension. Major north- to northwest-trending moderate-angle faults, which dip 30 to 50 degrees to the southwest, cut and tilt Tertiary rocks and crystalline basement rocks, producing domino-style repetition of section. The largest of these faults have displacements of several kilometers and produce north to northwest-trending ridges that are usually capped by resistant rhyolite and dacite flows. They cut another set of low-angle faults that dip 5 to 15 degrees to the southwest, and that are common to the eastern Hieroglyphic, Wickenburg, and Vulture Mountains. Northeast- to east-trending complex fault zones probably functioned as boundaries for domains of differential extension and tilting during displacement on both moderate- and low-angle fault sets.

The low-angle faults have fairly irregular surfaces, probably in part due to original corrugations in the faults. They are interpreted as normal faults because they commonly carry tilted Tertiary rocks in their hanging walls, and, where they juxtapose pre-Tertiary crystalline rocks, the intrusive margin of the Cretaceous granite is progressively displaced westward (see cross section B-B').

The change from northwest-striking to north-northeast-striking ridges in the west central Wickenburg quadrangle probably formed as the result of drag on a major low-angle structure that separates basement lithologies from the overlying, steeply tilted Tertiary section. This fault probably has on the order of 5 km of displacement (see cross section C-C').

Evidence that faulting occurred during volcanism includes (1) generally steeper dips on the early volcanic section than on stratigraphically higher units, and (2) fault zones intruded by Tertiary dikes and sills, with local brecciation of dike rocks due to subsequent movement on those faults.

Pre-Tertiary structures in the map area include isoclinal folds within the foliation of the Proterozoic rocks and megascopic open to tight folds that fold the Proterozoic foliation. The foliation-related isoclinal folds are certainly Proterozoic in age, and the megascopic folds are probably also of Proterozoic age.

Mineralization

Precious- and base-metal prospects occur in both the Tertiary volcanic and sedimentary rocks and the crystalline basement. Many of the prospects are localized along low- to moderate-angle faults characterized by intense brecciation and quartz, calcite, and iron-oxide veining. Such mineralization is middle Tertiary in age. Placer gold occurrences are common in several major drainages and their tributaries. The most productive deposits are in the San Domingo, Little San Domingo, and Ox Wash areas. Proterozoic metachert and metacarbonate lenses, interpreted as exhalites, are also potential prospecting targets for gold. Proterozoic Li-bearing pegmatites occur in the upper San Domingo Wash area.

QUATERNARY AND UPPER TERTIARY UNITS

Qs: Younger alluvium

Unconsolidated sand and gravel in modern channels or on adjacent low-lying terraces to these channels.

Qso: Mid-Level alluvium

Unconsolidated gravel-poor sand and sandy gravel deposits in flood plains elevated 0.5 to 2 m above modern channels. Deposits typically host mature mesquite trees.

QTs: Older alluvium

Unconsolidated to semi-consolidated and caliche-cemented sand and gravel deposits that commonly underlie dissected terraces elevated 2 m or more above modern drainages. The deposits are being incised by the present drainages and host palo verde trees, saguaro, and other cacti.

MIDDLE TERTIARY VOLCANIC AND SEDIMENTARY ROCKS

Tertiary rocks of the area overlie crystalline basement and consist of clastic sedimentary rocks, volcanic rocks, debris flows, and fanglomerate and related megabreccia. The volcanic rocks probably range in age from latest Oligocene to early Miocene. The youngest Tertiary rocks are fanglomerates and related megabreccia that accumulated during extensional faulting. Fanglomerate grades downward into a complex sequence of synvolcanic debris flows, megabreccia, clastic sedimentary rocks, thin tuffs, and olivine-bearing basalts. These units are underlain by a series of dacitic to rhyodacitic flows and tuffs, correlative with the Hells Gate volcanics of the northeastern Hieroglyphic Mountains (Ward, 1977; Capps and others, 1986). The Hells Gate volcanics also make up most of the Buckhorn Mountains in the adjacent Garfias Mountain and Copperopolis quadrangles. The Hells Gate volcanics are underlain by the San Domingo volcanics, a series of rhyolite flows and related tuffs.

The San Domingo volcanics are interbedded with, and underlain by a series of basalt flows and conglomeratic to arkosic sandstone lenses. The average thickness of the volcanic pile is roughly 1-2 km.

The volcanic stratigraphy has been subdivided into the following informal units (from youngest to oldest):

1) debris flows, deposited during and after the Hells Gate volcanics;

2) upper basalt flows, deposited during and after the Hells Gate volcanics;

3) upper tuffs, deposited after the Hells Gate volcanics;

4) Hells Gate volcanics, composed of dacite and rhyodacite flows, tuffs, and debris flows;

5) San Domingo volcanics, composed of rhyolite flows and tuffs;

6) lower basalt, basaltic andesite, and andesite flows; and

7) clastic sedimentary rocks, deposited prior to, during, and after volcanism.

A general stratigraphic section is shown in Figure 2. More detailed stratigraphic sections of the San Domingo Peak area and the Red Picacho area are shown in Figures 3 and 4, respectively.

Tf: Fanglomerate

Brown- to buff-colored consolidated to semi-consolidated conglomerate, sandstone, and siltstone with a discontinuous thin cover of QTs. Fanglomerate grades downward into tilted sheet-flood deposits and debris flows with interbedded basalts and thin upper tuffs.

Fanglomerate usually forms low hills with little or no outcrop, but steep cliffs 5 to 20 m occur along major washes in the Wickenburg quadrangle. The deposits are flat lying to moderately tilted.

Tbx: Megabreccia and sedimentary breccia; protolith of breccia indicated in parentheses where known

Shattered landslide blocks (megabreccia derived from various older rock units). Megabreccia blocks are locally associated with debris flows and fanglomerate.

Tut: Upper tuffs

Purplish-brown to lavender poorly to moderately welded lithic-rich ash flow tuffs. Phenocrysts includes 5 to 15 percent biotite and hornblende (1-4 mm) and 1 to 5 percent plagioclase (1-4 mm). The tuffs contain 25 to 40 percent lithic fragments, mainly consisting of Hells Gate volcanics and upper basalt. They reach maximum thicknesses of 10-20 m in the upper San Domingo Wash area, forming moderately steep ledges and slopes. The tuffs are interbedded with upper basalts and debris flows.

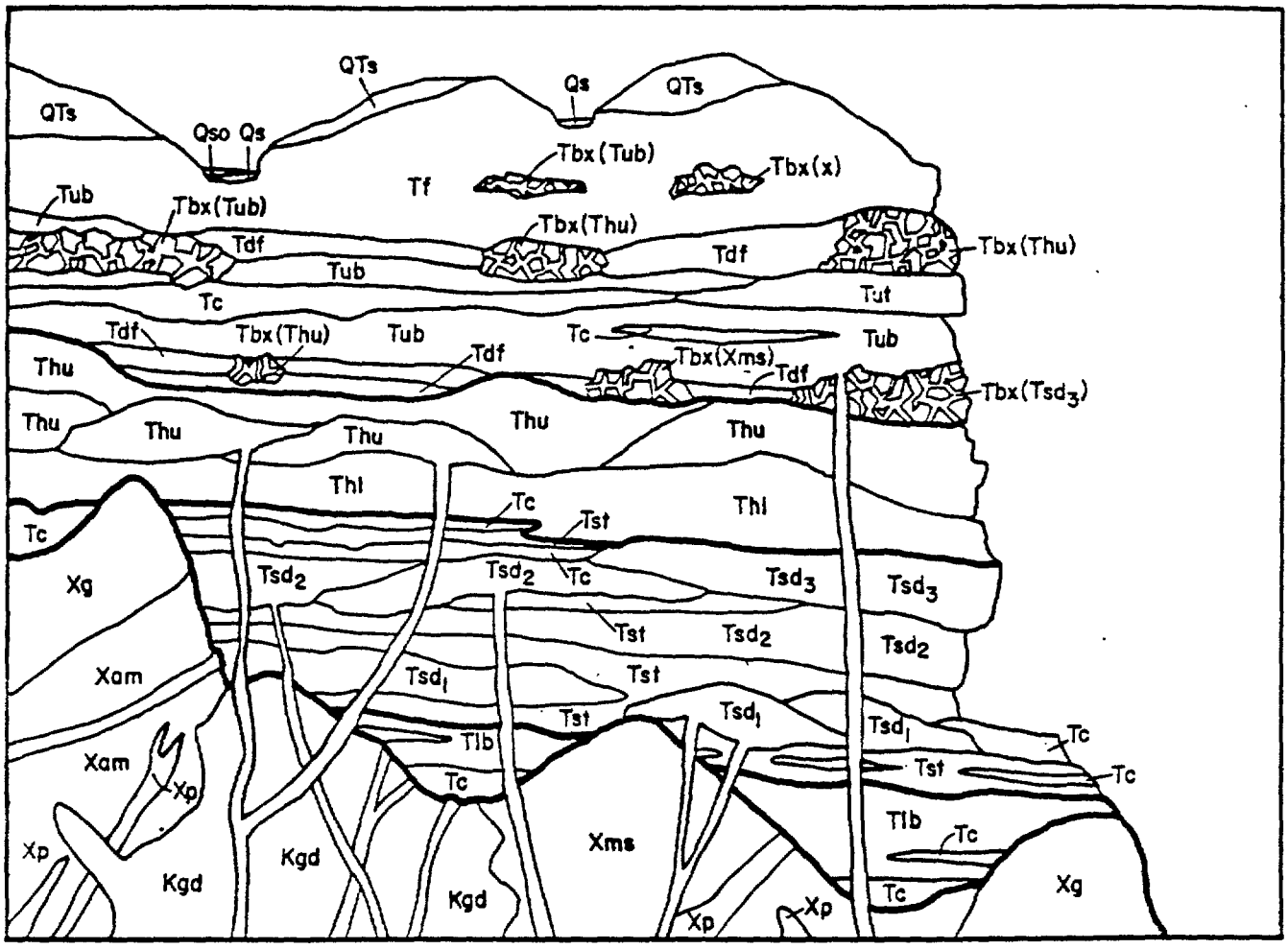

Figure 2. General schematic stratigraphic section for the Wickenburg, southern Buckhorn, and northwestern Hieroglyphic Mountains.

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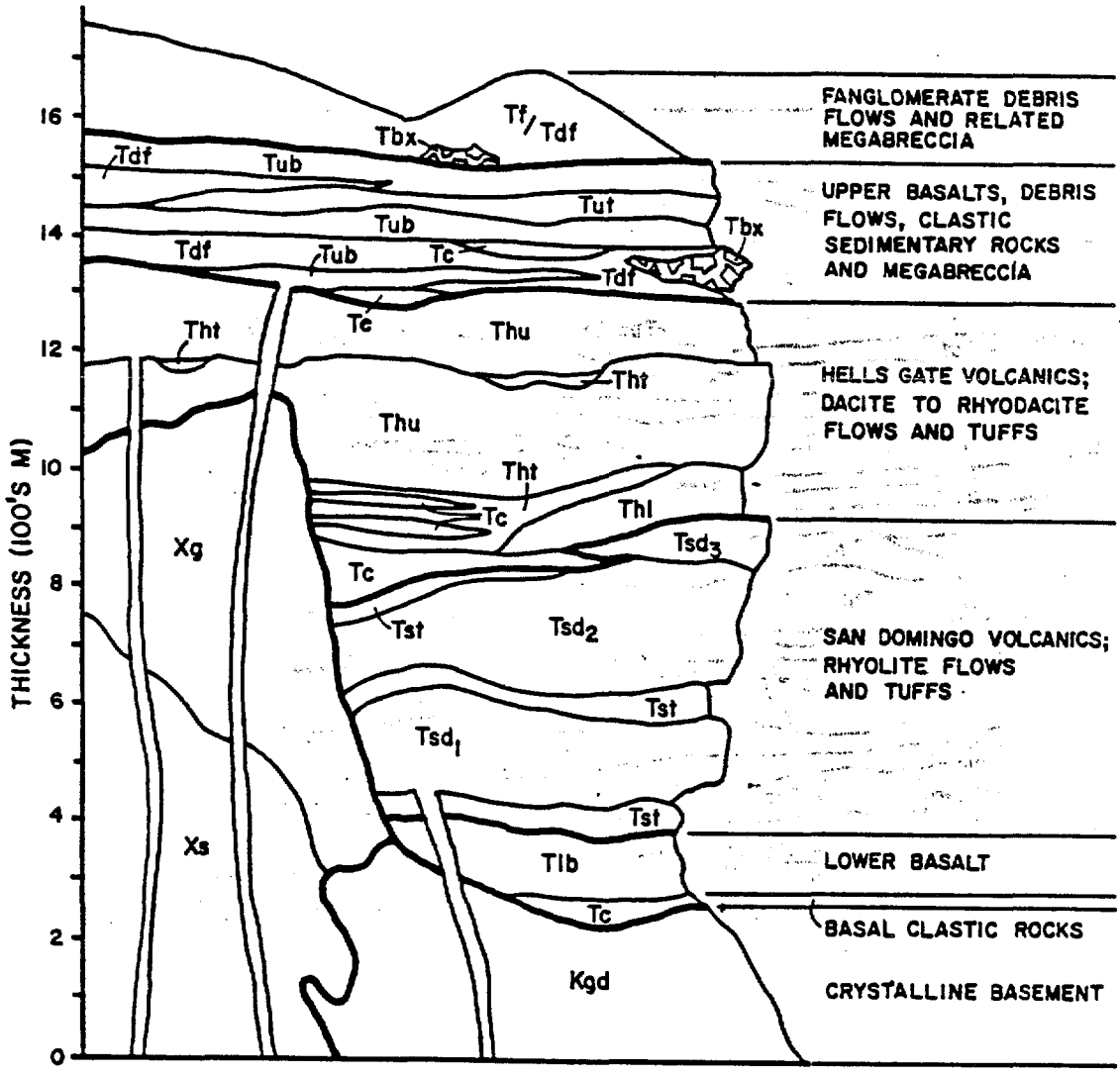

Figure 3. Schematic stratigraphic section for the San Domingo Peak area.

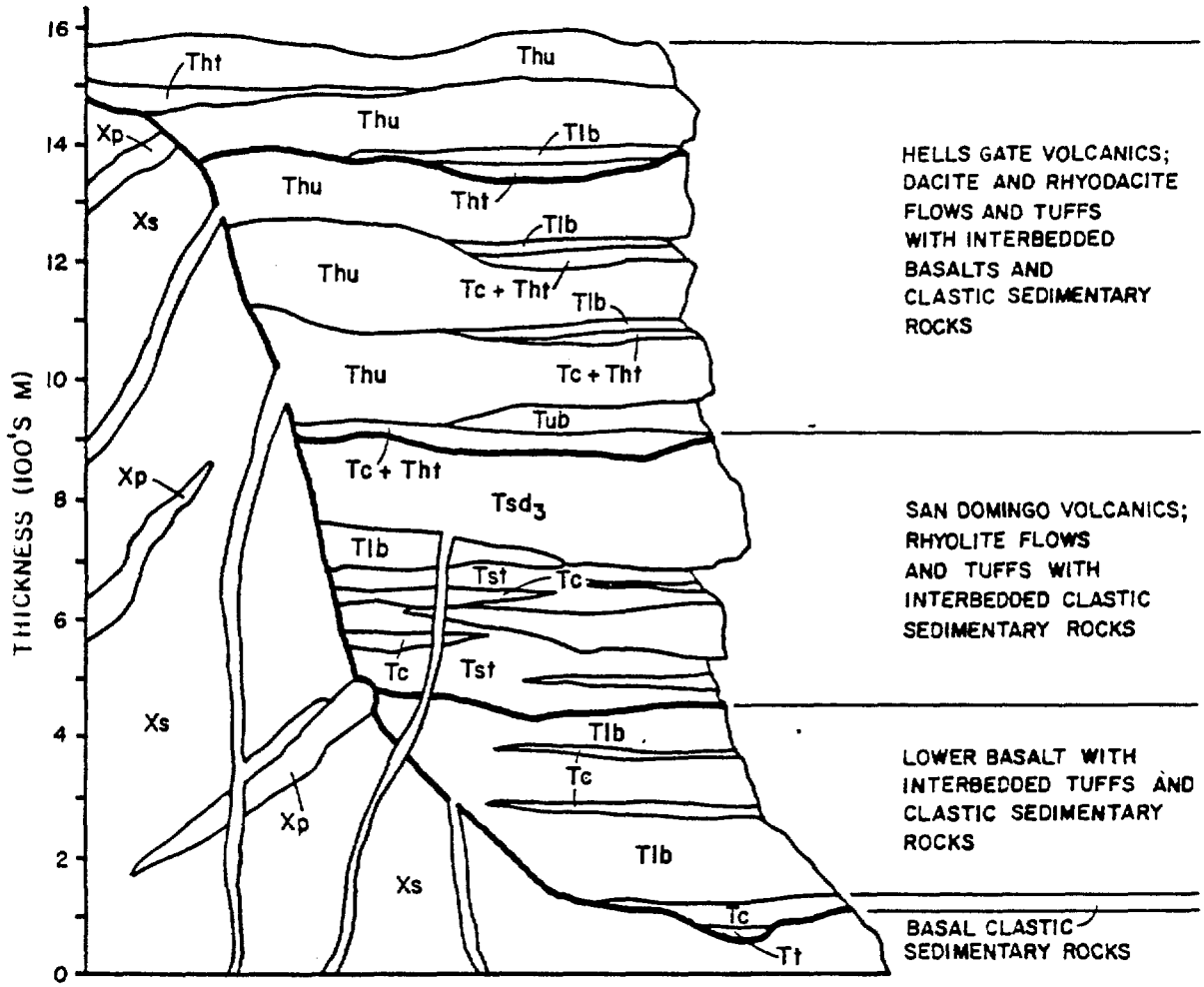

Figure 4. Schematic stratigraphic section for the Red Picacho and White Picacho area.

Tub: Upper basalts

Black to gray basalt flows. These flows contain up to 25 percent phenocrysts including 5 to 20 percent olivine (1-6 mm), trace to 10 percent clinopyroxene (1-8 mm), trace to 10 percent plagioclase (2-6 mm), and 1 to 5 percent opaque oxide minerals (1-5 mm).

Individual flows are usually thin (2-5 m) with well-developed agglomerate horizons at flow contacts. They are stratigraphically equivalent with the upper aphyric basalts in the Bighorn Mountains, dated at 16.1 Ma (Capps and others, 1985) and upper basalts in the northeastern Hieroglyphics, dated at 16.2 Ma (Capps and others, 1986).

Tdf: Debris flows and avalanche deposits

Tan, pinkish, and white massively bedded, unsorted, matrix-supported debris flow and avalanche deposits. They contain clasts of volcanic and crystalline basement rocks, but are usually dominated by a specific lithology, especially Hells Gate dacites and upper olivine-bearing basalts.

The debris flows are interbedded with upper basalts and clastic sedimentary rocks. They form low hills with sporadic outcrop. Good exposures occur along washes and in roadcuts. Individual flows rarely exceed 20 m, but very thick debris flow sequences occur in the Buckhorn, northern Hieroglyphic, and northeastern Wickenburg Mountains. The debris flow sequence grades upward into less consolidated, finer-grained conglomerate, sandstone, and siltstone.

In the San Domingo Peak area, debris flows composed mainly of fragments of Hells Gate dacite are interbedded with megabreccias of first-erupted Hells Gate dacite and older lithologies. These megabreccias show internal shattering and are interpreted as landslide-avalanche deposits related to tilting during faulting.

In the southern Buckhorn Mountains, large (up to several hundred meters) blocks of dacite flow rock is surrounded by massive, unsorted matrix. Blocks do not show internal shattering characteristic of megabreccias associated with faulting and are interpreted either as interbedded dacite flows or rockslide-avalanche deposits intimately associated with eruptions of dacite lavas.

Th: Hells Gate volcanics

Pink, gray, purple-gray, and reddish-brown phenocryst-rich dacite and rhyodacite flows and related tuffs and debris flows. The unit name is carried over from mapping by Capps and others (1986) in the northeastern Hieroglyphic Mountains. The unit has yielded dates of 17.98 Ma in the northern Buckhorn Mountains (Shafiqullah and others, 1980) and 17.4 and 16.1 Ma in the northeastern Hieroglyphic Mountains (Capps and others, 1986; Kortemeier and others, 1986). The Hells Gate volcanics are divided into two informal members based on phenocryst size and abundance. The lower Hells Gate flows are finer grained and less phenocryst-rich than the upper Hells Gate flows.

Thl: Lower Hells Gate flows

Pink, orangish-brown, and reddish-brown porphyritic rhyodacite flows. Phenocrysts include 5 to 10 percent plagioclase (1-3 mm), 10 to 15 percent hornblende (1-2 mm), less than 5 percent biotite (1-3 mm), trace clinopyroxene (1-2 mm), and less than 2 percent opaque oxide minerals (0.5-1 mm).

Hornblende and biotite phenocrysts are strongly oriented along flow foliation.

These flows appear to be transitional in mineralogy between the rhyolites of the San Domingo volcanics and the upper Hells Gate dacites. They mark the first major appearance of hornblende and biotite (greater than 2 percent), and signal an increase in both the crystallinity and size of phenocrysts in the eruptive sequence.

Thu: Upper Hells Gate dacite and rhyodacite flows

These flows contain from 20 to 45 percent phenocrysts with younger flows generally being most phenocryst rich. Phenocryst assemblages usually include 10 to 20 percent plagioclase (2 mm-1.5 cm), 5 to 15 percent biotite and hornblende (2-8 mm), trace to 3 percent clinopyroxene (1- 3 mm and in cumulophyric clumps with plagioclase), 1 to 3 percent opaque oxide minerals (1-3 mm), and trace to 2 percent quartz (2-5 mm). Quenched mafic inclusions are common in the early dacites, especially in the Red Picacho area.

Tht: Hells Gate tuffs

White, pinkish, and buff-colored lithic-rich tuffs. Phenocrysts include 10 to 25 percent feldspar and 10 to 20 percent biotite and hornblende. Lithic fragments are mainly of Hells Gate flows and olivine-bearing basalts. Most of the tuffs are thin, but thicknesses up to 40 m occur in a paleovalley at the extreme northwestern corner of the Garfias Mountain quadrangle.

The Hells Gate volcanics form major ridges and cliffs in the Red and White Picacho area, and throughout the Buckhorn Mountains. The average thickness of the unit is approximately 200 to 500 m.

Tsd: San Domingo volcanics

Brown, purplish-brown, reddish-brown, pink, and gray aphyric and phenocryst-poor rhyolite flows. These flows are characterized by flow brecciated bases with very poorly preserved vitrophyre, and flow-banded bodies that grade upward into lithophysae-rich tops. The flow rhyolites form prominent ridges and cliffs throughout the map area. The total thickness of the package averages several hundred meters.

The San Domingo volcanics are stratigraphically equivalent to the Morgan City rhyolite of Capps and others (1986). Rhyolite flows and tuffs are mainly aphyric or crystal poor. Most of the flows in this package are K-metasomatized and are unsuitable for either chemical analysis or K-Ar age dating.

San Domingo volcanics are composed of many coalescing flows and domes, with pyroclastic aprons. At least three informal members can be distinguished locally based on mineralogy:

Tsd_1: Aphyric rhyolite flows.

Tsd_2: Phenocryst-poor rhyolite flows with 5 to 10 percent feldspar (dominantly sanidine 1-4 mm in length) and trace to 2 percent biotite and hornblende (1-3 mm) phenocrysts.

Tsd_3: Quartz-bearing rhyolite flows with 5 to 15 percent feldspar

(dominantly sanidine 1-4 mm in length) and 5-10 percent quartz (1-3 mm).

These flows form major ridges and cap hills east of Trilby Wash. They reach maximum thicknesses of 50 to 150 m in the Red Picacho area, and are present locally as far west as the San Domingo Peak area.

Tst: Lithic tuffs and related sedimentary rocks

White, pink, and buff-colored aphyric to phenocryst-poor lithic ash-flow, surge, and air fall tuffs, and clastic sedimentary rocks derived mainly from volcanic rocks. The tuffs occur in packages and separate individual flow rhyolites. They form poor outcrops compared to the rhyolite flows, making up moderate to steep slopes generally covered by talus of the overlying rhyolite flows. The tuff sequence reaches thicknesses of 40 to 100 m in the San Domingo Peak and upper Trilby Wash areas and includes at least two moderately welded lithic-rich ash flow tuffs. These tuffs form prominent 3 to 10 m ledges in the San Domingo Peak area. One of these tuffs also forms 5 to 15 m ledges underlying Tsd_3 in the upper Trilby Wash area.

Tlb: Lower basalt, basaltic andesite, and andesite flows

Black, gray, brown, and reddish-brown vesicular to massive basaltic to andesitic flows and agglomerate. The phenocryst assemblage and thin, tabular nature of these flows indicate that the vast majority are basaltic in composition, but, rare basaltic andesite and andesite flows are also present. In the map area, the lower basalt sequence reaches a maximum thickness of 200-400 m in the upper Trilby Wash area, near the Maricopa-Yavapai County line.

The mafic flows contain 5 to 30 percent phenocrysts, including 2 to 10 percent olivine (1-4 mm), 2 to 20 percent clinopyroxene (1-6 mm), 2 to 10 percent plagioclase (1-8 mm), and 1 to 5 percent opaque oxide minerals (1-4 mm). Rare flows contain up to 20 percent orthopyroxene megacrysts (5-15 mm).

The mafic flows are interbedded with the first erupted rhyolitic flows and tuffs of the San Domingo volcanics and with clastic sedimentary rocks composed mainly of clasts of basement lithologies. The basalts form slopes with sporadic outcrop and are commonly covered by talus of more resistant overlying rhyolite flows.

The basaltic sequence appears to be part of a regional episode of dominantly basaltic volcanism that preceded and overlapped with silicic volcanism. It is stratigraphically equivalent to the Deadhorse Wash basalt of the Big Horn Mountains and undifferentiated lower basalts of the Hieroglyphic Mountains. The age of this sequence remains poorly constrained, but it is older than 21 Ma in the Big Horn Mountains (Capps and others, 1985), and older than 18.7 Ma in the Hieroglyphic Mountains (Kortemeier and others, 1986).

Ta: Andesite flow

Gray biotite- and hornblende-bearing flow foliated andesite. This distinctive flow occurs in the Red Picacho area, where it reaches a maximum thickness of 30 to 40 m.

Tc: Clastic sedimentary rocks

Reddish-brown, brown, tan, greenish-gray, and white conglomerate, coarse sandstone, and sandstone. Clasts are mainly of Proterozoic and Cretaceous

rocks, but clasts of volcanic units are locally abundant, especially in lenses interbedded with the volcanic section. These deposits unconformably overlie basement rocks and occur interbedded with and overlying the volcanic section. They form moderately resistant ledges and steep slopes. The thickest deposits (20-50 m) occur in the lower Trilby Wash area. Basal deposits rarely exceed 15 m, but clastic lenses from 1 to 10 m occur intercalated with lower basalts, San Domingo volcanics, and debris flows and upper basalts throughout much of the Red Picacho quadrangle.

TERTIARY ALTERATION ZONES

Tqz: Intensely silicified rocks

White to gray intensely silicified rocks composed of fine-grained quartz and chalcedony. These deposits probably represent near-surface levels of fossil hot-spring systems.

Stippled pattern: Hydrothermal alteration

The stippled pattern denotes areas of local and regional hydrothermal alteration characterized by silicification, and argillic or propylitic alteration. Regional hydrothermal alteration has affected much of the northwestern Hieroglyphic Mountains and the adjacent southern Buckhorn Mountains. This alteration is restricted mainly to the lower part of the section and is probably related to emplacement of upper Hells Gate dacite flows. Some of the alteration in crystalline basement rocks may be pre-Tertiary in age.

PRE-TERTIARY ROCK UNITS AND STRUCTURES

Cretaceous intrusive rocks

Granodiorite, granite, aplite, and pegmatite of Late Cretaceous age occurs throughout the map area as well as in adjacent ranges. This intrusive sequence is equivalent with the Wickenburg granodiorite (Rehrig and others, 1980) and granitic rocks in the Big Horn Mountains (Capps and others, 1985). The suite rarely forms good outcrops, weathering to low, grus-covered hills in most areas. However, good outcrops occur in the southeastern corner of the Red Picacho quadrangle. In some areas, mafic minerals have been completely replaced by chlorite and epidote.

The suite includes small aplite and pegmatite bodies that are similar to those found in the Precambrian rocks of the area, but they usually contain less muscovite and little or no tourmaline.

Kgd: Granodiorite

White to gray porphyritic to equigranular granodiorite. The mineral assemblage includes 10 to 25 percent plagioclase, 10 to 25 percent potassium feldspar (either microcline or orthoclase), 5 to 15 percent quartz, 10 to 20 percent biotite, 5 to 20 percent hornblende, 5 percent opaque oxides, and trace sphene and zircon.

Kg: Granite

Gray to white porphyritic to equigranular granite. This unit is similar to the granodiorite, but contains more quartz and less amphibole. Quartz aggregates up to 15 mm in diameter are common in the northern Red Picacho quadrangle.

Kp: Pegmatite

Ka: Aplite

Proterozoic Rocks

Proterozoic rocks in the map area include metavolcanic and metasedimentary rocks, deformed and undeformed granites, and pegmatite dikes and sills. All of these rocks are intruded to varying degrees by Tertiary felsic and mafic dikes. In places, these dikes compose up to about 70 percent of the outcrop area. Even in these highly intruded areas, however, foliation in the Proterozoic rocks remains consistent in orientation.

Xs: Metamorphic Rocks

Metamorphic rocks in the map area are correlative with the Proterozoic Yavapai Supergroup, and appear to be continuations of lithologies found in the southern Bradshaw Mountains. In the most extensive exposures of Proterozoic rocks, in the northern Red Picacho quadrangle, the metamorphic rocks have been divided into two units: a predominantly mafic unit (Xam) and a predominantly pelitic unit (Xms). Both units are heterogeneous, with lithologies interlayered on a scale of tens of meters to a meter or less. This interlayering may be due to original depositional variation or to deformation. In other parts of the map area units Xam and Xms were not mapped seperately, but were mapped as Xs (metamorphic rocks including schist, amphibolite, and gneiss).

Xam: Metavolcanic Rocks

Black, dark-greenish, to gray-green amphibolite, and light gray to tannish well foliated and lineated gneiss.

The most abundant lithologies are biotite-amphibole schist, amphibole-feldspar schist and gneiss, and massive amphibole-epidote gneiss. These rocks are fine to medium grained, well foliated, and usually have a well-developed mineral alignment-lineation in the foliation plane. One amphibolite shows a well-developed lineation, but no foliation.

The amphibolite commonly contains thick layers to small pods of silicic metavolcanic rock, and metacarbonate and metachert that appear to be of exhalative origin. The silicic metavolcanic rocks are very fine grained, well-foliated and lineated gneisses. Thin layers of this lithology can be found within the amphibolite throughout its extent. Good exposures of this lithology are in sections 11, 14, and 15, T7N, R3W, in the Red Picacho quadrangle, where they form east-west-trending bands through the amphibolite.

Xmch: Metacherts

Red, purplish-brown, and black quartzite. These rocks are interpreted as cherts whose grain-size has coarsened through metamorphism. They occur as

pods and stringers interlayered with amphibolite and small bodies of carbonate breccia. Quartzites are common in sections 14 and 15, T7N, R3W, in the Red Picacho quadrangle.

Xmc: Metacarbonate

Dark-greenish-brown carbonate. These rocks occur as small bodies of carbonate breccia, commonly with siliceous stringers concentrated around their margins. These rocks occur together with metachert, and both rock types probably originated as exhalites.

Xms: Metasedimentary Rocks

Gray to reddish-gray schist, white, tan, and gray stretched-pebble conglomerate, and light-gray to medium-gray banded paragneiss.

The most common rock type in this unit is muscovite schist that varies in mineralogy from muscovite-garnet-biotite-quartz-feldspar, muscovite-andalusite-biotite-chloritoid(?)-quartz-feldspar, muscovite-cordierite(?)-biotite-quartz-feldspar, and muscovite-quartz-feldspar. These lithologies are fine to coarse grained, and well foliated and lineated. A local crenulation is unique to these metamorphic rocks in the study area. A striking variant to the muscovite schist assemblage contains andalusite porphyroblasts up to 10 cm long.

The stretched-pebble conglomerate contains clasts of felsic igneous rocks, probably volcanic lithologies. The matrix is composed of fine-grained muscovite, chlorite(?), quartz, and feldspar.

The paragneiss in this unit may be a transitional unit between the metasedimentary and the metavolcanic packages; it is certainly transitional in mineralogy, although it usually crops out in association with the metasedimentary rocks. The gneiss is composed of fine-grained amphibole, quartz, feldspar, muscovite, and pyrite. It is well foliated and moderately to well lineated.

Xps: Psammitic Schist

These rocks are derived from a lithic sandstone, are similar to the metaconglomerate, but lack the igneous rock clasts, and usually crop out near the metaconglomerate.

The fabrics developed in this unit include a well-developed foliation and a mineral and stretching lineation in the foliation plane. Pebbles in the metaconglomerate are flattened into the foliation plane and highly elongated in the lineation direction. Pebbles presently range from 1 to 20 cm in length, 1 to 3 cm in width, and 0.5 to 3 cm in height.

Xg: Granitic Rocks

Orangish-brown, tan, and gray- to light-gray, foliated biotite granite, light-gray to white biotite-muscovite granite. This unit includes several granitic lithologies, the most common of which is a fine-grained, foliated and lineated, biotite granite. This granite is commonly interlayered with metamorphic rocks on the scale of a few meters.

The next most abundant lithology is a medium-grained biotite-muscovite

granite. This lithology has a deformed border zone with amphibolite in sections 32 and 33, T8N, R3W in the Red Picacho quadrangle. It appears to grade into a porphyritic version with microcline phenocrysts (1-3 cm in length), aligned in the plane of foliation. This lithology rarely shows a lineation, and the foliation is commonly less well developed than in the orangish-brown-weathering biotite granite, or in the other Proterozoic rocks.

Medium- to coarse-grained equigranular to porphyritic biotite or biotite-muscovite granites outcrop in the northeastern corner of the Wickenburg quadrangle and the northwestern corner of the Red Picacho quadrangle. Foliation in these rocks is generally not well developed, and is confined to higher strain zones, with undeformed granite and related pegmatite between these zones. Undeformed portions of these granites can closely resemble the Cretaceous granite. The Proterozoic granites tend to be more resistant, forming large hills and ridges. They are also interlayered with sparse amphibolite and schist stringers, and are more variable in both grain size and mineralogy.

Xal: Leucogranite, pegmatite, and interlayered schist and amphibolite

White to gray, fine-grained, weakly foliated leucogranite and pegmatite. This lithology differs from other granitic rocks in the area in its almost complete lack of mafic minerals. Good exposures occur along the Castle Hot Springs road northeast of Trilby Wash.

Xp: Pegmatite

White, pink, and gray pegmatite. The mineral assemblage normally includes very coarse-grained microcline, quartz, muscovite, and tourmaline. Tourmaline commonly pervades rocks adjacent to the dikes, especially amphibolites and schists.

Pegmatite bodies intruded all Proterozoic units. The pegmatites usually occur in elongate bodies parallel to foliation of the host rock, although some pegmatites also cross-cut foliation. Only a few of the pegmatite bodies show evidence of deformation.

Lithium-bearing pegmatites occur in both the Red Picacho and Wickenburg quadrangles. Lithium-bearing minerals documented from the White Picacho District, the largest group of lithium-bearing pegmatites in the area, include spodumene, lepidolite, lithiophilite, amblygonite, and, eucryptite. Other minerals of interest include beryl, tourmaline, scheelite, columbite-tantalite and garnet (Jahns, 1952; London and Burt, 1978). K-Ar dates (Laughlin, 1969) on pegmatite minerals from the area yielded apparent ages ranging from 750-1580 Ma, with muscovite giving a minimum age of 1270 Ma.

Proterozoic Structures

Proterozoic rocks of the area contain large- and small-scale structures of known or suspected Proterozoic age that include interfolial rootless fold noses with axes parallel to the mineral-alignment lineation in the rocks. The presence of an isoclinal folding event implies that folding may pervade the Proterozoic section, and some (or all) of the lenticular map patterns may in fact reflect isoclinal folds.

A tight fold nose crops out in sections 5 and 6, T7N, R3W of the Red Picacho quadrangle. The axial plane of this fold is subvertical and strikes east-west, the axis dips about 60 degrees west, and the fold closes westward. This structure folds pre-existing foliation, but is not associated with an axial-planar cleavage or crenulation. Just northeast of this fold, in sections 32 and 33 of T8N, R3W, a broad, very open fold gently the foliation in and around the border zone of granite and amphibolite. The axis of this open-fold plunges steeply northwest, with the fold closing southeast. Another such open fold that crops out just to the west, has a nearly vertical axis and closes to the northwest.

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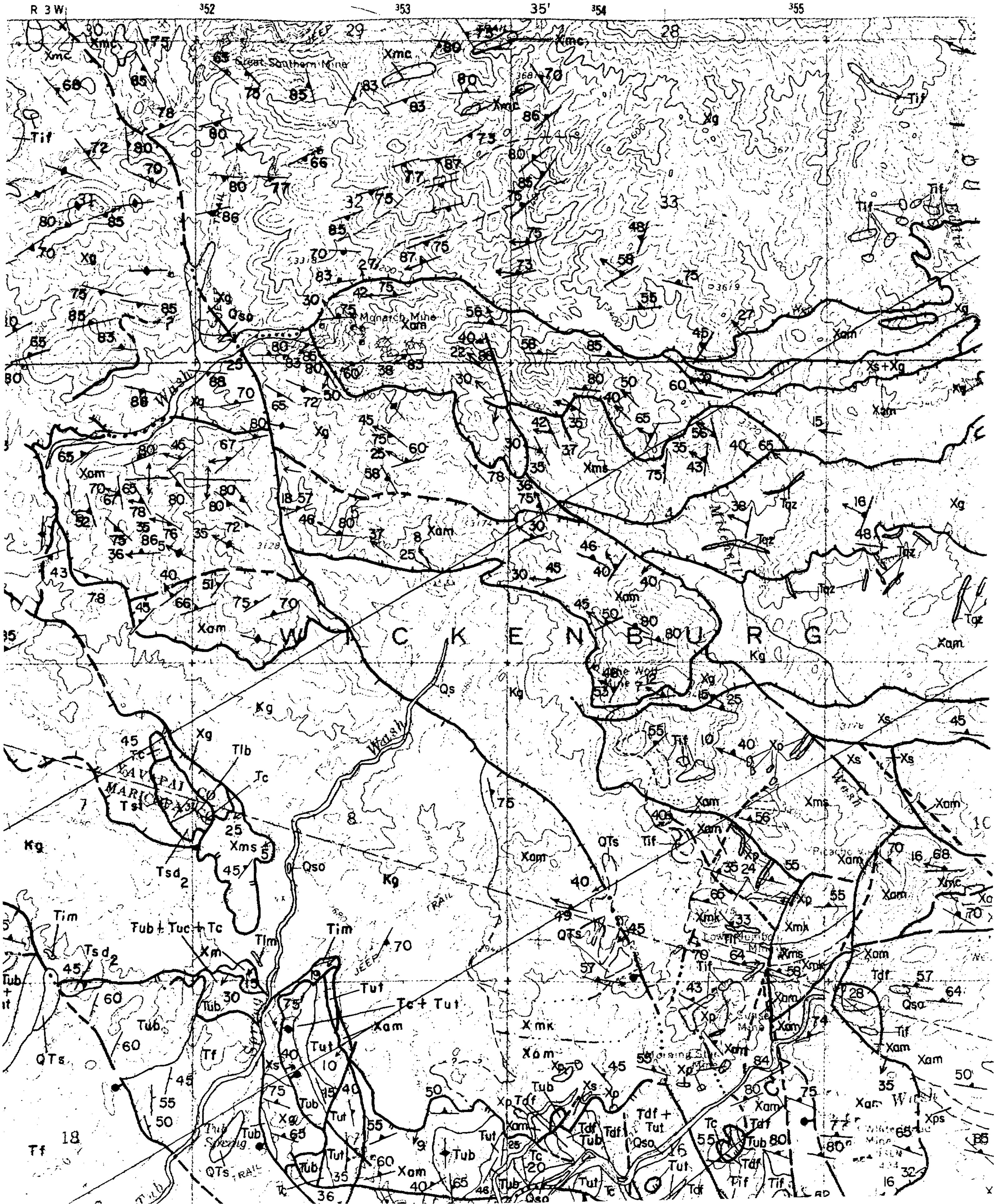

	I
A	170'
B	300'
C	2200
D	100
E	70
F	350
G	230
H	130

	Assay#	T.D
Hole A.	170 feet	
B	300 feet 50-135 Rotary; 810-1020 Core	
C	~~135~~ feet deep	2250?
D	175 feet	
E	60 feet	
F		
G		
H		

JDS

ASARCO

Southwestern Exploration Division

October 8, 1991

FILE NOTE

Monarch Mine
Sec. 32, T8N, R3W
Black Rock District
Yavapai County, AZ

Dr. E. Henry Valentine, Jr. of Miami, Florida, controls 7 patented and 117 unpatented mining claims surrounding the Monarch Mine in Section 32, T8N, R3W and extending into Section 5, T7N, R3W, east of Wickenburg, AZ.

Dr. Valentine has drilled 8 holes on his property, including a core hole to the depth of 2200 feet.

Figure 1 is the geology map from the Arizona Geological Survey, Open-File Report 87-9 on the Wickenburg, et al, mountains. The figure shows the Monarch Mine to be in a flat-fault sliver of metavolcanic rock (Xam) interlayered in granitic rocks (Xg), all of which are in detached plates moving to the southwest.

Three samples were collected in an unmapped sliver of quartz breccia within silicified tuff and diorite/andesite sill, which cuts the top of the Monarch hills and forms the western dip slopes in the Monarch mine area. This quartz breccia zone is five to ten feet in thickness and has numerous pits and shafts in it. Vertical quartz veins and stockwork are also found in the immediate footwall of the quartz breccia in several places.

The quartz breccia sill appears to terminate and merge with the low-angled structure mapped in the main drainages to the southwest.

Table 2 lists the values of the three samples. Sample M-3, running 0.077 opt gold and 0.98% copper was collected from an ore pile platform above the main shaft. It is unknown whether the stockpile came from the shaft workings or from a small open cut just uphill from the stockpile.

Dr. Valentine has drilled eight holes for back-to-back assessment work over the past years. Figure 2 is from Dr. Valentine and shows the approximate location of the holes. Table 3 lists the holes and their depths.

Hole C was rotaried down to about 800 feet, then cored the remaining distance to 2200 feet T.D. No significant gold, silver, or copper was found by Skyline in the split core.

Valentine's hole A had interesting gold values reported by the Iron King assay office, averaging 0.034 from 80 to 170 feet. Hole B had two similar values, while hole C had one 0.020 opt value (120'-125'). Hole D had two values between 65-80 feet (also by Iron King assay office). Hole E did not report any values in the three footages assayed.

Holes F, G, & H, had not been split and in the select core I viewed, the pyrite content was sparsely disseminated, but mainly occurred along fractures in the meta-diorite.

Scattered reported gold in the area dictates that further investigation is to be made in the district where numerous diggings along structures are shown on the topographic coverage.

Also sent to the files are several reports on the property, including the geophysical report of 1972 which suggest a deep IP response. In talking with Wiederwilt, this response could be from a ±3% pyrite content.

James D. Sell

James D. Sell

JDS:mek
Attachments

cc: W.L. Kurtz

Figure 1.
Monarch Mine

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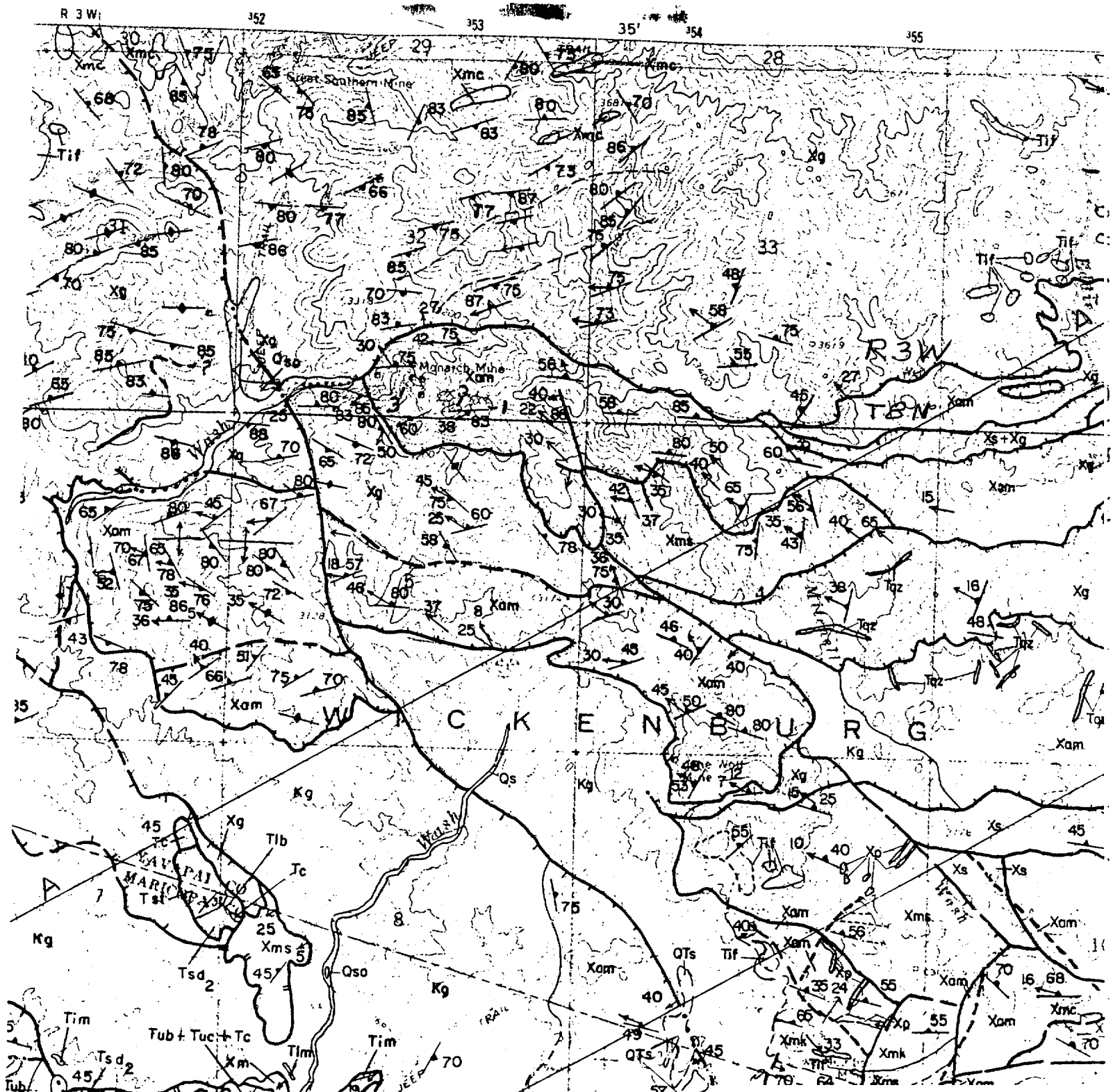

FIGURE 1.

Monarch Mine Area
Sec. 32, T8N, R3W
Red Rock 7½' Quad.
Yavapai County, AZ
AGS CFR 87-9

Figure 2

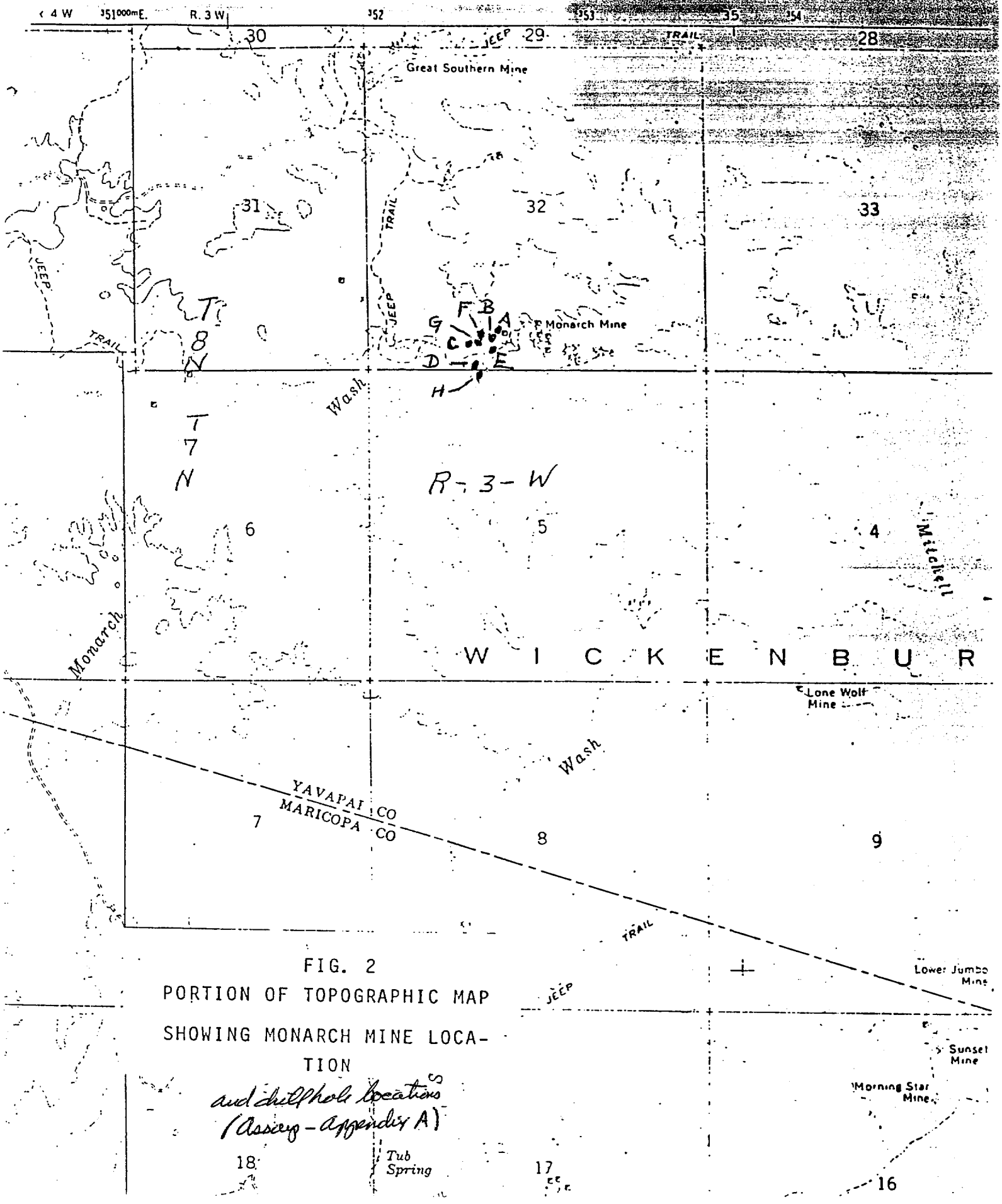

FIG. 2
PORTION OF TOPOGRAPHIC MAP
SHOWING MONARCH MINE LOCATION
and drillhole locations
(Assays - appendix A)

Table 1. M-Series Sample Descriptions and Values

Monarch Mine Sample/Assay 9/12/91
Sec. 32, T8N, R3W
Yavapai County, Arizona

M-1. SE¼, SE¼, SW¼, SE¼, Section 32. East end of easternmost cut. 6' cut of quartz breccia in volcanics/silicified tuff. Some copper stain and calcite addition with FeOx.
24 ppb gold; <0.5 ppb silver; 0.41% copper.

M-2. SW¼, SE¼, SW¼, SE¼, Section 32. Top working in series. 8' cut of quartz breccia in diorite/andesite sill, propylitic altered, with copper stain. Diorite sill caps all the hill tops and trends N-S with westerly dip (30°) down western side of hills to wash level.
12 ppb gold; <0.5 ppb silver; 0.20% copper.

M-3. NE¼, SE¼, SE¼, SW¼, Section 32. "Ore" pile from pit to SW of Monarch shaft (deep), above headframe foundation. Grab sample, 25', of quartz breccia with copper stain, some chalcopyrite, and FeOx.
2628 ppb (0.077 ounces per ton) gold; 1.2 ppb silver; 0.98% copper.

TABLE 2

ANALYSIS REPORT

ASARCO Lab

OCT 4 1991

SW Exploration

American Assay Laboratories

REPORT : SP 013930

Sample	Au ppb	Au(R) ppb	Ag ppm	Cu ppm
M-1	24	22	<0.5	4090 = 0.41%
M-2	12	16	<0.5	1950 = 0.20%
M-3	2628 = (0.077 opt)	2623	1.2	9760 = 0.98%

Please refer to the cover sheet for further analysis details.

Table 3. Monarch Drill Hole Numbers and Depths

Hole Number	Depth, feet
A	170
B	300
C	2200
D	100
E	70
F	350
G	230
H	130

Figure 1.
Monarch Mine

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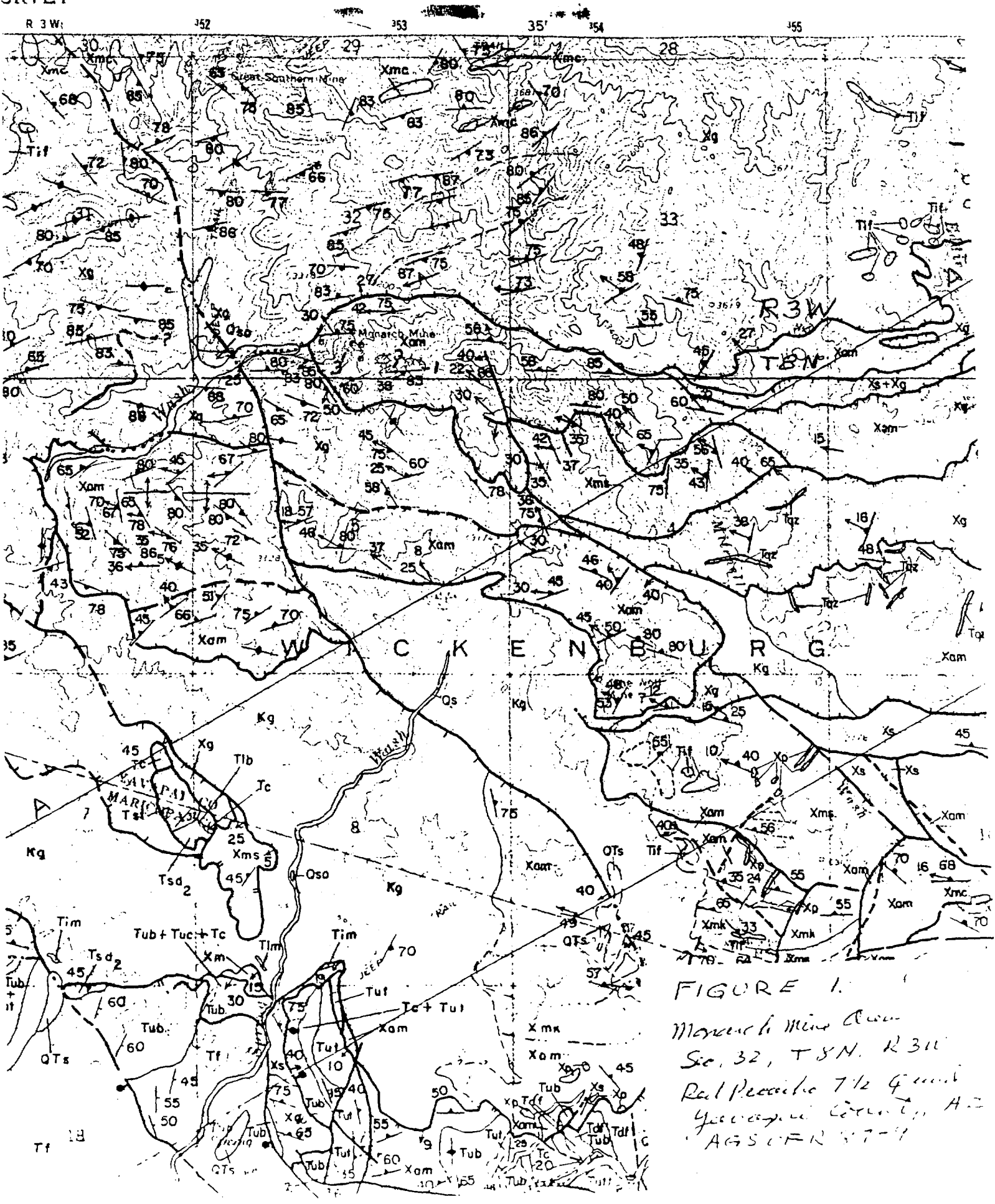

FIGURE 1.
Monarch Mine Area
Sec. 32, T8N, R3W
Red Peacock 7½ Quad
Yavapai County, AZ
AGS OFR 87-9

Table 1. M-Series Sample Descriptions and Values

Monarch Mine Sample/Assay 9/12/91
Sec. 32, T8N, R3W
Yavapai County, Arizona

M-1. SE¼, SE¼, SW¼, SE¼, Section 32. East end of easternmost cut. 6' cut of quartz breccia in volcanics/silicified tuff. Some copper stain and calcite addition with FeOx.
24 ppb gold; <0.5 ppb silver; 0.41% copper.

M-2. SW¼, SE¼, SW¼, SE¼, Section 32. Top working in series. 8' cut of quartz breccia in diorite/andesite sill, propylitic altered, with copper stain. Diorite sill caps all the hill tops and trends N-S with westerly dip (30°) down western side of hills to wash level.
12 ppb gold; <0.5 ppb silver; 0.20% copper.

M-3. NE¼, SE¼, SE¼, SW¼, Section 32. "Ore" pile from pit to SW of Monarch shaft (deep), above headframe foundation. Grab sample, 25', of quartz breccia with copper stain, some chalcopyrite, and FeOx.
2628 ppb (0.077 ounces per ton) gold; 1.2 ppb silver; 0.98% copper.

TABLE 2

ANALYSIS REPORT

ASARCO Inc.

OCT 4 1991

SW Exploration

American Assay Laboratories

REPORT : SP 013930

Sample	Au ppb	Au(R) ppb	Ag ppm	Cu ppm
M-1	24	22	<0.5	4090 = 0.41%
M-2	12	16	<0.5	1950 = 0.20%
M-3	2628 = (0.077 opt)	2623	1.2	9760 = 0.98%

Please refer to the cover sheet for further analysis details.