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COMMONWEALTH MINE

SUMMARY

The Commonwealth Mine in the Pearce Hill Mining District is a bulk Silver - Gold mining exploration target 25 miles south of Wilcox, Arizona. Control of the Pearce Hill Mining District was acquired by Platoro Mines, Inc. during March-April-May, 1975 and an initial program of data compilation, geological investigations, sampling, and metallurgical testing has been completed.

The results of the initial work has confirmed wide spread bulk silver-gold mineralization indicating several million tons of open-pitabile ore with values of \$15 - \$20 per ton at present metal prices and exploration potential for extentions of the known ore and possible new target areas.

Platoro Mines now has control of over 2,000 acres in the Pearce Hill District by option, claim staking and purchase. A program of drilling, further geological mapping, continued metallurgical testing, and economic feasibility studies is underway to be financed by the incorporation, stock issues, and options planned by the stockholders.

INTRODUCTION

The Commonwealth Mining property consists of eleven patented claims, two mill site claims, eighty-five unpatented claims, and twenty-four town lots owned by or under option to Platoro Mines, Inc., of Tucson, Arizona. The principal stockholders of Platoro Mines, Inc. are Lyall Lichty of Tubac, Arizona, Paul Eimon of Tucson, Arizona, L.A. Gaylen of Anderson, Missouri, William Brown and W.D. Cole of Tucson, Arizona. Information on the Commonwealth Mine has been compiled from old reports of the Commonwealth Mining and Milling Company, records of the Pearce Hill Mining Company, files from various mining companies, historical records, a graduate thesis by L.A. Smith, current graduate studies of Kim Howell, aerial photography contracted by Platoro Mines, Inc., and current geological mapping, sampling, and surveying by Platoro personnel. This report for Platoro Mines Inc., was compiled from the sources mentioned by Paul I. Eimon, Mining Geologist.

LOCATION

The Commonwealth Mine is located immediately east of the town of Pearce in the central part of the Sulfur Springs Valley in Cochise County, Arizona. Pearce is 50 miles North of Douglas, Arizona and 30 miles south of Willcox, Arizona. The Commonwealth Mine occupies the south half of the northeast quarter of Section 5, Township 18 South, Range 25 East, and is shown on the Pearce, Arizona, USGS 15' Topographic Quadrangle.

Pearce is one-half mile West of Highway 666 and is connected with Highway 666 by both a paved and a gravel road. Various dirt roads extend to the workings of the Commonwealth Mine which is 1500 feet southeast of the Old Store at Pearce.

The Town of Pearce now consists of a few houses, the Old Pearce Store, and a school. Railroad service to Pearce was discontinued in 1932.

Elevation ranges from 4400 feet to 4900 feet in the area controlled by Platoro Mines. Closest accommodations are at Sunsites, one mile north of the mine by paved road. Sunsites is a recent development with complete facilities and a population of approximately 850.

HISTORY

The Commonwealth Mine was discovered in 1895 by John Pearce. While driving some cattle over the Pearce Hill he picked up a rock and, noticing the unusual weight of the rock, he decided to have it assayed. It ran 2,100 ounces per ton in silver. He located six mining claims: the Ocean Wave, the Commonwealth, the One and All, the Silver Crown, the North Bell, and the Silver Wave. These claims comprise the heart of the district.

Pearce shipped a first car of rich float to the El Paso Smelter. This shipment ran 100 ounces in silver and one ounce in gold. The owners then sank No. 1 shaft to a depth of 50 feet in the west end of the outcrop, cutting the vein diagonally from the hanging wall into the footwall. The ore from this shaft was shipped and had about the same tenor as the first shipment.

In November, 1895, John Brockman of Silver City, New Mexico, optioned the property for the amount of \$275,000. In partnership with R.A.F. Penrose and a D.M. Barringer, both of Philadelphia, Brockman organized the Commonwealth mining and Milling Company.

The Commonwealth Company issued stock for the development of the mine. A portion of this stock was placed in England and Germany. Among the prominent stockholders were: Counts Bismark, Pourtales, and Tiele, of Germany; Professors Chamberlin and Salisbury, of the University of Chicago, and other prominent men. The first officers were: R.A.F. Penrose, Jr., President, D.M. Barringer, Secretary and Treasurer, and John Brockman, General Manager.

Brockman straightened No. 1 shaft to a sixty-degree angle and followed the vein downward to the water level, a distance of 267 feet. In the meantime, "A" shaft was begun at a point 150 feet west of No. 1 shaft and also sunk to the water level. The ore from the two shafts and that in between them was hoisted with a one-horse whim and shipped. After shipments were begun, the bond issue was retired within three months and a dividend of \$100,000 a month paid for a period of six months. This ore came from what is known as the Discovery Stope. While this ore was being mined, "B" shaft was started at a point 600 feet east of No. 1 shaft and penetrated the largest ore body yet found in the mine.

There being no branch railroad at this time all the ore had to be hauled to Cochise, and supplies returned, by wagons. The wagons were run in trains of four with a total capacity of 50 tons and each train was drawn by twenty horses.

In 1898 the first mill was built and put into operation. Pan-amalgamation netted an average extraction of 83 percent. The coarse crushing was done with Blake crushers and the fine crushing by German ball mills. The capacity of the mill was originally 30 tons a day, but this was soon increased to 200 tons by the addition of 60 thousand pound stamps. Rolls were added to the intermediate crushing department at the same time. The milling cost was \$2.00 a ton and the mining cost \$1.60 a ton, or a total cost of \$3.60 per ton.

This mill burned in June 1900, but construction of a new 80-stamp mill was immediately begun and put in operation in January, 1901. "C" shaft was sunk during the construction of the mill. It was located 100 feet in the footwall of the main vein and crosscuts were run and connected with it from all the main drifts. During the cutting of the station on the second level the Smith Vein was discovered at a point 80 feet in the footwall.

After the new mill was started, the method of mining was changed from stulls to square sets. The change was made necessary by the widening of the stopes to 60 feet and the mining of low-grade ores of the footwall zone of alteration. The period of high-grade milling had ended and a new period of low-grade milling began. The old mill heads averaged 18 ounces and the new were reduced to 10 ounces of silver a ton. This second mill operated on a 240-ton basis until 1905, or for a period of four years. At this time the big stopes became so heavy that it was necessary either to fill them with gob or to allow the hanging wall to close in. The latter course was pursued. The mine was shut down and ten days later 500,000 tons of waste came in.

The company then decided to grant a lease on the old tailings to D.T. Swatling, the mill superintendent, and A.Y. Smith, the mine superintendent. These men constructed a cyanide leaching plant with a capacity of 250 tons a day.

Tailings were leached for a period of about five years and 288,000 tons were handled. In 1906 the lease was extended into the mine and a portion of the mill was placed in operation. New cross-cuts were run into the caved area and 187,000 tons were mined and milled under the lease.

In 1910 the mine was purchased by the Montana Tonopah Mining and Milling Company. The officers who reorganized the company were: Charles E. Know, President, A.Y. Smith, Vice-President, F.L. Bryant; Secretary and Treasurer; and Edgar A. Collins, General Manager.

A new and modern mill was then erected at a cost of \$283,000. While the mill was under construction "D" shaft was sunk to the 8th level and all of the main drifts connected with the new shaft. The new mill was placed in operation in early 1913 and run until May, 1917, when it was found that the ore developed was too low grade for profitable handling, and operations were discontinued.

A total of 275,000 tons were mined and milled at a cost of \$4.20 a ton against an average value of \$5.22 a ton of ore mined.

In October, 1917, A.Y. Smith obtained a lease on the entire mine. This lease was still in operation in 1927 under the name of the Commonwealth Development Company. Under this lease 115,000 tons of ore at an average of 12.5 ounces in silver and 0.10 ounces of gold a ton were mined. The ore was shipped to the smelters at Douglas, under silica contracts.

Since 1927 the property was operated intermittently by lessors, most of the work in the upper levels because of the dangerous conditions at depth.

Recent attempts to promote the mine have centered on reworking the tailings and producing goldwater for medicinal purposes.

In March of 1975 two options were obtained by Platoro Mines, Inc., on the patented claims at Pearce and 24 Pearce town lots. At the same time eighty-five claims were staked on the surrounding ground by

Platoro Mines, Inc. Currently the surface and mine are being mapped, sampled, and studied for bulk mining potential by Platoro Mines, Inc.

TAILINGS

An estimated one million tons of tailings containing 2.5 to 3.0 ounces of silver is located immediately north of the mine workings. These tailings have been the subject of extensive metallurgical testing (unsuccessfully to date). Currently Platoro is making metallurgical tests in connection with tests on composite samples taken from current mine and surface sampling.

DEVELOPMENT

Approximately twenty miles of underground workings exist in the Commonwealth Mine. The workings cover the north and northeast part of Pearce Hill. A number of stopes have been worked to the surface, and an impressive glory hole several hundred feet long is found in the eastern part of the workings.

The underground workings consist of eight levels, spaced at irregular intervals. The main shafts were sunk on a 60° incline into the footwall of the vein system, and crosscuts were driven from them across the structural trend to allow access to the veins. Approximately two miles of workings on four levels are still accessible, and two of the main shafts are open. No head frames or hoists remain. The top of "C" shaft is covered by a small shed and the top of "D" shaft is timbered. The hoisting compartment at the "C" shaft has rails extending down the incline to the 7th level, and has been used by the current lessees to hoist equipment up the shaft. There are relatively good ladders in the manway extending from the surface to the seventh level. The eighth level may be reached by climbing down from the seventh level on a rope, but only the station on that level is accessible. "D" shaft, on the east side of Pearce Hill, is the largest of all the shafts, having three large compartments. The east end of the 5th level may be reached by "D" shaft from the 6th level, but the manway ladders are incomplete above the 5th level. The ladder in "D" shaft extending from the 6th level to the east end of the 7th level came loose and fell down the shaft during the early part of this study, leaving most of the 7th level inaccessible. One or two other shafts, especially the Brockman Shaft on the west side of the hill, have partial ladders.

Production records are incomplete, but Arizona Bureau of Mines records show total production of the mine through 1926 to have been 940,000 tons of ore with an average grade of \$11.71 a ton. The average cost of mining and milling was about \$4.20.

Production since 1926 has been intermittent but brings the total production over one million tons. Since the bulk of Commonwealth production was at the turn of the century when gold was \$20 per ounce

and silver approximately \$.60 per ounce the total value of gold and silver produced to date at 1975 prices would exceed one hundred million dollars.

Examination of available records and access to historical information indicates that low silver prices, excessive water, dangerous caving conditions, hoisting costs and erratic ore body trends contributed to the difficulties of the Mine after 1910.

A report in 1939 by a David Cole, Mining Engineer, El Paso, Texas showed 62,000 tons of ore reserves in the Commonwealth Mine valued at \$388,000.00 or \$6.25 per ton. (1939 prices)

Property

The property now controlled by option or staking by Platoro Mines includes all of the earlier workings, the area of the old tailings, part of the town of Pearce, and the prospects on the north side of Six Mile Hill. Total acreage controlled by Platoro is 1,864 acres including 199 acres of patented claims, 10 acres of mill site claims, approximately 1,650 acres of unpatented claims, and 5 to 6 acres in 22 town lots in Pearce. This is shown on the attached 1" = 500' property map.

GEOLOGY (See Kim Howell and T.B. Smith theses for more detail)

Exposed in the Pearce Hill and Six Mile Hill area are sediments of the Bisbee Group, a series of Tertiary volcanic flows including volcanic breccias, and Quaternary alluvium.

Bisbee Group

The oldest rocks in the Commonwealth Mine area are the sandstones and quartzites of the Bisbee group. There is a small outcrop of altered Bisbee formation in the vicinity of No. 9 shaft in the footwall of the North Vein but the principal exposures are in the adits entering the north side of Pearce Hill. The adit which provides access to the third level goes through over 500 feet of Bisbee before it is faulted against a volcanic unit.

Volcanic Flows

The volcanic series consists of a number of units and have been classified by Kim Howell in sequence (lowest to highest) as follows:

- (1) First Flow - Dark, (altered) aphanitic flow breccia
- (2) First Water-Lain Tuff - Volcanic-derived arenite
- (3) First Ash Flow - Rhyolite ash flow tuff
- (4) Second Water-Lain Tuff - Volcanic lithic to arkosic arenite
- (5) Second Flow - Arkosic arenite
- (6) Second Ash Flow - Partially-welded tuff
- (7) Third Flow - Andesite - Trachyte
- (8) Third Ash Flow - Vitrophyre tuff

Structure

The variable nature of the volcanic flows and the extensive faulting makes volcanic and sedimentary attitudes difficult to map. Strikes and dips mapped by Kim Howell are shown on the attached maps.

The most prominent structural feature of the district is the fault zone controlling the mineralization at the Commonwealth Mine. This is a series of fault and breccia zones striking from N 70° W to N 85° W and dipping 55° to 65° South - Southwest. This fault zone has been traced from a point approximately 700 feet South-southeast of the Old Store for more than one half mile along the strike of the zone across the north part of Pearce Hill branching and extending under alluvial cover on the central eastern part of Pearce Hill.

The Commonwealth Fault Zone or Vein System is 50 to 500 feet wide and consists of a branching group of faults. The most intense brecciation and faulting is along the hanging wall but distinct vein walls are difficult to define. The veins grade into zones of sheeting or stockworks on the foot hill side. The character of the veins is often related to the lithology. The Bisbee formation is the most incompetent of the rock units. Fractures in this unit are generally gouge zones with little open space. Veinlets and stringers in the Bisbee are much less abundant than in the other rock units, and the overall wallrock grade appears to be lower in silver and gold.

MINERALIZATION AND ALTERATION

Ore mineralization in the Commonwealth occurs in shoots in the wide fault zone, the highest grades generally occurring along the hanging wall. According to old reports the largest shoot produced over 500,000 tons of ore and was over 800 feet long and averaged 60 feet wide.

Mineralization has been classified as epithermal - native gold and silver minerals cerargyrite, embolite and minor native silver. In the lower levels Smith reported occurrences of proustite, tetrahedrite, chalcocopyrite, galena and traces of molybdenite. Vein material includes vuggy, amethystine and fine grained white quartz. The primary mineralized vein systems have been oxidized and transportation has caused enrichment creating the original near surface high grade ore bodies. Various interpretations for zonal enrichment have been proposed but insufficient data exists for definitive conclusions.

Alteration of the wall rock occurred out from the structures and is very intense in some areas. Strong silicification and propylitization are evident. Secondary calcite and sericite occur.

Megascopic minerals in the veins include quartz, iron oxides (hematite and limonite) siderite with some alunite, sericite, kaolin, calcite (manganiferous) and manganese iron oxides. Gold and silver minerals are, in order of importance: cerargyrite, embolite, free gold, argentite and native silver.

SAMPLE RESULTS

During March and April 1975, 648 chip-channel samples were taken from surface outcrops and from the underground workings by Platoro Mines, Inc., personnel. These were 10-20 pound samples taken over 5-12 foot widths where representative samples could be taken. These have been plotted on 1" = 50' scale surface and level plan maps which are attached to this report.

Approximately 35 spot samples were taken by Kim Howell during her underground mapping.

During the course of the Platoro examinations old level maps and sections were obtained and copied. These maps are on file in the Platoro offices.

Study of these results indicate: (1) higher grade mineralization in zones or shoots along the footwall, (2) other erratic moderate grade zones throughout the Commonwealth Vein System, (3) low grade background zones and (4) very low grade background zones within the entire system.

Extremely extensive systematic sampling will be necessary to adequately test the bulk precious metal potential of the Commonwealth. However, it appears that the above zones could average the following grades.

	<u>oz Au/ton</u>	<u>oz Ag/ton</u>
(1) Higher grade zones	.04	4 - 5
(2) Moderate grade zones	.03	2 - 3
(3) Low background zones	.02	1 - 2
(4) Very low background zones	.01	0 - 1

Mathematical averages of zones defined by this preliminary sampling are being calculated but there appears to be potential for 5 - 25 million tons of open pitable ore averaging .02 - .03 oz Au/ton and 2 - 4 oz Ag/ton with a 3 to 1 stripping ratio.

METALLURGICAL STUDIES

Preliminary metallurgical studies comprising thirty-six laboratory tests have been made to date on various composites of the Commonwealth property, namely -

<u>SAMPLE NO.</u>	<u>COMPOSITE REPRESENTING</u>	<u>ASSAY</u>	
		<u>Gold oz/T</u>	<u>Silver oz/T</u>
Platoro 1	Small tailings dump approx. 250,000 tons	.020	2.80
Platoro 2	Thirteen samples taken across main crosscut third level	.071	3.16
Platoro 3	Forty-one samples taken from surface evaluation samples	.027	3.23
Platoro 4	Thirty-five samples taken from third level evaluation samples	.032	1.82
Platoro 5	Thirty-six samples taken from fifth & sixth level evaluation samples	.028	2.48

Tailings Sample

Some twelve laboratory flotation and cyanidation tests were run on the tailings sample represented by Platoro 1. The results indicated that by re-grinding the tailings to 83% minus 200 mesh, a flotation recovery of 50% of the gold and only 25% of the silver in a concentrate containing 0.12 ozs. gold per ton and 17 ozs. silver per ton, could be obtained.

Cyanidation tests on the tailings sample indicated that by regrinding and agitation in strong cyanide solution, the gold extraction was over 50% but the silver extraction varied between 30 and 35%. The tests on the tailings sample were discontinued as soon as ore samples became available.

Ore Samples

Twenty-four laboratory tests have been run to date on the various ore sample composites. The methods used were mostly treatment to break up

various silver mineral complexes followed by two or three stage cyanidation. General results were as follows:

1. There is no difficulty in extracting over 90% of the gold by flotation or direct cyanidation of the ore.
2. No matter what technique is used, there remains about 1 oz. per ton of silver which is not extracted.
3. Flotation yields a high grade concentrate.
4. The following pre-treatment schemes before cyanidation all gave about the same content of silver in the residue.
 - (a). Sulfuric acid with ferrous sulfate and iron to reduce manganic compounds.
 - (b). Caustic soda and aluminum metal to break up sulfides and antimonides.
 - (c). Lead nitrate with caustic soda and aluminum, and lead nitrate in the cyanidation steps.
 - (d). Hydrochloric acid to break up jarosites.
 - (e). Grinding all minus 200 mesh in cyanide solution.
 - (f). Grinding all minus 325 mesh in cyanide solution.

Further work has been suspended until microscopic examination of representative ore samples and of the residues of several of the above tests, have been made. It will be our endeavour to determine in what form the silver that so far has resisted extraction, occurs.

SUMMARY OF COMMONWEALTH TEST RESULTS TO DATE

Test Method	Heads		Tails		% Extraction	
	Gold	Silver	Gold	Silver	Gold	Silver
	oz/T	oz/T	oz/T	oz/T		
1. Flotation	.073	3.58	tr	1.15	100.0	70.0
2. 24 Hour Cyanidation - Grind Moderate	.090	3.40	.005	1.25	94.4	63.2
3. Flotation	.078	3.71	.005	1.15	93.9	70.7
3A. 42 Hour Cyanidation of Float Tails	.005	1.15	tr	.95		
4. Treatment with Sulfuric Acid and Ferrous Sulfate followed by 24 hour cyanidation	.070	3.50	.005	1.00	93.0	71.4
5. Flotation with Finer Grind	.083	3.50	.001	1.10	98.9	71.4
6. Treatment with Sulfuric Acid and Ferrous Sulfate followed by 48 hour cyanidation	.060	3.85	.005	1.15	91.7	70.1
7. 48 Hour Cyanidation	.060	3.85	.002	.90	96.7	76.6
8. 48 Hour Cyanidation	.027	3.22	.002	1.75	92.6	45.6
9. 48 Hour Cyanidation, Finer Grind	.027	3.22	.002	1.25	92.6	61.2
10. 72 Hour Cyanidation, Still Finer Grind	.027	3.22	.002	1.10	92.6	65.8
11. 72 Hour Cyanidation	.032	1.82	.002	.95	93.8	47.8
12. 72 Hour Cyanidation with Lead Nitrate	.027	3.22	.002	1.20	92.6	62.7
13. 72 Hour Cyanidation with Lead Nitrate	.032	1.82	.002	.85	93.7	53.3
14. 72 Hour Cyanidation after AL and Caustic Treatment	.027	3.22	.002	1.20	92.6	62.7
15. 72 Hour Cyanidation after AL and Caustic Treatment	.032	1.82	.002	.85	93.7	53.3
16. 72 Hour Cyanidation after AL and Caustic Treatment with Lead Nitrate	.020	3.50	.002	1.25	90.0	64.3
17. 72 Hour Cyanidation after AL and Caustic Treatment with Lead Nitrate	.015	1.80	.001	.90	93.3	50.0
18. 72 Hour Cyanidation after AL and Caustic Treatment with Lead Nitrate	.025	2.45	.002	1.20	92.0	51.0
19. 72 Hour Cyanidation after HCl Treatment	.030	3.50	.002	1.25	93.3	64.3
20. 72 Hour Cyanidation after HCl Treatment	.025	1.70	.001	.90	96.0	47.1
21. 72 Hour Cyanidation after HCl Treatment	.025	2.00	.001	1.00	96.0	50.0
22. 48 Hour Cyanidation, Ground all Minus 200 Mesh	.027	3.22	.002	1.25	92.6	61.2
23. 48 Hour Cyanidation, Ground all Minus 325 Mesh	.023	2.41	.001	1.20	95.6	50.2

CONCLUSIONS

The Commonwealth Mine has exploration or development potential for:

- (1) 5-25 million tons of open-pitabile ore valued at \$10-\$18 ton at present Ag-Au prices in the known vein system.
- (2) Further tonnage on the Commonwealth Vein System if drilling expands ore body widths and depths.
- (3) Discovery of higher grade ore bodies on extension of the Commonwealth vein system.
- (4) Sulfides at depth on the Commonwealth vein system.
- (5) Discovery of other deposits in the district under alluvial or volcanic cover.

RECOMMENDATIONS

(1) The Commonwealth vein system should be drilled by a series of rotary and diamond drill holes to define grade and tonnage figures for open pitabile Au-Ag ore.

(2) Metallurgical tests should be made on ore composites to ascertain recoverability and milling costs.

(3) Exploration studies (Geology, Geophysics, Geochemistry) should continue to define further targets. Drilling of these targets should be part of an overall exploration program.

Specifics on such a program are being prepared by Platoro and will be available.

SUMMARY

After signing an initial option on properties at Pearce, Arizona in June, 1980, the Stephens Mineral Group has explored and compiled data on a 17,050-acre property surrounding the town of Pearce. The goal has been to find a silver - gold deposit similar to or larger than the Commonwealth Mine (one million tons production at 12.5 oz. Ag and .03 oz. Au) or extensions to the Commonwealth Mine.

Exploration during the past year has consisted of: aerial photography, geologic mapping, photogeology, geochemical and geophysical surveys, data compilation, four diamond drill holes (2,494 feet), and fourteen rotary drill holes (3,060 feet), totaling 5,554 feet of drilling. In addition to this, earlier drill data and geophysical information has been uncovered and made available to the Stephens Mineral Group. Combined with results of the above-described work and previous reports, an impressive body of data has been assembled.

The coordination and interpretation of this data has clarified the geology and mineralization patterns of the Pearce Mining District. The geology is detailed on the attached plan maps and sections and is described in the text of this report.

The geologic picture is one of volcanic blocks, lying above the Cretaceous Bisbee formation with complex post depositional faulting. Epithermal mineralization is related to strong structural features and is widespread over many square miles. Zoning of epithermal mineralization has been determined by fluid inclusion studies, geologic observations, and geochemical sampling.

Three exploration targets or target areas have emerged from this work. They are:

1. The Commonwealth Mine in which the Stephens Mineral Group has a crucial 11% ownership - has significant exploration-development potential. Our restudy of all drill data gives the Commonwealth Hill a possible open-pittable tonnage of 3 to 5 million tons of 2½ ounces or greater of silver and .03 ounces of gold per ton. When the majority owners are amenable to reasonable exploration-development terms, this should be further studied and explored.
2. Six Mile Hill. Mapping, sampling and geophysical surveys have shown Six Mile Hill to have strong epithermal mineralization intensifying at the north end of the hill. Three drill

holes confirmed this pattern of mineralization. These holes cut strong quartz (amethyst)- calcite mineralization to the north but did not have significant gold - silver values.

3. Other Buried Targets. The more complete geologic picture, improved structural knowledge, and geochemical indications reaffirm that other ore deposits - such as the Commonwealth - could lie under Quaternary alluvium or exposed volcanics in the Stephens-controlled blocks.

It is recommended that a series of reconnaissance rotary holes be drilled to search for another epithermal system on the Stephens' ground. Re-assaying of previous drilling should be continued and more detailed gravity, plus magnetic data, could be acquired and interpreted.

RECOMMENDATIONS

1. Rotary Drilling for Another Epithermal System.

A program of continued data study, geochemical sampling of shallow rotary holes, possible geophysical surveys, and 300 to 400-foot rotary holes should be planned and executed to test for silver - gold systems on the Stephens' Pearce Properties.

2. Renegotiation of Platoro Option.

An attempt should be made to renegotiate the Platoro option to give time to logically explore the entire Project area.

3. Evaluation and Exploration of Commonwealth Mine Hill.

If reasonable option terms can be obtained from Carl Thetford et al, a restudy of the potential of the Commonwealth Mine Hill is warranted.

INTRODUCTION

The Pearce Project area lies in the central western part of the Sulfur Springs Valley in Cochise County, Arizona. The ghost mining town of Pearce is 50 miles north of Douglas, Arizona and 30 miles south of Willcox, Arizona. The area is shown on the Pearce, Arizona, USGS topographic quadrangle.

Pearce is one-half mile west of Highway 666 and is connected with Highway 666 by both a paved and a gravel road. The town of Pearce now consists of a few houses, the old Pearce store, and a school.

Elevations range from 4400 feet to 4900 feet in the Pearce Project area. The closest accommodations are at Sunsites, one mile north of Pearce.

The Stephens Mineral Group initiated work in the Pearce area in mid-1980 after John Stephens signed an option with L. A. Galyen (June 20, 1980) covering Six Mile Hill and other acreage contiguous to the Commonwealth Mine. Since that time an exploration program has been carried out to expand the property holdings, map the area, perform geochemical surveys, complete an initial group of diamond and rotary drill holes, and locate old and develop and compile new information.

A storage building has been built on the property to preserve, and have available for study, the drill and other samples that have been acquired from the Pearce area in the last few years.

This report is produced to summarize all the results and data produced and/or compiled by the Stephens Mineral Group on the Pearce area. For a complete review, it is necessary to examine the back up file and work sheet information in the Heinrichs Tucson office and the sample and drill core material stored in Pearce, Arizona. The project and this report is a joint effort directed by Paul Eimon. Most of the geologic mapping, logging, and writing of the geologic and geochemical part of this report has been done by Art Ona of Lowell & Pillar. Grover Heinrichs has done all of the property work on the project and has authored the property portion of this report. Bill Brown has directed the rotary drilling program.

HISTORY - PEARCE MINING DISTRICT

- Pre-1895 Early prospecting on the north end of Six Mile Hill on quartz veining failed to find commercial Au-Ag values.
- 1895 Discovery of high grade float on Commonwealth Hill by John Pearce lead to development of the Pearce Mining District.
- 1895 - 1927 Productive period of the Commonwealth Mine. Early developers R. F. Penrose, D. F. Barringer, and John Brockman used profits to fund development of the Bingham Canyon Mine in Utah and the Broadmore Hotel in Colorado.
- 1927 - 1975 Dormant period with intermittent attempts to leach the tailings and mine the upper workings by lessees.
- 1975 - 1976 Examination and sampling of Commonwealth Mine by Platoro Mines with five (5) rotary holes drilled immediately southwest of Commonwealth workings.
- 1976 - 1977 Option and exploration of the Commonwealth Hill by Bethlehem Copper Corporation, including diamond drilling and rotary drilling.
- 1978 - 1979 Exploration of the Commonwealth Mine area by Western States Minerals with thirteen (13) rotary drill holes.
- 1980 - 1981 Acquisition of (1) rights on property surrounding the Commonwealth claims, (2) claims covering Six Mile Hill, and (3) Arizona State Mineral Leases covering several thousand acres surrounding the Commonwealth Mine by the Stephens Mineral Group. Mapping, sampling, and drilling are currently underway on this project.

PROPERTY

As of July 1, 1981, the Stephens Mineral Group controlled approximately 17,295 acres in the Pearce Mining District. Of these, 17,050 acres were 100% controlled and 245 acres are partially controlled.

The land controlled by the Stephens Mineral Group is divided into seven (7) categories. Each category is keyed to the property maps in this report at scales of one inch equals 500 feet and one inch equals 2000 feet. The seven categories are as follows:

I.

Patented Mining Claims, Galyen - Platoro
100% under option to purchase by Stephens Mineral Group
Arthur, Hornspoon, Silver Thread, Rainbow
65 Acres

II.

Patented Surface and Mineral Title
100% under option to purchase by Stephens Mineral Group
Galyen - Platoro lease option
680 Acres

III.

Unpatented Mining Claims
100% under option to purchase by Stephens Mineral Group
Galyen - Platoro lease option
Pan Claim Group: Pan 1 thru 7
Pan 16 thru 78
1010 Acres

IV.

Unpatented Mining Claims - Located and staked July, 1981
100% controlled by Stephens Mineral Group
Vi 1 thru Vi 15
220 Acres

In process of location:
Karen 1 thru 43
660 Acres

V.

Unpatented Mining Claims

100% under lease option by Stephens Mineral Group

San Ramon Group)
San Ignacio Group) Hernandez & Cartmell Brothers et al
Blue Jeep Group)

660 Acres

VI.

State Prospecting Permits

100% controlled by Stephens Mineral Group

Group 1 - Due date for renewal: August 13, 1981
12 Parcels - 5,603.5 Acres

Group 2 - Due date for renewal: August 20, 1981
11 Parcels - 4,165.83 Acres

Group 3 - Due date for renewal: September 3, 1981
11 Parcels - 3,935.86 Acres

Total: 13,705.19 Acres

As of July 1, 1981, the rotary drilling program has secured for renewal permits, 11 parcels, totaling 4,215.86 acres. These parcels are numbered as follows: 1, 2, 3, 4, 5, 6, 22, 24, 28, 29 and 30.

VII.

Patented and Unpatented Mining Claims

11% under option to purchase by Stephens Mineral Group

Thetford - Corgill Commonwealth Mine Area:

105 acres patented - less surface land to school district patented mining claims

140 acres unpatented

BACKGROUND DATA ON THE PEARCE MINING DISTRICT

As part of current investigations, previous reports, old drill core, sample cuttings, assay reports, maps, photos, remote sensing imagery, geochemical survey data, geophysical data, historic records and other data have been collected and assimilated. These are stored in the Heinrichs Tucson office and in a core - sample storage building being constructed in Pearce. These represent years of work and large expenditures, and should be maintained for continued exploration. They are of considerable value.

This report summarizes results of current work and a restudy of the older reports. For further information the reader is referred to the data base in Tucson and Pearce. Principal reports include:

Smith, L. A., 1927, The Geology of the Commonwealth Mine: MS Thesis, University of Arizona, 73 pages.

Eimon, P. I., May 1975, Report on the Commonwealth Mine, 9 pages, unpublished report.

Eimon, P. I., December, 1975, Commonwealth Silver Project Report, 10 pages, unpublished report.

Jorgensen, N. B., 1976, Summer 1976 Program, Commonwealth Mine Property, Au Ag, Sulfur Springs Valley, Arizona: Unpublished report for Bethlehem Copper Corporation, 116 pages (Note: Maps and sections from this report are in Tucson and the text is being requested.).

Bryant, D. G., 1979, Post Mortem -- 1978-1979 Exploration of the Commonwealth Mine, Pearce Mining District, Cochise County, Arizona, 6 pages plus machine copies of maps and notes.

Drewes, H., 1980, Tectonic Map of Southeast Arizona, USGS Map 1-1109.

GEOLOGY - REGIONAL

Regionally the Pearce area consists of tertiary volcanic rocks resting on Cretaceous sediments. The volcanic rocks are mostly extrusive rhyolite and andesite occurring as hills in the Sulfur Springs Valley. The extrusives are lava flows, andesites, and tuff. The Cretaceous sediments consist of fine to coarse grain sandstone, often intercalated with thin silty beds. Attitudes of flow layers in the extrusives suggest a regional NW to NNW strike and moderate northeasterly dip ranging from 45° to 30° . The Cretaceous sediments exhibit variable attitudes although the strike is fairly consistent. The limestone at the northern slopes of Township Butte strikes NE and dips 45° to the SE. The sandstone/siltstone beds also on the slopes of Township Butte, show a northerly strike but dip gently (15° - 25°) to the SE. The same is true of sandstone/siltstone attitudes taken from prospect pits between Township Butte and Pearce Hill.

GEOLOGY - DETAIL

The Six Mile Hill and Pearce Hill area consists of a sequence of tertiary volcanic rocks resting unconformably on Cretaceous Bisbee sediments. The individual members appear to be thicker in this area than in the Township Butte area toward the east. The tertiary rocks are feldspar quartz rhyolite porphyry, quartz rhyolite porphyry, andesite, agglomeratic tuff, and hornblende andesite porphyry.

The feldspar quartz rhyolite porphyry is a dense, fresh, light gray rock, with feldspar (15 - 20%) and quartz (5 - 10%) phenocrysts: occasional thin quartz veinlets cut through the rock in general, except at the northern end of Six Mile Hill where thicker quartz-calcite veins are exposed. Alteration in this rock type is very limited. At best, the observed alteration consists of "clouding" of feldspar phenocrysts and restricted argillization on both sides of quartz-calcite veinlets. This rock appears to be a capping over some of the older volcanic rocks at Six Mile Hill and Pearce Hill.

Quartz rhyolite porphyry is light gray, fine grained volcanic rock, which contains 10% to 15% quartz phenocrysts. Quartz-calcite veins are very rare in this rock type. This rock is slightly to moderately argillized especially at Six Mile Hill where it crops out extensively. A thin vitrophyre zone 2 to 5 feet in thickness appears to be at the base of quartz rhyolite porphyry. A common characteristic of this rock is the spherulitic texture where concentric bands of quartz and radiating fibrous feldspar predominate. Occasionally, agglomeratic texture is exhibited.

The andesite appears to be a thin member (15 to 40 feet) of the volcanic sequence and occurs conformably on top of a rock unit described below as the agglomeratic tuff unit. The andesite is generally dark gray, occasionally light green and light brown. This unit outcrops at the center of the two northwesterly ridges at Six Mile Hill and can be traced for a strike length of approximately a mile. The texture is generally fine grained but occasionally a vesicular texture is exhibited. The rock is generally weakly prophyllitized.

Agglomeratic tuff is the thickest unit mapped in the area, probably more than 700 feet thick as observed in drill hole PP-1. The color is normally light gray but light brown and light pink are seen in drill hole core and in shaft dumps in the area. The texture is predominantly conglomeratic to sandy, with angular coarse fragments in a sandy matrix. Bedding is observed in the sandy portion. Surface attitudes show a strike generally NW and dipping 30° to 42° to the northeast. Dips in core appear to be in the same range. The fragments are mainly rhyolite, andesite, and quartz vein material. Rarely some fragments are carbonate rocks, wherein the cementing matrix is also slightly calcareous. Abundant quartz-calcite veins cut through this rock unit. A large portion of the silver mineralization in the Commonwealth Mine at Pearce Hill occurs in quartz-calcite veins in agglomeratic tuff. Alteration in this unit is predominantly argillic and silicified. This unit occurs at Six Mile Hill and at Pearce Hill apparently with younger rhyolite capping.

Hornblende andesite porphyry occurs as a unit below the agglomeratic tuff and appears to be the oldest of the tertiary volcanic rocks. Outcrops are found immediately south of Six Mile Hill and in two low hills $3/4$ mile SE from Commonwealth Mine. This unit is generally dark gray with abundant hornblende phenocrysts. This unit is normally unaltered except for the destruction of the hornblende to clay and limonite.

The Cretaceous sediments are predominantly coarse sandstone interbedded with thin layers of siltstone. Normally there is no visible alteration or mineralization except abundant calcite veinlets sometimes forming stockworks in the thicker siltstone. Iron staining is noticeable in limited sections where destruction of hematite, sulfides (?), and ferro-magnesian minerals has occurred.

MINERALIZATION AND ALTERATION

Argillic alteration is probably the only mappable alteration at a scale of 1"=500' in the Six Mile Hill and Pearce Hill area. A generalized alteration map is included in this report, based on megascopic examination of unmineralized (without quartz-calcite veins or veinlets) hand specimens. The most intense argillic alteration occurs in two main parallel zones at the Commonwealth Mine - Pearce Hill area, one of which roughly overlies the mined silver deposit at Commonwealth. The other parallel zone is elongated in a north-south direction, located approximately 2000 feet east of Commonwealth Mine.

Minor silicification is observed mainly in core samples in PP-1 and at areas immediately adjacent to quartz veins.

Limonite is commonly found in almost all of the rocks at the Pearce Project area. They are primarily the secondary products of the alteration and oxidation of ferro-magnesium-like hornblende and biotite. Possibly a few of the occurrences are related to minor sulfide mineralization.

DRILLING

Three diamond drill holes (PP-1, PP-2 and PP-3) were completed in the Pearce Project area, and one diamond drill hole (PP-4) is in progress. Enclosed in this report are the summary logs which are self explanatory. The drill holes intersected quartz-calcite vein systems which appear to be part of an epithermal system. Although the gold - silver mineralization intercepts are low in values, the accumulated data suggests targets northwest of Six Mile Hill along the regional northwesterly strike of the vein system. The drilling data also confirmed the stratigraphic sequence originally postulated from surface geology.

Twelve shallow rotary holes are programmed to satisfy state lease requirements. These programs are in areas around Six Mile Hill and Pearce Hill in the alluvium covered valley. The program is almost completed and data are presently being assembled and correlated. Initial results show some interesting silver and gold intercepts which suggests the possible existence of blind epithermal systems under shallow alluvial cover.

In the early 1960's to early 1970, other companies conducted rotary drilling programs around the Pearce Project area. Pillar, Lowell & Associates drilled fifteen (15) rotary holes around Pearce, Bear Creek

(Kennecott) drilled nine (9) holes to the east around the Turkey Creek Ridge area, and Occidental Minerals drilled two (2) to three (3) holes in Section 3, east of Commonwealth Mine (exact location uncertain, but local residents confirm drilling in the general area). All of these drill holes are probably related to porphyry copper exploration. Results of most of these drill holes are now available to us and are presently being correlated with other geologic information which was obtained during the later phase of the Pearce Project.

GEOCHEMISTRY

In mid-1980 a geochemical program was completed at Six Mile Hill. Samples were collected at 100 ft. intervals along lines 300 feet apart. Several elements were analyzed. The following are the general interpretations of results:

Silver:

Most of the values are below 0.5 PPM Ag; only one sample showed 2.0 PPM; no pattern is apparent.

Gold:

Most values below 0.02 PPM; few isolated spots showed 0.04 PPM Au; no pattern or trend observed.

Mercury:

Two zones containing 100 to 200 PPM, occurring north and southeastern end of Six Mile Hill, separated by areas with less than 100 PPM Hg.

Arsenic and Antimony:

A few isolated zones of greater than 50 PPM As and 10 PPM; most values less than 10 PPM As and 2 PPM Sb; a definite east-west zone at middle of Six Mile Hill containing greater than 20 PPM As and 5 PPM Sb.

Other Elements:

Other elements show no contrast that may be used to guide exploration.

In 1981, a random geochemical sampling program was carried out at the Pearce Project area. The program was designed to calibrate the distribution of mercury and 31 other elements in unmineralized rock. Samples were taken from outcrops and cover all rock types. The analysis was done by Skyline Laboratory, mercury by a geochemical method, and the 31-element scan by an emission spectrographic method. Only the results from Six Mile Hill and Pearce Hill are available at the present time. Maps of the different elements that showed sufficient contrast are part of this report. The result of this program is as follows:

Mercury:

Most of values at Six Mile Hill are in the 0.05 - 0.10 PPM Hg range. At Commonwealth (Pearce Hill) area, an anomalous zone of greater than 0.20 PPM occurs between Commonwealth Mine and Metat Hill. A narrow zone of greater than 0.20 PPM is also observed immediately south of Commonwealth Mine and north of our drill hole PP-3.

Silver:

Only a few silver values exceeding 5 PPM Ag are found at the Commonwealth area. It probably reflects the presence of the major silver-bearing quartz-calcite vein system.

Barium and Manganese:

An area between Commonwealth Mine and Metat Hill showed high barium concentration in the 2000 to 3000 PPM range, and high manganese values in the 500 to 800 PPM range.

Nickel:

An anomalous zone is also located between Commonwealth Mine and Metat Hill and showed values greater than 40 PPM Ni. Andesite rocks at Six Mile Hill exhibit higher Ni values ranging from 100 to 150 PPM Ni.

Vanadium:

An anomalous zone exists east of the Commonwealth Mine with values greater than 80 PPM Ni and a moderately high zone with Ni values in the 40 - 50 PPM vanadium is found at the northern end of Six Mile Hill.

Titanium:

Titanium values reflect the occurrence of an andesite flow at

Six Mile Hill. A broad zone of greater than 2000 PPM is found east of Pearce Hill.

Strontium and Copper:

Strontium and copper values reflect lithologic differences: higher in andesites and lower in rhyolites.

GEOPHYSICS

The Sulfur Springs Valley has been surveyed magnetically and gravimetrically by various organizations during the past twenty (20) years. Some of those surveys have been acquired and are in the Pearce Project files. More of this data is being sought. A 1" = 2000' magnetic overlay is included as part of this report.

The gravity surveys acquired to date have been spotty. Detailed surveys with elaborate computer processing do exist and reportedly show strong structural features.

VLF, IP and MaxMin surveys have been run in the Six Mile Hill area by Excel-Minerals crews. Results from these surveys have been inconclusive but further interpretation and recommendations are to be done.

The data presented in this report is to be reviewed by David Smith of the Stephens Mineral Group.

It is to be noted that, based on present Pearce Project Target Concepts, the prime exploration potential outside of the Commonwealth Mine is for a epithermal Ag - Au system under alluvial cover within 300 - 400 feet of the surface that is non magnetic, with limited electrical conductivity contrast or rock density contrast, that is related to strong faulting or fracture zones.

FLUID INCLUSION STUDY

A number of Pearce Mining District samples of quartz and calcite were collected by R. Robinson in August, 1980, for fluid inclusion analysis.

These samples were prepared for fluid inclusion analysis at the New Mexico Institute of Technology and analyzed in their laboratories.

The results of this work showed temperatures of homogenization in three groups. The lowest homogenization temperatures were found in the calcite temperatures from Six Mile Hill. These temperatures ranged from 132° C. to 177° C. with a mean of 150° C. The calcite appeared to be the last mineral deposited in the vein structures.

The next highest group of homogenization temperatures belonged to the quartz and amethyst samples from Six Mile Hill. These homogenization temperatures ranged from 150° C. to 236° C. with a mean of 183.2° C.

The highest temperature group of inclusions was found in the quartz from the Commonwealth Mine. These homogenization temperatures ranged from 171° C. to 266° C. with a mean of 220.5° C.

The salinities from the Commonwealth Mine seem to be in the lower range of values that have been reported for epithermal precious metal deposits.

Fluid inclusion data from the Pearce Mining District indicates that the vein material from north end of Six Mile Hill was deposited at a lower temperature than the veins in the Commonwealth Mine. Evidence of boiling is scattered throughout the samples from both Six Mile Hill and the Commonwealth Mine.

PHOTOGEOLOGY AND REMOTE SENSING INTERPRETATION

Photogeologic studies have been made of recent color aerial photography (1" = 500' scale), high altitude USGS aerial photos, and U-2 aerial photography. A photo linear interpretation and a blackline mosaic print of the Commonwealth Mine Hill and Six Mile Hill is included with this report. Work sheets of interpretation on other scales is in the Pearce Project files. This photointerpretation should be input into a continuing program of target selection.

A study has been made of circular and linear features on EROS Satellite Remote Sensing Imagery. The most striking features from this interpretation are a northeast trending linear crossing the Sulfur Springs Valley which passes through the town of Pearce, and a large circular anomaly in the area of the Sulfur Hills. These features are plotted on the 1" = 2000' scale composite geologic map in this report, and on overlays to the Imagery in the Pearce Project files.

EXPLORATION TARGETS

Geological mapping and interpretation; geochemical sampling and interpretation; and studies of drill hole cuttings and core, alteration patterns, mineralization values and zoning, geophysical data, photo interpretation patterns and regional structural studies give the following target areas for consideration:

1. The Commonwealth Mine Hill

The Commonwealth Mine Hill has been tested by mining, underground sampling by Platoro, rotary drilling by Platoro, diamond drilling and rotary drilling by Bethlehem Copper Corporation, rotary drilling by Western States Minerals Corporation, and one diamond drill hole by the Stephens Mineral Group. A restudy of all of this data gives the Commonwealth Hill a possible open-pittable tonnage of 3 to 5 million tons of 2½ ounces or greater of silver and .03 ounces of gold per ton. The commerciality of this area is dependent on Au - Ag prices, the willingness of the majority owner (Carl Thetford, et al) to agree to reasonable terms for development, and the results of further exploration and evaluation.

2. Six Mile Hill

Mapping, sampling, geophysical surveys and three diamond drill holes have shown Six Mile Hill to have strong epithermal mineralization intensifying at the north end of the hill. Two diamond drill holes were drilled at the north end of Six Mile Hill and one diamond drill hole was drilled in the center of Six Mile Hill. The holes at the north end cut strong quartz (and amethyst) - calcite mineralization with typical epithermal zoning, but did not have significant gold - silver values. This mineralization could be peripheral to a larger precious metal center.

3. Other Targets

a) Stephens Property Covered by Alluvium.

The bulk of the property controlled by the Stephens Mineral Group surrounds the Commonwealth Mine Hill and Six Mile Hill and is covered by relatively thin (50 to 200 feet) Quaternary alluvium. Evidence from data compiled

in this work and a study of the Epithermal Precious Metal Model indicates that other Ag - Au epithermal systems could be covered by this alluvium. Exploration for such centers would be by (1) continued data compilation and study, (2) acquisition of geophysical data showing possible mineralized structural features, and (3) reconnaissance drilling through the alluvial cover. This drilling could be very shallow (10 to 50 feet) to obtain geochemical samples or deeper (300 to 400 feet) to test bedrock.

b) Volcanic Hills in the Eastern Part of the Pearce Project Area.

A series of hills east of the Commonwealth Mine Hill show altered volcanics and some evidence of precious metal mineralization. These warrant detailed geologic mapping and further geochemical sampling. These include four main groups of hills:

Hill 1. The hill that centers between Sections 33 and 34, T.17S, R.25E, and is covered by the San Ignacio unpatented mining claims and currently under option to the Stephens Mineral Group.

Hill 2. The hill in the center of Section 35, T.17S, R.25E, and is covered by the Blue Jeep unpatented mining claims and currently under option by the Stephens Mineral Group.

Hill 3. Known as Township Butte in Section 1, T.18S, R.25E and Section 6, T.18S, R.26E, and is covered by three (3) patented mining claims and the San Manuel unpatented mining claims. The Section 6 portion is controlled by an Arizona State Prospecting Permit held by the Stephens Mineral Group.

Hill 4. Located in Section 36, T.17S, R.26E, and is controlled by an Arizona State Prospecting Permit held by the Stephens Mineral Group.

INTRODUCTION AND SUMMARY

This report, in conjunction with the July 8, 1981 report, is intended to summarize and update the Pearce Project through 1981, and to outline plans and proposed expenditures for 1982.

Past work was focused on geological and geochemical mapping of Six Mile Hill, Six Mile Hill South, the Commonwealth Mine, the Arizona State Parcels, and the Platoro-Galyen Parcel, as well as reconnaissance geology and geochemical mapping of the general area. Drilling was confined to Six Mile Hill, the Arizona State Parcels, and the Platoro-Galyen Area.

The results to date have moved our interest easterly to the San Ignacio Claims, the Blue Jeep Claims, the Township Butte Area, and the Township Butte North Area, and the proposed drilling program is outlined on Page 4 of this report. A sketch map of the location of the proposed drill holes is attached to this report.

The exploration program has been staged as follows:

- Phase I - Exploration, mapping and drilling, Six Mile Hill Area
- Phase II - Exploration, mapping and drilling, Arizona Prospecting Permit Parcels
- Phase III - Exploration, mapping and drilling, Platoro-Galyen Area and exploration and mapping of adjacent outcrop areas
- Phase IV - Proposed drilling and exploration program

The project is under the overall direction of Paul Eimon, assisted on land and administrative matters by E. Grover Heinrichs, with field geology being done by Arturo Ona, and William Brown being responsible for the drilling and sampling programs. Occasional geophysical assistance and advice was given to the project by Dave Smith of Salt Lake City, and William Daffron gave occasional geological advice and assistance to the project.

GEOLOGY AND GEOCHEMISTRY SUMMARY
AND RECOMMENDATIONS

I. San Ignacio Area

- A. Two vein systems have been identified.
- B. Two adits have been geologically mapped in detail.
- C. Detailed geological mapping was completed on the surface.
- D. A drilling program to test the vein system is being planned.
(See Pages 4 & 16.)
- E. Anomalous Hg, Ag and As areas have been recognized.

II. Blue Jeep Area

- A. Two northwesterly fracture systems have been identified.
- B. Two rotary drill holes have been programmed to test the two structures. (See Pages 4 & 17.)
- C. Trace element geochemistry showed slightly anomalous Hg values at the NW part of Blue Jeep.

III. Township Butte Area

- A. Detailed mapping has been completed.
- B. A wide zone of argillic alteration has been observed.
- C. Several Au-Ag anomalous zones have been recognized.
- D. Eight drill holes are planned to test the area. (See Pages 4 & 18.)

IV. Township Butte North

- A. Strong Au-Ag zones exist in the area.
- B. A prominent East-West structure has been recognized.
- C. Six drill holes are planned to test this area. (See Pages 4 & 19.)

In summary, the exploration work to date has identified a large epithermal system, and has narrowed the target area to three major vein systems in three separate areas that are very similar geologically and geochemically to the Commonwealth Mine (see map, Appendix E). They are:

- 1) San Ignacio Area
- 2) Township Butte Area
- 3) Township Butte North Area

The similarities of the three target areas to the Commonwealth Mine, and the comparison of trace element geochemistry to the ideal model epithermal system as defined in the paper by Berger and Eimon ("Comparative Models of Epithermal Silver-Gold Deposits", presented at the Commonwealth International, Inc. Epithermal Gold-Silver Field Seminar, Dec. 2-3-4, 1981) make these areas significant exploration target areas. The work outlined on Page 4 has been designed to test these vein systems.

The Blue Jeep Area, though of lesser interest, does show some anomalous mercury values and should be tested as outlined on Pages 4 & 17.

The details of the completed drilling program in the Platoro-Galyen Area and in Section 2, T18S, R25E, are described elsewhere in this report by W. G. Brown. Geologically, the results are summarized as follows:

- I. A slightly anomalous Ag dispersion train is observed in gravels in the NE portion of the Platoro-Galyen property.
- II. Bedrock shows very little geochemical activity.
- III. A pyritic zone in calcareous siltstones has been intersected at the NE portion of Section 2, T18S, R25E.

With reference to the Six Mile Hill South Area, geological mapping has been completed. The geochemical survey results have a very similar pattern to the results of Six Mile Hill. A minor vein system was identified, but significant anomalous values in arsenic only were detected (see Appendix E), and appear to be unrelated to the veining. No follow-up work is recommended at this time.

ESTIMATED EXPENDITURES

PROPOSED PHASE IV DRILLING PROGRAM

PERIOD: JANUARY, 1982 THRU APRIL, 1982

SAN IGNACIO (Sept.-Dec. 81 Budget)

Target Drill Holes:

7 Holes @250'; 2 Holes @300'; 1 Hole @150':

10 Holes = 2250' @\$12.00/Ft. \$ 27,000.00

BLUE JEEP (Sept.-Dec. 81 Budget)

Target Drill Holes:

3 Holes @250'/Hole = 750' @\$12.00/Ft. 9,000.00

TOWNSHIP BUTTE NORTH (Proposed)

Target Drill Holes:

7 Holes @150'/Hole = 1050' @\$12.00/Ft. 12,600.00

TOWNSHIP BUTTE (Proposed)

Target Drill Holes:

7 Holes @200'/Hole = 1400' @\$12.00/Ft. 16,800.00

TOTAL, 27 Holes - 5450'@\$12.00/Ft. \$ 65,400.00

ESTIMATED EXPENDITURES

PROPOSED EXPLORATION PROGRAM PHASE IV

PERIOD: JANUARY, 1982 THRU APRIL, 1982

Cost of Drilling:

27 Holes - 5450' @\$12.00/Ft.: \$ 65,400.00

Bulldozing, Support help, etc.: 2,000.00

Cost of Assaying (With Handling Costs):

Au & Ag - 600 Samples @\$10.00/Sample,
(10 ft. samples): 6,000.00

Hg, As, Sb - 110 Samples @\$12.60/Sample,
(50 ft. composites): 1,386.00

SUB TOTAL \$ 74,786.00

Management, reports, geologic mapping, drill
supervision, geochem sample acquisition, drafting: 32,000.00

Legal: 3,000.00

Property Payments: 14,666.67

TOTAL COST \$124,452.67

PEARCE PROJECT
FISCAL SUMMARY
TOTAL EXPENDITURES 1980 - 1981

	<u>1980</u> <u>Jun. thru Dec.</u>	<u>1981</u> <u>Jan. thru Dec.</u>	<u>Total</u> <u>To Date (Est.)</u>
Professional Services	\$ 15,070.00	\$ 75,990.00	\$ 91,060.00
Outside Services	2,266.87	57,668.96	59,935.83
Property Payments	159,294.68	48,969.00	208,263.68
Geophysics	-	4,708.01	4,708.01
Vehicle Charges	775.80	937.26	1,713.06
Drill Site Preparation	-	6,380.00	6,380.00
Drilling	541.98	189,615.71	190,157.69
Hotel/Motel Expenses	309.99	2,722.95	3,032.94
Meals	294.89	3,391.91	3,686.80
Freight & Postage	46.44	205.41	251.85
Maps & Copy Expense	433.00	1,619.61	2,052.61
Materials & Supplies	48.26	2,295.22	2,343.48
Telephone	418.53	664.53	1,083.06
Transportation - Veh. Rental & Air Fares	460.95	15,456.70	15,917.65
Assaying & Lab.	129.00	13,964.17	14,093.17
Aerial Photography	-	2,296.20	2,296.20
Rent	-	7,010.79	7,010.79
Misc.	-	<u>775.26</u>	<u>775.26</u>
TOTALS	\$180,090.39	\$434,671.69	\$614,762.08

Note: Some expenses are estimated. Some December, 1981, expenses not included.

ARIZONA STATE PROSPECTING PERMIT
EXPLORATION PROGRAM PHASE II

As part of the overall exploration effort for John A. Stephens in the Pearce, Arizona Area, a total of 34 Arizona Prospecting Permits were acquired in June and July of 1980 by E. Grover Heinrichs, acting as agent for Mr. Stephens. To hold these parcels, an expenditure of Ten Dollars (\$10.00) per acre is required on each parcel. The 34 parcels totaled 13,755.28 acres, and an expenditure of \$137,552.80 would be required if all parcels were to be retained.

Thus, an evaluation program was commenced to satisfy the State requirements and to acquire geologic data on a regional scale in order to "weed out" the unwanted parcels. Subsequent geologic and geochemical work eliminated nine (9) parcels and 4,137.21 acres from the program.

The State Prospecting Permit drilling program commenced on June 8, 1981, and was completed on June 28, 1981. A down hole rotary drilling method was utilized.

A total of 14 holes and 3,089 feet were drilled. Each hole was plugged and the collar cemented upon completion. A summary of each hole is included in this report. See Page 8. Samples were taken every 10 feet and taken to the lab for assay. The results are tabulated in App. J of this report. The holes were logged by Art Ona, and the geologic information gained by this drilling was made part of the overall data base included in this report. All drill holes are plotted on the Pearce Regional Geologic Map.

Direct drilling cost for this program was \$36,625.00.

ARIZONA STATE PROSPECTING PERMIT

DRILL HOLE SUMMARY PHASE II

- SL-24 Collared hole 6-8-81 in post-mineral fill. Lost circulation at 150' (made water at 240' - about 2 gallons per minute). Stopped hole at 470'; still in post-mineral fill on 6-8-81.
Bottom of hole is 470'.
- SL-22 Collared hole 6-9-81 in post-mineral fill. Encountered bedrock at 170' in med. grained sandstone. Continued in this unit to bottom of hole at 190'. Stopped hole 6-9-81.
Bottom of hole is 190'.
- SL-3 Collared hole 6-11-81 in post-mineral fill. Drilled in bedrock at 60' in a porphyritic rhyolite. 90-160' is an agglomerate tuff. 160' to bottom of hole is sandstone. Stopped hole 6-11-81.
Bottom of hole is 210'.
- SL-2 Collared hole 6-12-81 in post-mineral fill. Bedrock at 20' in porphyritic andesite. Changed to brown rhyolite at 70'. At 110' encountered an arkosic sandstone. No sample from 120' to 145'. Stopped hole 6-12-81.
Bottom of hole is 145'.
- SL-4 Collared hole 6-13-81 in post-mineral fill. Hit bedrock at 60' in conglomeratic tuff. Stayed in this unit to bottom of hole. Stopped hole at 190' on 6-13-81.
Bottom of hole is 190'.
- SL-5 Collared hole 6-13-81 in post-mineral fill. Did not encounter bedrock in hole. Stopped hole at 230' on 6-14-81, still in fill.
Bottom of hole is 230'.
- SL-1
(West) Collared hole 6-15-81 in post-mineral fill. Encountered bedrock at 100' in agglomerate tuff. Stopped hole at 150', still in tuff, on 6-15-81.
Bottom of hole is 150'.
- SL-6 Collared hole 6-16-81 in post-mineral fill. Fill is mostly clay. Stopped hole 6-16-81 in valley fill at 210'.
Bottom of hole is 210'.
- SL-1
(East) Collared hole 6-16-81 in post-mineral fill. At 80' encountered bedrock in dark, shaly limestone with pyrite. Stopped hole at 110' on 6-17-81.
Bottom of hole is 110'.

- SL-30 Collared hole 6-17-81 in post-mineral fill. No bedrock in hole. Stopped hole on 6-17-81 at 110'.
Bottom of hole is 110'.
- SL-2-A Collared hole 6-22-81 in post-mineral fill. Hit bedrock at 20' in porphyritic andesite. Encountered rhyolite at 70'. Lost hole at 100' on 6-22-81.
Bottom of hole is 100'.
- SL-29 Collared hole 6-23-81 in post-mineral fill. Stopped hole on 6-24-81, still in valley fill, at 400'.
Bottom of hole is 400'.
- V-6 Collared hole 6-25-81 in post-mineral fill. Ended hole at 200', still in valley fill. Stopped hole 6-25-81.
Bottom of hole is 200'.
- SL-28 Collared hole 6-26-81 in post-mineral fill. Very strong clay in hole. Stayed in valley fill to bottom of hole at 400'. Stopped hole 6-28-81.
Bottom of hole is 400'.

DRILLING SUMMARY - PHASE III

PLATORO - GALYEN AREA

E. Grover Heinrichs & Associates commenced a drilling program for John A. Stephens at Pearce, Arizona on November 10, 1981. The purpose of the program was as follows:

1. Gain sufficient additional geologic information on the Platoro-Galyen property in Section 4, T18S, R25E, to decide whether or not to meet a very large payment due on December 31, 1981.
2. To test geologic and geochemical projections on State land in Section 2 that permitted easy access.

The drilling was completed on November 23, 1981. A total of 3,265 feet and seventeen (17) drill holes were drilled on land in the east half of Section 2 and in Section 4, T18S, R25E.

Samples were taken every ten (10) feet and a split weighing approximately 12 lbs. was taken to the lab for assay, and an equal weight sample was tagged and stored at the Core Storage Building at Pearce, along with some random spot core that was taken as indicated in the drilling summary. All drill hole locations are plotted on the Pearce Regional Geologic Map included in this report.

Direct drilling cost for this program was \$37,968.75.

PLATORO-GALYEN AREA
DRILL HOLE SUMMARY PHASE III

- GH-1 Collared in post-mineral valley fill on 11/10/81. Lost air at 160'. No sample from 160' to 180'. Material is mostly clay with few rock chips. Bottomed hole at 275'. Still in valley fill. No core possible.
- GH-2 Collared in post-mineral valley fill on 11/11/81. Lost air at 160'. Went to sludge at that point. Material is mostly clay with few rock chips with a few sandy zones. Went thru the clay zone at 210' into a sandy zone with mostly rock chips. Bottomed hole at 275'. Still in valley fill. No core.
- GH-3 Collared hole in post-mineral fill on 11/12/81. Material is mostly clay with very few rock chips. Lost air at 140' in sandy-clay zone of 10'. 150' to 190' is clay with no rock. No sample 190' to 200'. Change at 200' to clay-sand. 210' to bottom of hole at 275' is normal valley fill. Mostly rock chips with sand. No core.
- GH-4 Collared hole in post-mineral fill on 11/13/81. All clay to 60'. Lost air and went to water at 100'. Valley fill with mostly rock and little clay and sand. Encountered bedrock at 150' - grey andesite with quartz veins and numerous quartz "eyes". Quartz and sericite are replacing sulfide casts. No mineralization present. Stopped hole at 210'. 200' to 210' encountered a poorly indurated sandstone (Kb?). Cored 1' to 211'.
- GH-5 Collared hole 11/16/81 in post-mineral fill. 0-20' is mostly clay. Went to water at 100'. Stopped hole at 200'. Still in valley fill. No core.
- GH-6 Collared hole in post-mineral fill on 11/16/81. 0-20' is mostly clay with some rock fragments. Gravel bed at 20-30'. Losing air. 20' to 150' is mostly rock fragments with sand. Stopped hole at 150'. No core. Still in valley fill.
- GH-7 Collared hole in post-mineral fill on 11/16/81. Clay 0-20'. Rock fragments with sand 20-60'. 70-150' is clay zone with some rock fragments. Quit hole at 150'. Still in valley fill. No core.
- GH-8 Collared hole in post-mineral fill on 11/16/81. Clay 0-20'. Rock fragments with clay and sand to 90'. 90' to 150' is clay zone with few rock fragments. Quit hole at 150'. In valley fill. No core.

- GH-9 Collared hole in post-mineral fill on 11/17/81. 0-20' is mostly clay. 20-60' is mostly rock fragments/sand and some clay. 60' to 140' is clay zone with minor rock fragment. Went to water at 130'. Quit hole at 150'. Still in valley fill. No core.
- GH-10 Collared hole in post-mineral fill on 11/12/81. 0-10' is mostly clay. 10-70' is rock fragments with sand and some clay. 70' to 120' is mainly clay with minor rock fragments. Encountered bedrock at 130'. Bedrock is white argillaceous tuff. No mineralization present. Minor quartz seams. No alteration is noted. Feldspars are fresh. No FE_2S . Quit hole at 200'. Still in white tuffaceous rock. 200 to 202' took core.
- GH-11 Collared hole in post-mineral fill on 11/18/81. 0-120' is gravel with sand and some clay. Lost air at 100'. Went to water. Hit bedrock at 130' in a gray hornblende andesite. Remained in this unit to bottom of hole at 200'. Unit is cut by calcite and quartz seams. No significant min. Took 1 ft. of core.
- GH-12 Collared hole 11/19/81 in post-mineral fill. Lost air at 60'. Went to water, at 110' went back to air. Hit bedrock at 110' in a fine grained tuff. Change in rock at 170' to a red, conglomeritic sandstone. Much FE_2 present and clay with calcite. No significant mineralization. Quit hole at 200'. Core 1'.
- GH-13 Collared hole 11/20/81 in post-mineral fill. Mostly clay to 30'. At 30' hit bedrock in a highly argillized andesite. Feldspars altered by chlorite-clay-calcite. Decreasing alteration with depth. Feldspars becoming fresher. Quit hole at 150'. Core 1'.
- GH-14 Collared hole in post-mineral fill on 11/20/81. Fill is mostly clay to 110' with small gravel interfingering. Bedrock at 110' in HAP. Small calcite veinlets appear. No quartz. Quit hole at 150'. 1' of core. No mineralization apparent.
- GH-15 Collared hole 11/23/81 in post-mineral fill. Hit bedrock at 30' in poorly indurated sandstone. Sandstone is cut by calcite veins with some quartz present. Rock change at 90' to shaly limestone. Limestone changed at 140' to darker, shaly unit. This unit is cut by numerous calcite veins. Quit hole at 150'. 1' of core. No Ag mineralization in hole apparent, but have numerous pyrite molds altered by calcite. Encountered water at 120'.

GH-16

Collared hole 11/23/81 in post-mineral fill. Hit bedrock at 20'. Light and dark sandstone with interfingers of shaly limestone. Sandstone contains calcite veins with some quartz. 60-70' is a rhyolitic rock. Quartz veining starts at 100' with increasing quartz-sulfides (pyrite) noted at 120'. Quartz is green, waxy with possible Ag mineralization. Strongest sulfide at 150'. Pyrite decreases starting at 170'. Also at 170' rock changes to dark, shaly limestone. At 200' a small finger of a diabasic rock intrudes the limestone. This rock contains strong sulfides. Quit hole at 230' in dark, shaly limestone/calcite veins and no quartz and weakening pyrite. Encountered water at 160'. 1' of core.

GH-17

Collared hole in post-mineral fill on 11/24/81. 0-20' is fill with possibly some Ag min. in quartz float. Bedrock at 20' in sandstone (arkosic)-Kb? Sandstone contains quartz veins with calcite cement. 60-70' quartz veins in sandstone are greenish. Has possible Ag min. No sulfides. Sandstone continues to 140' with quartz veining and no pyrite noted. 140' rock changes to black limestone with white calcite veining. Little quartz. No sulfides noted in the hole. Water at 120'. Quit hole at 150'.

Note:

All water encountered in Holes 15-16-17 is black, brackish and smells of sulfur.

mining
geophysical surveys | inc 

2400 EAST GRANT ROAD - TUCSON, ARIZONA 85719

TELEPHONE - 602 326-8619

November 24, 1981

Mr. David Smith
3589 MacIntosh Lane
Salt Lake City, UT 84121

Dear Dave:

Enclosed is a copy of the gravity map of the Pearce area. The data was reduced using elevations picked from topographic maps. The data quality looks very good.

The purpose of the survey is to determine the depth of Tertiary rhyolites and rhyodacites which contain precious metal mineralization. The difficulty in interpreting this depth from the data is that the volume of these rocks is small compared to other rocks that cause gravity anomalies.

The main gravity anomaly is a 20 mgal low on the southeast corner of the survey area. This anomaly is probably caused by a major alluvial basin that is down faulted on the east side. Minor faulting may also occur on the west side of the basin.

All of the drill hole information that we have indicates that the major density contrast occurs between the Cretaceous Bisbee formation and the Tertiary volcanics and alluvium. In all cases, gravity highs correlate with shallow Bisbee formation. Grover Heinrichs is going to provide us with more drill hole information to test this correlation in other areas, and if it holds up, the gravity data is showing the depth of Cretaceous and older rocks rather than the Tertiary volcanics.

There is a rough agreement between the Bouguer anomalies and the depth to bedrock map. Since bedrock is defined as Tertiary volcanics or Cretaceous Bisbee formation, whichever is intersected first by the drill, this agreement implies that the

Mr. David Smith
November 24, 1981
Page 2

depth to the Tertiary rhyolite and rhyodacite is controlled by the depth to the Bisbee formation. Therefore, the gravity data may provide an indirect indication of the depth of the Tertiary volcanics. The deep basin that extends to the southeast suggests that the depth to the Tertiary volcanics will continue to increase in this direction.

A detailed gravity survey with accurate elevation control will be required to directly detect the presence of the Tertiary volcanic rocks because of the small amplitude of their gravity effect. Grover estimates the thickness of the Tertiary volcanics at 300'. The maximum gravity anomaly from a 300' thick volcanic layer with a density contrast of 0.1 gm/cm^3 is only 0.4 mgal.

Grover is going to give us a suite of samples from the area to make density measurements on. This will help establish if a density contrast occurs between the Tertiary volcanics and other rocks. Another more direct test would be to run a detailed gravity profile where the depth of the volcanics changes and see if we can detect this change in the gravity data.

My present feeling is that the map we are sending you will probably be the major contribution of the gravity method to the exploration of this area. The complexity of the geology in the Pearce area make direct detection of the volcanics seem unlikely.

Regards,

Bob

Robert E. West
Geophysicist

Enc.

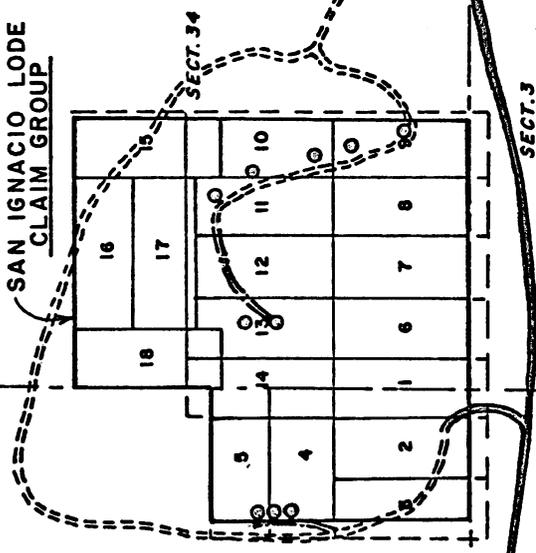
cc: Grover Heinrichs, Tucson ✓

MGS 1162

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geophysical surveys inc

COCHISE COUNTY, ARIZONA
R. 25 E.

SAN IGNACIO LODE
CLAIM GROUP



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T. 18 S.

SECT. 35

SECT. 2

SECT. 33

SECT. 4



DRILL HOLE LOCATION AND ACCESS PLAN

FOR
SAN IGNACIO CLAIM GROUP

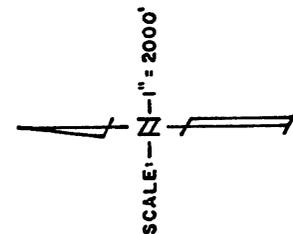
OF
PEARCE PROJECT
COCHISE COUNTY, ARIZONA

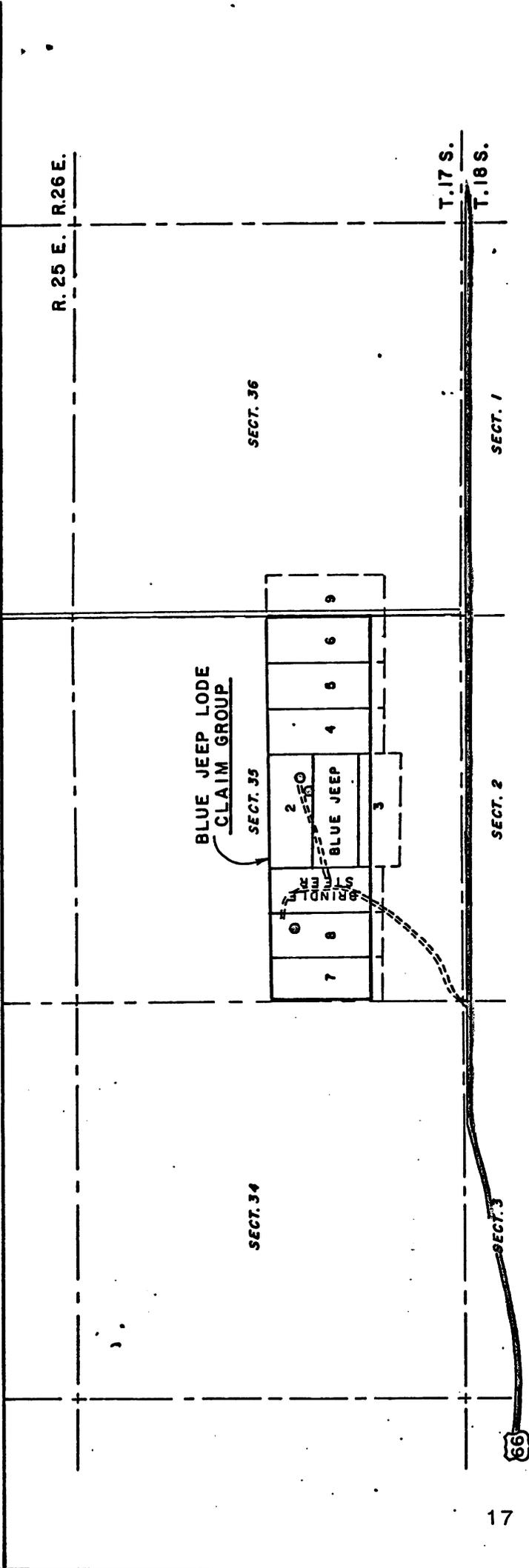
FOR
BY
MR. JOHN A. STEPHENS

E. GROVER HEINRICHS & ASSOCIATES
1802 W. GRANT RD., SUITE 110-4, TUCSON, AZ. 85705
DEC. 17, 1981

EXPLANATION

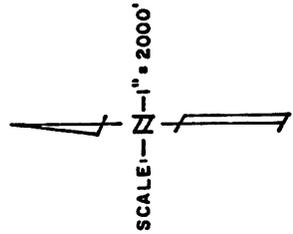
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EXPLANATION

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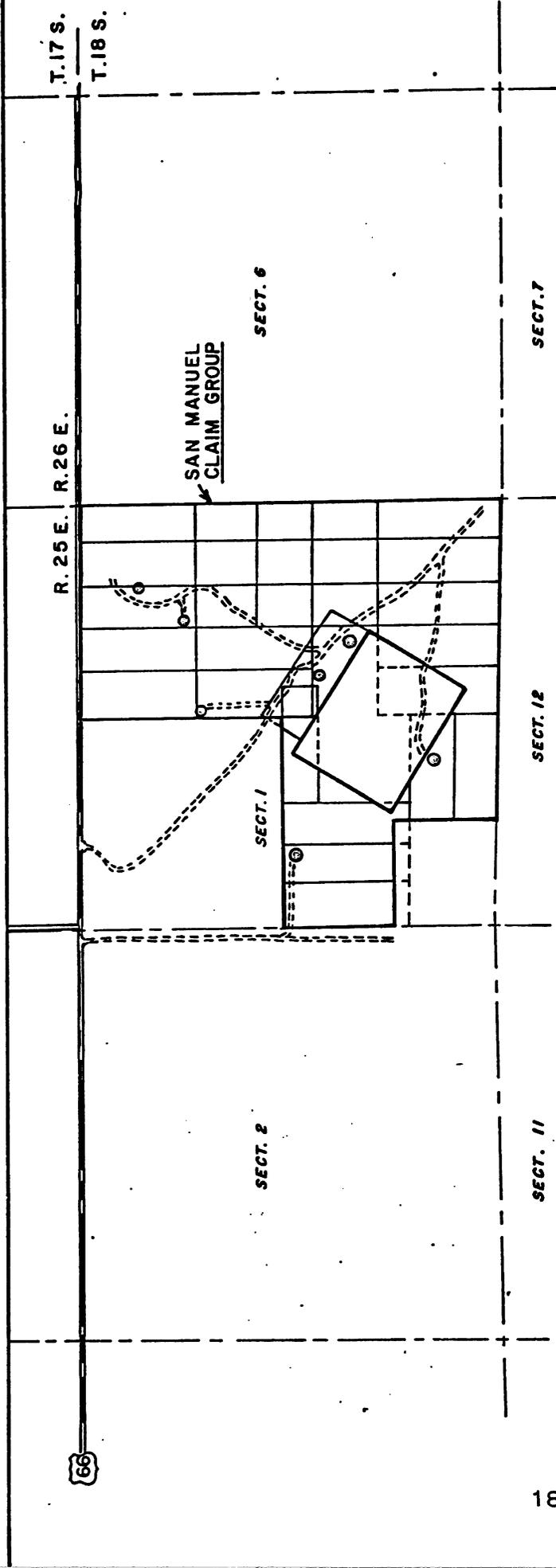
DRILL HOLE LOCATION AND ACCESS PLAN
FOR
BLUE JEEP CLAIM GROUP

OF
PEARCE PROJECT
COCHISE COUNTY, ARIZONA

FOR
MR. JOHN A. STEPHENS
BY

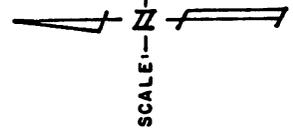
E. GROVER HEINRICH & ASSOCIATES
1802 W. GRANT RD., SUITE 110-4, TUCSON, AZ. 85705

DEC. 17, 1981



EXPLANATION

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DRILL HOLE LOCATION AND ACCESS PLAN

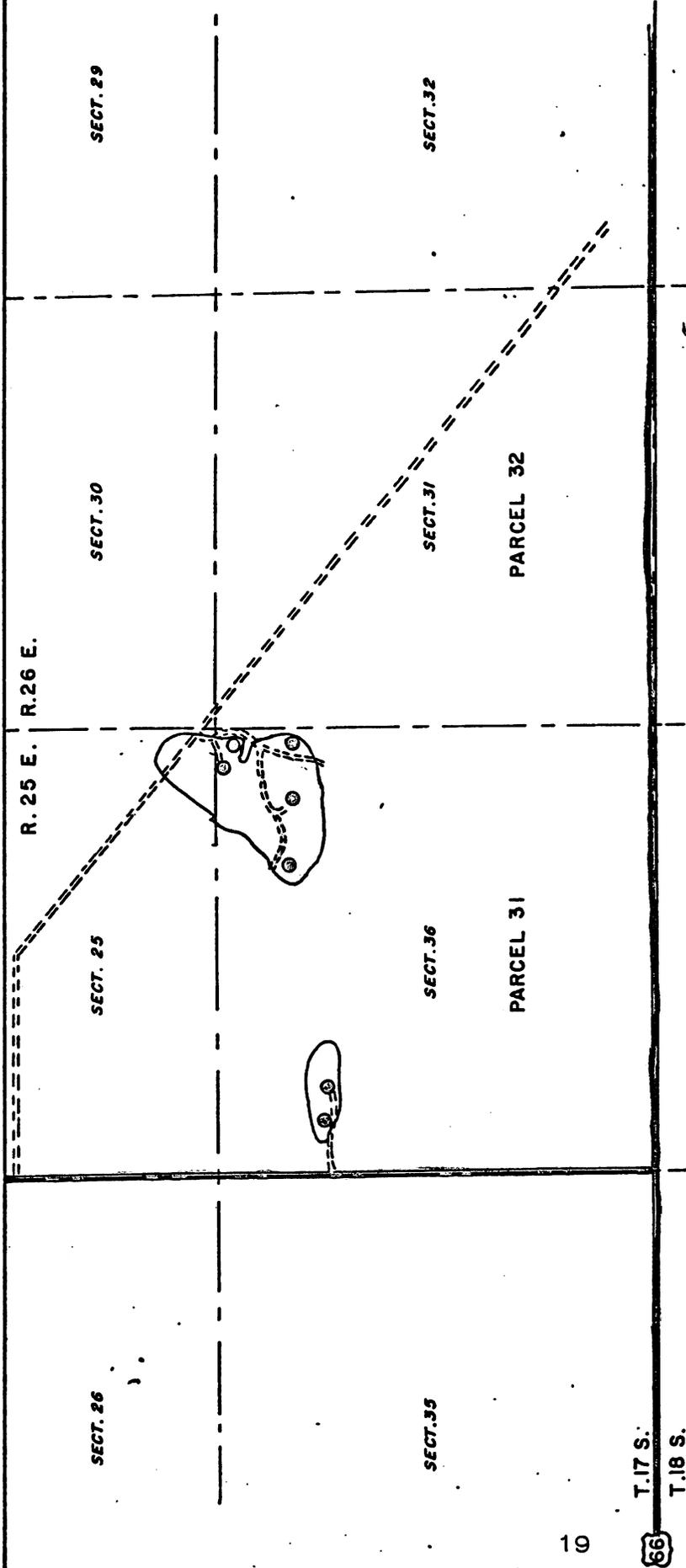
FOR
 TOWNSHIP BUTTE PROSPECT
 SAN MANUEL CLAIM GROUP

OF
 PEARCE PROJECT
 COCHISE COUNTY, ARIZONA

FOR
 MR. JOHN A. STEPHENS
 BY

E. GROVER HEINRICHS & ASSOCIATES
 1802 W. GRANT RD., SUITE 110-4, TUCSON, AZ. 85705

DEC. 17, 1981



DRILL HOLE LOCATION AND ACCESS PLAN

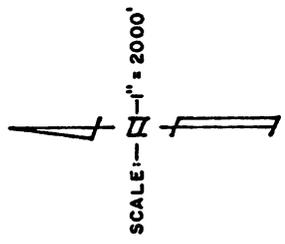
EXPLANATION

- INDICATES PROPOSED DRILL HOLE
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FOR
TOWNSHIP BUTTE NORTH
STATE LEASE PARCEL NO. 31, 32

OF
PEARCE PROJECT
COCHISE COUNTY, ARIZONA

FOR
MR. JOHN A. STEPHENS
BY



E. GROVER HEINRICHS & ASSOCIATES
1802 W. GRANT RD., SUITE 110-4, TUCSON, AZ. 85705

DEC. 17, 1981