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ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES AZMILS DATA

PRIMARY NAME: ARIZONA NATIONAL

ALTERNATE NAMES:
ANDERSON

YAVAPAI COUNTY MILS NUMBER: 991C

LOCATION: TOWNSHIP 13 N RANGE 1 E SECTION 20 QUARTER SE
LATITUDE: N 34DEG 29MIN 18SEC LONGITUDE: W 112DEG 16MIN 25SEC
TOPO MAP NAME: POLAND JUNCTION - 7.5 MIN

CURRENT STATUS: PAST PRODUCER

COMMODITY:
SILVER
LEAD
ZINC
GOLD

BIBLIOGRAPHY:

USGS POLAND JUNCTION QUAD
BLM MINING DISTRICT SHEET 19
YAVAPAI MAGAZINE MARCH 1918 P 4-6 SHARLOT
HALL MUSEUM PRESCOTT, AZ
LINDGRE, W. ORE DEPTS JEROME & BRADSHAW MTNS
QUADS USGS BULL 782 1926 P 129
ADMMR GEOL. FILE BIG BUG DIST. GENERAL FILE
ARIZONA MINING JOURNAL, JAN. 1918, P. 24
ADMMR AZ NATIONAL PROPERTY FILE
ANDERSON, C.A. AND S.C. CREASY GEOLOGY AND
ORE DEPTS OF THE JEROME AREA USGS P1 308
1958 P 171
ADMMR ARIZONA NATIONAL COLVO FILE
ADMMR PHOTOS A-9-30, 31

ARIZONA NATIONAL PROPERTY

REFERENCES

YAVAPAI COUNTY
BIG BUG DIST.
T13N R1E Sec. 20

Yavapai County MILS Index #991C

AKA: Anderson

USGS Bull. 782, p. 129

USGS PP 308, p. 171

Big Bug Dist. (geology file)

Arizona Mining Journal 1/15/22, p. 19

BLM Mining Dist. Sheet 19

Yavapai Magazine, March 1918, p. 4-6

AZ Mining Journal, January 1918, p. 24

MILS Sheet sequence number 0040250137

Poland Junction, AZ 7.5' Topo (included in file)

ARIZONA NATIONAL

Two miles west of Humboldt, Arizona.
Owner: V. Alexander, Box 142, Humboldt, Ariz;
Property now under option to Shattuck-Denn Mining Co.

Little or no recent production. Was last operated extensively in late 1920s. Then known as the Anderson Mine when it produced considerable good grade silver lead ore with some zinc. There is now little if any ore accessible and ready to mine.

This claim is situate on the southerly end of the Silver Belt vein on which the Shattuck-Denn Co are now conducting exploratory diamond drilling. Should the results of this drilling warrant they will no doubt rehabilitate and put the property into production.

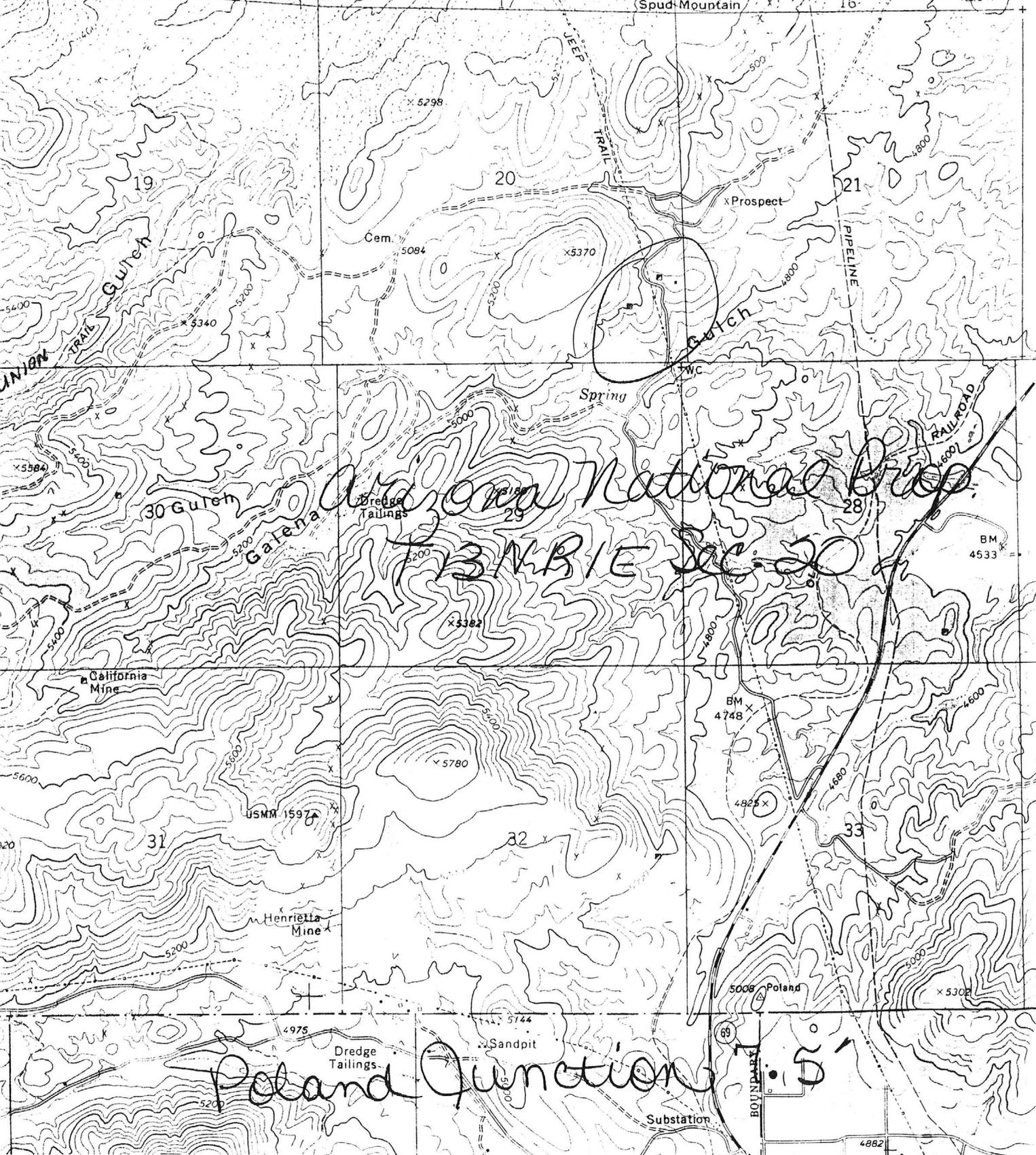
In the event that Shattuck-Denn should give up their option on this property, it would still have possibilities for the production, on a modest scale, of zinc-lead ores. To carry this out the owner would have to have financial assistance in the form of an exploratory loan.

October 25, 1950

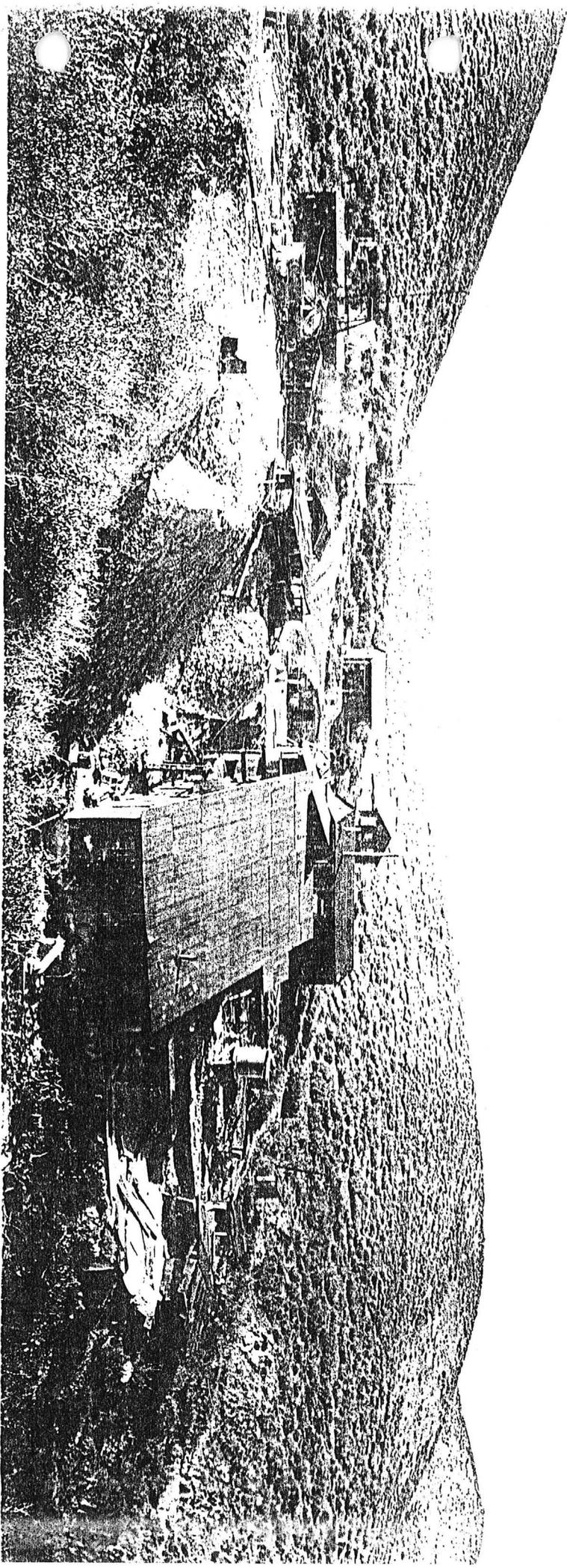

L. L. Farnham

POLAND JUNCTION QUADR
ARIZONA-YAVAPAI CO.
7.5 MINUTE SERIES (TOPOGR)
NE 4 MT. UNION 15' QUADRANGLE

380 381 17'30" 382 390 000 FEET 383 384



A-9-30 C-1931





ARIZONA NATIONAL PROPERTY
(Frank Anderson)

YAVAPAI COUNTY

Was advised that Verne Alexander is developing his (Alexander's) Arizona mine with 2 men working. TPL WR 5-26-62

Interview with Fred Schultze at Humboldt - 7-24-62

Mr. Schultze reported that the shaft had been cleaned out and repaired but at present no activity was evident. LAS

KP/WR 10/25/79 - A Mr. Gunnison is reported to be in charge of a secret processing operation at the Arizona National Mine, Big Bug Dist., Yav. Co. The operation includes hand shoveling small amounts of dump material onto conveyors treating the material with chemicals in a conical shaped hopper or tank and collecting concentrate in coca cola bottles.

REPORT ON THE

ARIZONA NATIONAL AND SILVER BULL MINE,

BIG BUG MINING DISTRICT,

YAVAPAI COUNTY,

ARIZONA,

By

Charles Edward Major,

Registered Mining Engineer.

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ARIZONA NATIONAL AND SILVER BELT LODES,

Big Bug Mining District,

Yavapai County,

Arizona.

PROPERTY AND LOCATION:

The property described in this report comprises two groups - the Arizona National, consisting of two full-sized lode claims, each 1500' x 600', a fractional claim and a millsite; and the Silver Belt, consisting of four full-sized lode claims, each 1500' x 600'. One full claim and the fraction, of the Arizona National, and two full claims of the Silver Belt are patented; the other claims are held under possessory rights by location.

Reference to the claim-map will disclose the relative positions of the several claims comprising the two groups and the valuable extent of the holdings along the main vein for a length of 2600'. Other claims, side-lining these principal claims, are held under location but have not been prospected to any extent and at this time are purely prospective and problematical as to value. The writer considers them of minor importance.

The combined groups lie on the lower easterly slope of the foot-hills and are reached from Hurboldt, about two and one-half miles distant, by a good auto road with easy grades.

Shipping facilities are excellent. The Bradshaw Mountain Branch of the Santa Fe Railway furnishes transportation and a loading siding is situated about one and one-half miles from the property to which shipments can be hauled by auto truck and loaded directly into the cars.

OPINION ON PROPERTIES:

From a personal examination, a knowledge of the geology of the country in which these properties are situated, and a previous examination of an adjoining property and the surrounding area, the writer has no hesitation in expressing his confidence in the merit of these properties and his belief in their ability to be made a highly productive enterprise if properly equipped and developed to permit of a large production and economical operation.

Important ore deposits are found in, or associated with, granite-perphyry and rhyolite intrusions. One, therefore, may not hesitate to say that the geological conditions found in these properties and in the surrounding section warrant the expression of an opinion favorable to their development and operation; and this

opinion may all the more confidently be expressed since the development of the Arizona National (and one may include the Silver Belt) so far carried on is an unquestionable demonstration.

Present development of the Arizona National was not carried on by the former owner with a view to future operations but seems to have been done on a hand-to-mouth plan, either because of a lack of knowledge of economical mining methods or because of the intent to mine only such ore as could be easily and readily opened up with a minimum of development, no development being carried ahead of production to properly open up the property and establish adequate ore reserves. And present equipment corresponds; it is entirely inadequate for the proper development of the mine and a material production of ore. The entire equipment of the mine seems to have been installed in a haphazard manner and to have been added to as necessity required, resulting in a multiplicity of units requiring expensive attention instead of having a compact and adequate plant ample for all requirements. It is these conditions which made possible the purchase of this mine. While they are not detrimental to the merits of the property itself, and can easily be overcome, they necessitate a considerable initial investment to enlarge, and in some instances to replace, present equipment, to

make such changes in the present underground development as will permit of economical production and to carry on development at depth ahead of ore production so as to establish and maintain ample ore reserves.

As the present condition of the workings of the Silver Belt preclude an underground examination, any expression of opinion as to the merits of this property must be based entirely upon a study of the geological conditions exposed at the surface, their correlation with what is disclosed underground in the adjoining Arizona National mine and in other properties where the same character of formation is found to exist, such data as may be known regarding underground conditions and ore deposition when the mine was in operation many years ago, and such data as are still extant regarding ore production and values in those early days. Summing all these up, the writer believes this property will prove a valuable producer when put in proper shape and further opened up by systematic development at depth.

HISTORY OF PROPERTIES:

It is not the purpose of this report to enter into a detailed review of the history of these properties further than to say they are not unproved prospects.

The Arizona National was first opened up as a prospect in 1914 or 1915 and began shipments of ore, so far as available records disclose, in 1915, since which

time it has been in continuous and profitable operation, though on a very moderate scale owing to its equipment and the method of development.

The Silver Belt is known as one of the "Oldtime" producers of Arizona, having been opened up and worked some forty or more years ago and operated under most adverse conditions but producing such rich ore that at the price for silver in those days it could be worked at a profit. It has lain idle since then practically continuously, though in 1918 work was undertaken for a short time but was soon abandoned because of bad management and direction. Such development as was made did not open up the mine to any considerable depth and its possibilities were not fully demonstrated.

GEOLOGY AND VEINS:

The country rock of this area in which these properties are located is the typical pre-Cambrian schist common to the greater part of Arizona. This is cut by dikes of diorite, granite-porphry and rhyolite, and probably some felsite-porphry, as fragments of the latter were found on the surface as "float" but their source was not located. Some distance west from these properties is an intrusive stock of quartz-diorite - an outlier from the extensive intrusion of this rock farther to the west.

Weathering, and the consequent alteration of these rocks, has brought about a heavy overburden covering the entire area, with the result that outcrops are limited in extent, where found, making it difficult to trace any particular formation on the surface. The schists have become chloritized and have decrepitated; the granite-porphyry dikes do not extensively outcrop and, where exposed, weathering discloses that they are greatly sheared and even schistose in structure; the rhyolites are sericitized and, where exposed on the surface, are schistose in structure, making it difficult to determine accurately whether they are an alteration of an original rhyolite or a sericitization of the schist; the basic dikes are generally broken down, in some instances being traceable only by fragments. It is evident that the basic dikes are the oldest of these intrusives.

Granite-porphyry and rhyolite are related rocks and the dike in which the main vein in these properties occurs seems to be made up of both of these - rather to be made up of both phases - as, to the southwest it is more granitic in texture while in the Arizona National and to the northeast it is more rhyolitic.

In this immediate area several other granite-porphyry dikes are found to outcrop, some forming matrices for veins the merits of which have never been investigated

by prospecting. Of these, two were investigated by the writer on another occasion at which time he was of the opinion that they would be found either to intersect the main vein or to form a junction with it at a point some little distance southwesterly from the present working shaft. When examining the Arizona National, that to the north of the shaft was found to have been disclosed by a crosscut driven northeasterly in the second level at a point some 75' or more southwesterly from the shaft, but the vein has not been prospected though its appearance seems to warrant some drifting on it to determine its possibilities. Nothing definite concerning the other was determined in the course of the writer's examination.

The veins occur as fissure filling and as a mineralization of the granite-porphyrty and rhyolite dikes. The main vein has a mean strike of about N. 26° E. and dips northwesterly at an angle of 76° to 85° from the horizontal, in both instances conforming to the plane of schistosity of the enclosing country rock.

Other veins parallel the main vein but nothing has ever been done to determine the possibilities of those exposed on the surface.

The gangue of the vein consists of quartz and calcite, with some rhodochrosite and manganese oxide, and probably some dolomite. Owing to the almost complete oxid-

ation of these rocks, the existence of the dolomite could not be positively determined, but from certain evidences, the writer is well satisfied that it will be found in lenses as a component of the vein, when less altered rock may be encountered underground. The entire dike might properly be considered to constitute the vein, as it is so extensively mineralized, containing small seams and stringers of ore across its entire width as well as containing persistent disseminations of pyrite, galena and other related sulphides, throughout.

The width between the walls is remarkably uniform, though naturally varying. The average width in the upper levels is 3.5' to 4', occasionally pinching down to one foot and less, but not for any long sections. In the fifth level recently opened up the width is found to be six feet and more, containing a large lens of rich sulphide ore and the rest being of a good milling grade.

The main vein has been traced, unbroken, in these properties by the writer for a distance of 7600', and to the southwest for an additional distance of 4500' and connected up with that known as the "McCabe" vein from which a large volume of rich ore has been profitably mined. Summing up these sections, we find that this vein has a continuous length of at least three miles and that it may be considered one of the important ore veins in this section.

911:

Extensive shearing, resulted in a fracturing of these dikes which facilitated the penetration of the mineral-bearing solutions and the consequent deposition of the ore in the veins, and the mineralization of the enclosing dike rock. The borders of the granite-porphry dike in which the main vein occurs consist of a sericitized schistose rock which may be an altered contact phase of the granite porphyry. As disclosed in the workings of the Arizona National, the contact of the dike with the enclosing country rock, is well defined by a gouge seam on either wall in which are frequently found rich silver sulphides in comminuted form. This gouge seam was also observed by the writer when examining an adjoining property, and was there found to be more noticeable where the mylonite texture of the dike rock predominated. This gouge is evidence of great movement and consequent grinding along the contact between the dike and the enclosing schist and supports the evidence of shearing found on the surface.

The main vein consists of seams and connected lenses of quartz and calcite carrying the ore which occurs in lenses, and in seams and disseminations through the gouge and the dike matrix. The ore is composed of sulphides of lead and zinc carrying rich values in silver, some pyrite, a small amount of gold and a little copper.

Some antimony was observed in the ore but not extensively. Aside from the solid lenses of high grade sulphide ore, the mineralization of the disseminated matrix is so extensive that it permits of the treatment of all rock broken as milling ore except in the few instances where the disseminated matrix has pinched up sufficiently to require the breaking of wall rock to properly carry a drift. This means economical mining with a low cost in handling waste.

As the sulphides are very friable, they enrich the milling ore to such an extent that the resulting concentrate contains about an equal value with the high grade crude milling ore.

While the high grade ore bodies are stated as occurring in lenses, the writer believes that deeper development will demonstrate that these lenses occur in shoots and that the downward extension of an ore body can be located with reasonable accuracy. All the work originally done extracted all rock as advance was made, making it impossible to determine from the present condition of the workings the extent of any particular ore body or the pitch of a shoot; consequently such new work as is now being done must be carried on in an exploratory manner until new ground may be opened up. This means money, but it will be money well spent.

Experience has shown that in arid countries oxidation of veins and rocks, and oxidation and leaching of ores,

extends to considerable depth; that surface showings are not to be considered as criteria but as indications, and that depth must be attained before profitable results can be realized. Veins do not get richer with depth, statements to the contrary notwithstanding; but the leaching of the mineral content of a vein diminishes as depth from the surface is attained and more ore will be found in situ in a given vein than was found nearer the surface. This condition has been demonstrated in the Arizona National; and the writer believes that the best part of this mine is to be found below the 500' level.

Strictly speaking, there is no positive ore exposed in the Arizona National mine at the present time. Owing to the method of previous operation by the former owner, work progressed as ore was exposed and mined, leaving all future development for actual production as needed. Present operators have had to carry development incidental with production because lacking the necessary capital for development purposes. The fifth level, opened up by them, is in ore but how large an ore-body may lie above this level must be determined by development work. Once development can be carried ahead of production and ore reserves established, as well as new ground opened up, the writer believes there will be no question about an ample ore supply for a long time to come. As concerns the ore

supply that may be expected from the Silver Bolt, this must await the opportunity for investigation after the workings are opened up and unwatched and an examination can be made. But it seems that the same conditions should be found in this property as are shown in the Arizona National, so far as probable ore is concerned, and that depth will prove an ample supply can be mined for many years to come, once the mine is properly developed.

PRODUCTION AND VALUES:

No attempt will be made in this report to state the values of the ore in these properties, production returns so much more completely showing what return may reasonably be expected. Besides, the report of Mr. F. Gibbs, E.I., is referred to for these data.

No complete data are available regarding the production from either party but such as have been obtained show that from the Arizona National there has been shipped in the term from November 1, 1915 to January 1, 1923, at least 3,563,040 pounds, dry weight, of ore and concentrate, having an average content of 99.57 ounces of silver and 27.343% of lead per ton. Reference to the list of these shipments shows that from the first to July, 1919, these shipments averaged, in the aggregate, 75 ounces silver and 25.563% lead, per ton, and from June, 1919, to January, 1923, they averaged 142.46 ounces silver and 30.52% lead,

per ton. The early shipments come from above the first level and probably partially from above the second level (about 160' below the surface), while the later shipments come from the second level steps north of the shaft and such ore as was mined below the second level up to the time the present operators began operations. Without a definite statement it is not possible to state in this report what proportion of these shipments was ore and what was concentrate because of their so nearly equal relative values. Subsequent shipments by the present operators are shown by the smelter certificates, to which reference may be made, which give the actual net return on production, exclusive of mining costs as follows:

DATE		DRY WT. TONS	Oz. Ag.	GROSS Pb.	NET % Pb.	NET SMELTER RETURNS
1922						
12/16	Flot	13.707	160.3	29.0-1.52	27.48	\$2205.37
12/16	Ore	.685	153.	52.0-1.5	50.5	133.79
1923						
1/31	Ore	2.168	164.3	26.5-1.5	25.	368.94
1/31	Conct.	22.599	194.6	35.5-1.5	20.296	4233.02
2/23	Conct.	6.120	199.6	34.5-1.5	33.	1212.04
2/23	Flot.	16.259	215.1	39.5-1.5	38.	3438.75
3/12	Ore	11.408	160.55	30.1-1.5	28.6	2008.46
3/22	screen	8.3335	80.44	17.2-1.5	15.7	769.41
3/22	Conct.	9.206	198.8	37.6-1.5	36.1	1675.58
5/1	Ore	10.088	114.4	25.8-1.5	24.3	1267.64
5/1	Flot.	13.9095	151.	24.6-1.5	23.1	1849.66
6/27	Ore	12.687	164.1	25.7-1.5	24.2	1376.87
6/27	Ore	11.662	142.4	22.3-1.5	20.8	920.40
		<u>138.832</u>				<u>\$21459.93</u>

DEVELOPMENT AND EQUIPMENT

ENERGY AND WATER COSTS:

It is unnecessary to refer to these items in this report, as they are ably covered in the report by Mr. F. Gibbs, E.M., who has entered into full details; and reference is therefore made to that report, and to the maps.

The same may also be said regarding proposed plans for betterment in the equipment, for changing the underground workings to facilitate the production of ore at less cost than is now possible under existing conditions, and for future development. But the writer offers a few suggestions for the latter item.

RECOMMENDATIONS:

Since improvements must be made in the mill, it would be well to consider so changing the present flow-sheet as to include a separation by concentration of the zinc from the lead in the milling ore, thus making a marketable zinc product and eliminating the penalty now charged for the zinc content in the concentrate now shipped. This would probably leave a low enough zinc content in the flotation product to escape the penalty therefor, now charged against all concentrate shipped.

In raising to the surface to make a working shaft of

management. It takes money to mine a mine, the same as it takes money to establish any other business. Once the improvements are made in these properties to permit of their operation and production at maximum capacity, there seems no question about the satisfactory results that will be derived in return.

The writer believes the properties are in capable and experienced hands, and that the present operators will efficiently and economically develop and operate them if they be placed in a financial position to make the needed improvements and carry on development work ahead of production and independent of it, so as to establish ore reserves as well as to develop the mine to depth where better conditions for ore must certainly exist than are found near the surface. All levels below the second level in the Arizona National should be driven the length of the property, as former work has practically proved that the greater part of this length is ore bearing.

Charles Edward Major

Registered Mining Engineer.

(SEAL)

Prescott, Arizona,
July 19, 1923.

PRESCOTT, ARIZONA,
May 21, 1925.

STATE OF ARIZONA,)
County of Yavapai) ss.

This is to certify that I have this day
compared the within and foregoing copy of mining
report with the original report, and that the same
is a full, true and correct copy of the same.

R. P. Jones

Notary Public

My commission expires
February 20, 1927.

REPORT OF THE ARIZONA NATIONAL PROPERTY
IN THE
BIG BUG MINING DISTRICT - YAVAPAI COUNTY, ARIZONA

By F. Gibbs

Location and Size -

The Arizona National mine property consists of one claim and mill site, both patented, about three miles southwest of the town of Humboldt, Yavapai County, Arizona.

Transportation facilities are excellent as the property is located but two miles from a loading siding on the P & S E. branch of the Santa Fe railroad and it is connected therewith by a good auto road, having a gentle down hill grade all the way from the mine to siding. Elevation at mine is about 4800 feet which makes for an excellent all year climate.

History -

The property was acquired in 1914 from a prospector named Williams by Mr. F. M. Anderson of Prescott, Arizona, who subsequently formed the Arizona National Mining Co. to facilitate the opening up and operation of the mine. At that time there was only a forty foot prospector's shaft sunk on the vein in a good showing of silver-lead ore. The name Arizona National was given to the mine after the name of the Co. but it was better known perhaps, as the Anderson throughout the immediate vicinity and county.

Subsequently to 1914, and under Mr. Anderson's supervision and direction, the mine was gradually opened up by sinking a shaft at successive intervals to a depth of 320 feet and the driving of drifts on the 100', 155', 205', and 320' levels. In 1915 and 1916 a 50 ton flotation mill was built and the mine and mill were then continuously operated in a small but profitable manner by Mr. Anderson until the fall of 1922. During this period, mill concentrates and high grade ore, to a value of approximately \$200,000 were shipped to the smelter. Various offers to buy or lease the mine by other parties were declined by the Co. However, in the fall of 1922, poor health

and advancing age influenced Mr. Anderson to give up operating and turn the mine over to leasers. From then until the slump in silver in 1930 the mine was operated practically continuously under lease. It has now been idle for about a year but will doubtless be reopened when the price of silver gets back to normal.

During the period of leasing, a new shaft was sunk to the 530' level and drifts run on the vein on the 370', 410', and 530'. Mining of ore was carried on all levels, and as is the case of most leasing operations, the mining of the ore kept pace with the development so that no developed ore reserve was ever established. The last lease of the mine has now expired so that the full control of it is again vested in Mr. Anderson who practically is the sole owner of the outstanding stock of the Arizona National Mining Co.

Production -

(Note: The following is a summary of the figures compiled by Mr. Anderson and shown by Mr. Gibbs for the shipments made to the El Paso smelter for the years 1915 to 1922 and 1922 to 1930, respectively. G.M.F.)

<u>Tons</u>	<u>A s s a y s</u>		<u>Net Smelter Returns</u>
	<u>Oz. Silver</u>	<u>% Lead</u>	
<u>1915 to 1922</u>			
1878	96.07	26.49	\$170,898.56
<u>1922 to 1930 (While mine was under lease)</u>			
468	174.63	29.67	\$ 63,399.15

Quite a number of smelter returns covering shipments by leasers in the last two years were lost in a fire which destroyed Mr. Anderson's home in August, 1931.

Total net smelter returns from the mine are therefore approximately \$240,000.00. Net smelter return is the gross return less freight and smelter charges and smelter deductions. These items on the above shipments are in the neighborhood of \$60,000.00 which would make the gross production of the mine about \$300,000.00.

Geology and Veins -

The country rocks of the district in which the mine is located can be divided into general classes -

- (1) Yavapai Schist, a very old foliated rock of Pre-Cambrian age formed by partial overturning and almost complete schisting of ancient sedimentary beds and interbedded igneous flows.
- (2) Bradshaw Granite, of eruptive origin and younger than the Yavapai schist.
- (3) Diorite, which in all probability is a phase of the Bradshaw Granite and which often is so schisted on its borders as to be almost indistinguishable from the Yavapai Schist.
- (4) Acid and Basic Dikes, of later origin than either of the above rocks which they intersect and which probably had considerable influence in the mineralization of the veins.

In the immediate proximity of the mine the main formation is the Yavapai Schist in its different phases, cut by several rhyolite and granite-porphry dikes. A considerable stock of diorite is intruded into the schist a short distance west of the property with dikes and stringers running out into the schist for considerable distances beyond its margin. One of these dikes forms the hanging wall of the Arizona National vein over a portion of its length. The Arizona National vein is probably an altered rhyolite dike which was fractured and broken by movement and then mineralized by hot ascending solutions which deposited their metals as they cooled on nearing the surface. It strikes approximately N. 26 E. and dips N.W. at an angle of about 70 from the horizontal, both dip and strike conforming with that of the adjacent schist. It can be traced on the surface over a distance of three miles with no breaks or faults of any kind. In general, the continuity and depth of mineralization of a vein can be taken as a function of its length, that is a long vein such as we have here can be expected to go to great depth. To the S.W. the vein eventually passes into the McCabe Gladstone property where a great deal of rich ore has been produced. At the Arizona National the average vein width is about four feet. The walls of the vein are hard and well

defined and stand well with very little timber required to hold them in mining. A well defined gauge occurs on both sides of the vein. Other veins parallel the main vein while still others intersect it at acute angles but no work has been done on any of these to determine their value. The vein is made up of the "gangue" consisting of quartz, calcite, rhodocrosite, manganese oxide and dolomite, and the ore which consists of the sulphide of lead, zinc and silver. After the deposition of the metals in the vein a long period of erosion occurred. During this period parts of these ores in the upper parts of the mine which were comparatively inactive chemically were worn away by erosion, while those parts of greater chemical activity were acted upon by meteoric waters and became leached in the upper zone with consequent secondary concentration lower down. Neither silver or lead are very active chemically, but in the Arizona National mine there is unmistakable evidence that some leaching and secondary concentration of these metals has taken place. This is borne out by the fact that the silver values of the ore has constantly increased as greater depth on the vein has been attained. It is reasonable to presume that the ore bodies occurring below permanent water level will be richer and more uniform in grade and extent than those which occur above. This condition will continue downwards until the zone of primary ores is reached, and which has not been affected by secondary concentration. Only exploration and development will tell just how deep or how extensive either of these zones may be. In the Arizona National mine there are evidences of oxidation and leaching 500 feet below the surface, which great depth of action gives foundation for the belief that the secondary zone will be correspondingly great in either depth or richness or both.

Ore -

As stated above the valuable metals are silver, lead and zinc in order named. The silver occurs chiefly as the sulphide, argentite, and occasionally as native, both forms occurring with the lead as argentiferous galena. Above the 155' level there were bunches of chloride and carbonate ore, but below that mostly sulphides which apparently increase in silver value with depth. An average value for the ore taken from the mine from the top to bottom would run approximately 15 ozs. silver, 3% lead and 4% zinc. This average includes the lower silver valued material mined on the upper levels. To date over 60% of the vein matter has been proven to be ore of this tenor. Between the 4th and 6th levels the average value is 20 ozs. silver, 3% lead and 4% zinc. Apparently each percent of zinc carries about 1/2 oz. silver, so that a concentrator designed for work on ore from this vein should perhaps include zinc saving equipment, if a proper market for zinc is found in Arizona and there seems to be strong likelihood of this taking place. The ore is soft, and this coupled with the steep pitch and hard, well defined walls permits of extraordinarily economical mining. In addition it is clean, so that crushing and concentrating are also economical. Some lenses carry sufficient high grade material to permit sorting and shipping direct without milling. This shipping ore averages about 180 ozs. silver and 35% lead to the ton. To date there has been about one ton of shipping ore to every thirty tons of milling ore. The ore occurs in the vein as lenses with the long axis running up and down the vein. One of these lenses has been mined all the way from the sixth level to within a short distance of the surface, and had a breadth of over one hundred feet along the strike. The ore in the lenses occurs as disseminations and streaks of sulphides throughout the vein matter and also in the richer parts as practically solid sulphide masses. These richer masses are shipped direct without milling, while the disseminated portions are put through the

mill. In all probability, when the zone of primary mineralization is reached at greater depth, it will be found that the lenses are really shoots whose power portions can be located with reasonable accuracy. It also seems probable, that as greater depth is attained especially in the south west part of the property that iron pyrite carrying gold will come to lend additional value to the ore.

Development -

There are two shafts sunk on the vein approximately 600 feet apart. The old shaft, or #1 is 320' deep and the new shaft or #2 is 540' deep. The old shaft has not been used except as an escape way and for ventilation for several years and is in need of some timbering, while #2 is in good condition throughout except between the 2nd and 3rd levels where it needs some straightening and timbering. From these two shafts about 5000' of drifts have been run on the vein, opening it for mining on the 100', 155', 220', 335', 370', 410', and 520' levels. All of these drifts with the exception of parts of the 100' and 220' levels are open and available for examination. With the exception of the 7th or 520' level, practically all of the ground has been stoped out above the different drifts as shown on a longitudinal section of the mine. Lack of adequate working capital on the part of the operators made it necessary to carry on the development and mining in a hand to mouth fashion or so that at no time, apparently was an adequate ore reserve developed ahead of mining operations. Because of this there is practically no developed ore in the mine at this time, all the lenses having been mined out as fast as the drifts opened them up.

Timber and Water -

There is no timber on the property, the vegetation consists chiefly of scrub oak, and mesquite. Seasoned mining timber is laid down at the railroad siding in carload lots at not over thirty dollars per thousand, board feet.

Water for domestic and milling purposes is obtained from Galena Gulch a quarter of a mile to the south. Some mill water comes from the mine but the latter has not reached sufficient depth to make enough water to supply the mill as it is not down to the permanent water level.

Conclusions -

A summary of the above paragraphs shows that the following conditions and facts obtain at the Arizona National mine.

- (A) Excellent location from the standpoint of transportation facilities and year round operation.
- (B) Good geological conditions from standpoint of commercial ore possibilities, both above and below permanent water level.
- (C) Strong, continuous, well mineralized vein of good average width and good walls enclosing soft easily mined and milled ore.
- (D) Average ore value high enough to permit of a good net profit per ton. Given adequate working capital for the proper development and equipment of the mine coupled with good management, these conditions are all that are necessary for making of a profitable enterprise. The development and operations of the mine to date though inefficiently carried on, has proved beyond the shadow of a doubt that these conditions actually prevail and that they can be relied upon to continue to be favorable in the future as in the past. In the writer's opinion, the mine has not had a chance to demonstrate its worth, or rather, it has demonstrated its worth in spite of the fact that it really hasn't had a fair chance.

Recommendations -

The previous inefficient method of operation must be abandoned and a definite, well planned development program undertaken in order that an adequate ore reserve may be built and maintained ahead of mining requirements. To this end I would recommend that the old #1 shaft be straightened and reconditioned and sunk to greater depth with drifts run both ways from it on the vein at regular intervals of 100'. Part of this shaft program could be carried out economically by raising from the 4th level which runs south from #2 shaft. The shaft should reach the 600' level and the vein be drifted on at intervals above that depth in order to develop a proper ore reserve ahead

Dec. 1, 1931

of the start of mining operations. Thereafter the sinking of a new 100' lift with attendant drifting on the vein should be carried out as necessary in order to maintain that ore reserve. A hoisting plant capable of handling at least fifty tons of ore per day from a depth of 1000' should be installed at that shaft and a compressor plant of at least three drill capacity. A mill should be installed and I think it would pay to look into the possibilities of profit from the recovery of zinc. The adjoining ground to the S.W. covering the extension of the vein in that direction should be acquired as the ground should properly be attached from #1 shaft and it is known to contain commercial ore shoots. It costs money to properly equip and develop a mine but in the case of the Arizona National I feel certain that the expenditure necessary in carrying out the above recommendations will be amply repaid over a long period of years, if the whole operation is efficiently managed, and assuming that silver will again enhance in price to at least sixty cents an ounce. That silver will do this I think is inevitable and those who realize this and have money to take advantage of the present bargain days should profit accordingly.

(Signed) F. Gibbs
F. Gibbs, E.M.
Humboldt, Arizona.
Dec. 1, 1931.

STATUS OF DORMANT MINES

MINE NAME: Mendon Arizona. (Arizona National).

LOCATION: Humboldt Arizona.

OWNER AND/OR LEASEE: Owner. (Now under lease & Option to Shattuck
Denn Mining Corp.)

ADDRESS: Humboldt, Arizona, P.O.Box 142. V.Alexander.

APPROXIMATE PRODUCTION (Year of 1945):

COPPER none Lbs. LEAD none Lbs.

ZINC none Lbs. (OTHER) none

CHECK THE CHIEF CAUSE OF YOUR DISCONTINUED PRODUCTION:

- (A) Easily available ore worked out.
- (B) Increased costs, but have quantity similar to past grade of ore.
- (C) Too close a margin to develop more ore.
- (D) Mine stopped work 1950: Sinking new shaft prior
to leaseing. Leases drilling at present.

If you have ore ready to mine please give your estimate of the amount of metal (name each metal) that you could produce in one year (after allowing 60 days to get started) if there were premiums above present market prices. Name amount with a low premium, and amount at a high premium; such as:

Copper at 22 $\frac{1}{2}$ ¢ plus 5¢ premium..... 1,000,000 Lbs.
Copper at 22 $\frac{1}{2}$ ¢ plus 10¢ premium..... 1,500,000 Lbs.

If you do not have ore ready to mine please discuss the following:

- (A) Do you think a reasonable development program would produce a justified tonnage of commercial ore at above mine?

I have every reason to believe ore can be
developed.

- (B) With a premium price (guaranteed for one year) could you carry out such a development program yourself? What premium?

So long as lease continues working I think
they are in a position to develop ore with
out a premium.

(C) If you could not do this yourself, would a quick drilling program by some government agency (at government expense) be sufficient?

(D) Or would you prefer a loan plan similar to the arrangements during World War II?

If leasee should fail to take up option
I would need a small loan to develop.

How about a combination plan in two stages such as follows?

Stage 1: Government engineers review project and, if a little drilling appears to be justified and a preliminary key to the situation, such drilling program to be agreed upon by owner and government engineer, paid for by the government, but let by contract.

Stage 2: If results of drilling (or without drilling) justify underground development and/or production equipment, same to be obtainable via a mortgage loan on property.

Please discuss the above: This is a lenticular vein and
to me drilling is a poor excuse for development, the mine
had a very good production record while operating and there
is good reason to expect it could be brought into production
again. I have all the needed equipment for development
ready to go. I expect Shattuck Denn will take up the option
and reopen the mine, what I have said is in case they should
give up the lease.

SUGGESTIONS:

DATE Aug. 1, 1950.

SIGNATURE Vernon Alexander.

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine Anderson Mine (Old Arizona Consolidated) Date Aug. 20, 1962
District Big Bug Dist., Yavapai County Engineer Lewis A. Smith
Subject: Interview With Fred Schultze, of Humboldt. - 4-25-62

Mr. Schultze reported a man by the name of Conger is in charge of sinking a shaft at the Anderson Mine. This work just started. Vernon Alexander is the owner.

Interview with Fred Schultze at Humboldt -7-24-62

Mr. Schultze reported that the shaft had been cleaned out, and repaired but at present no activity was evident. (7-25-62-Ivisited the mine, but no one was around).

LEWIS A. SMITH-8-28-62

DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA

FIELD ENGINEERS REPORT

(Arizona National)

Mine Anderson Mine (Old Arizona Consolidated) Date August 20, 1962
District Big Bug District - Yavapai County Engineer Lewis A. Smith
Subject: Interview with Fred Schultze of Humboldt

Mr. Schultze reported a man by the name of Conger is in charge of sinking a shaft at the Anderson Mine. This work just started. Vernon Alexander is the owner.

THE ARIZONA NATIONAL

REPORT

REPORT ON THE
ARIZONA NATIONAL PROPERTY
IN THE
BIG BUG MINING DISTRICT.
Yavapai County, Arizona.

By F. GIBBS, E.M.
Humboldt, Arizona.

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REPORT ON THE
ARIZONA NATIONAL PROPERTY
IN THE
BIG BUG MINING DISTRICT
YAVAPAI COUNTY, ARIZONA

LOCATION & SIZE:

The Arizona National Mine property consists of three and a fraction mining claims and a patented mill-site in the Big Bug Mining District of Yavapai County, Arizona, about three miles southwest of the town of Humboldt. One of the mining claims is patented and on it is located the Arizona National Mines. The other claims are unpatented.

Transportation facilities are excellent as the property is located but two miles from a loading siding on the P. & S. E. branch of the Santa Fe railroad and is connected therewith by a good auto road having a gentle down hill grade all the way from mine to siding.

Elevation at the mine is about 4800 feet which makes for an excellent all-year-round climate.

HISTORY:

The property was acquired in 1914 from a prospector named Williams by Mr. F. M. Anderson of Prescott, Arizona, who subsequently formed the Arizona National Mining Company to facilitate the opening up and operation of the mine. At that time there was only a forty foot prospector's shaft sunk on the vein in a good showing of silver-lead ore. The name "Arizona National" was given to the mine after the name of the company, but it is better known perhaps, as the "Anderson" throughout the immediate vicinity and the county.

Subsequent to 1914, and under Mr. Anderson's supervision and direction, the mine was gradually opened up by the sinking of a shaft at successive intervals to a depth of 320 feet and the driving of drifts on the 100', 155', 205' and 320' levels.

In 1915 and 1916 a 50 ton flotation mill was built and the mine and mill were then continuously operated in a small but profitable manner by Mr. Anderson until the fall of 1922. During this period, mill concentrates and high grade shipping ore to a value of approximately \$200,000 were shipped to the smelter. During this period, various offers to buy or lease the mine by other parties were declined by the company.

However, in September 1922, poor health and advancing age influenced Mr. Anderson to give up the operation and turn the mine over to leasers. From then until the slump in silver in 1930 the mine was operated practically continuously under lease. It has now been idle for about a year but will doubtless be reopened when the price of silver gets back to normal.

During the period of leasing, a new shaft was sunk to the 530' level and drifts run on the vein on the 370', 410' and 520' levels. Mining of ore was carried out on all levels, and, as is the case in most leasing operations, the mining of the ore kept pace with the development so that no developed ore reserve was ever established. The last lease on the mine has now expired so that the full control of it is again vested in Mr. Anderson who practically is the sole owner of the outstanding stock of the Arizona National Mining Company.

PRODUCTION:

Following herewith is a record of the shipments made to the smelter (El Paso) by Mr. Anderson from 1915 to 1922 incl:

DATE	TONS	, ASSAY VALUE ,		NET SMELTER RETURN
		Oz. Silver	% Lead	
Oct. 1915	38	85.0	16.4	\$ 1294.45
Nov. "	38	92.5	21.5	1616.65
Dec. "	32	109.2	28.6	2022.69
Apr. 1916	68	55.1	10.9	2053.71
" "	33	166.8	38.8	3818.53
June "	67	92.0	23.4	4621.36
Dec. "	12	66.0	21.2	680.81
" "	17	92.0	28.0	1354.91
Jan. 1917	37	85.2	25.0	2632.59
Feb. "	96	70.9	25.7	6527.45
Mar. "	30	75.4	32.4	2387.12
Apr. "	38	62.4	23.0	2177.96
May "	32	62.4	26.4	2146.17
July "	32	65.5	25.6	2262.93
Aug. "	94	56.9	24.8	60.57.24
Sept. "	35	62.5	24.6	2568.93
Oct. "	20	67.9	23.8	1141.41
" "	11	99.6	35.8	1030.17
Dec. "	30	89.9	19.9	2086.12
Jan. 1918	58	66.4	22.3	3447.98
Apr. "	33	49.4	23.2	1616.16
May "	29	66.9	24.5	2001.25
July "	31	78.2	26.3	2621.32
Aug. "	42	60.0	24.0	2553.18
Oct. "	37	97.8	26.2	3600.33
Dec. "	40	65.2	24.3	2649.59
Jan. 1919	36	52.1	22.9	1806.97
" "	33	86.6	24.4	2842.25
Apr. "	36	55.1	33.1	1917.76
May "	36	77.5	37.2	2723.26
June "	26	68.9	30.2	1832.00
" "	18	114.4	31.9	2072.92
Sept. "	26	106.2	28.2	3005.53
" "	29	125.9	26.2	3792.93
Nov. "	39	110.5	26.1	4988.50
Dec. "	16	129.5	33.9	2681.60
" "	19	177.5	39.5	4313.26

EXTRACTS FROM ORE SETTLEMENT SHEETS.

<u>Date</u>	<u>Values per ton</u>	<u>Dry Tons</u>	<u>Per ton</u>	<u>Gross Return</u>	
2/21/31	.03	128.5	18.167	48.31	616.35
10/24/30	.03	114.8	21.648	67.68	1465.14
10/24/30	.03	100.0	18.113	56.07	679.18
9/6/30		117.2	25.542	66.02	1686.28
7/1/30	.03	77.6	33.501	41.19	1371.67
5/28/30		114.2	35.6995	69.73	2489.33
4/18/30	.05	95.6	9.0385	57.53	485.83
4/18/30	.03	130.5	31.797	78.86	2507.51
2/20/30		51.5	32.643	28.45	928.69
1/25/30		57.7	29.5475	36.48	1070.01
1/3/30		79.0	23.450	52.09	1221.51
1/3/30	.05	118.8	7.679	80.01	614.40
11/2/29		68.6	34.896	48.24	1683.38
7/16.29	.04	224.6	29.4725	123.99	3654.30
2/7/29		224.4	4.617	132.22	610.46
2/7/29		184.1	16.5845	105.20	1711.52
10/18/28	.05	262.0	7.573	166.06	1257.57
10/18/28		148.0	5.891	84.70	498.97
10/18/28		104.5	2.1985	61.27	129.19

24,679.31

DATE	TONS	ASSAY VALUE		NET SMELTER RETURN
		Oz. Silver	% Lead	
Jan. 1920	15	106.6	26.8	\$2078.87
" "	23	148.7	37.9	4581.65
Feb. "	15	118.2	18.8	2253.22
" "	21	136.9	26.6	3167.24
Mar. "	9	95.0	18.8	917.53
" "	21	148.4	31.9	3871.22
July "	30	121.0	22.4	3611.21
Sept. "	52	122.0	29.2	6697.95
Oct. "	26	71.1	19.9	1645.45
Dec. "	11	133.0	26.6	1292.95
" "	19	88.3	28.0	1443.57
Feb. 1921	14	85.5	7.1	806.92
" "	11	85.9	29.8	774.96
July "	30	132.0	31.9	3354.43
Sept. "	40	166.4	30.3	58.95.82
Oct. "	32	150.2	43.9	4421.72
Dec. "	36	153.9	37.7	5080.73
Apr. 1922	29	171.7	32.1	4462.95
May "	6	165.8	36.2	934.84
" "	23	150.8	29.8	4118.57
July "	30	153.5	27.9	4218.63
Sept. "	24	167.1	25.7	3694.89
Nov. "	13	214.6	36.2	2707.85

\$170898.56 Total

Following is a record of some of the shipments made from 1922 to 1930 inclusive while the mine was under lease:

Dec. 1922	14	180.8	29.0	\$ 2339.16
" "	1	163.0	52.0	
Jan. 1923	2	164.0	26.0	4601.96
" "	23	194.6	29.8	
Feb. "	6	279.6	34.5	4650.79
" "	16	215.1	39.5	
Feb. "	11	160.5	30.1	4453.45
" "	8	88.4	17.2	
" "	9	198.8	37.6	
Mar. "	33	175.9	32.5	5969.22
Apr. "	14	151.0	24.6	3117.30
" "	10	114.4	25.8	
May "	20	194.2	23.4	3549.75
" "	15	184.1	25.7	2417.27
" "	12	142.4	22.3	

June 1923	4	140.8	21.9	2667.62
" "	15	268.4	36.3	
July 1923	24	282.4	42.5	5016.93
" "	8	140.5	25.5	
Aug. "	14	180.6	54.3	5026.00
" "	16	318.0	47.0	
Sept. "	22	334.5	53.5	6577.29
" "	4	191.6	25.6	
" "	7	205.4	36.5	
Dec. "	16	248.6	41.3	3005.24
" "	5	201.3	36.8	
Apr. 1924	15	200.8	27.0	2055.97
June "	4	62.5	36.7	279.81
" "	26	85.7	41.3	20088.97
Oct. 1925	17	97.2	25.9	1363.53
" "	5	57.4	5.8	198.77
Feb. 1926	18	109.2	16.2	1216.35
Nov. 1927	42	33.6	3.3	472.01
Feb. 1928	4	113.2	13.1	281.45
Apr. 1928	5	128.5	13.7	548.79
Feb. 1929	17	164.1	22.8	<u>1711.52</u>
Total			\$	63389.15

(Note: Quite a number of smelter return sheets covering shipments by leasers in the last two years were lost in a fire which destroyed Mr. Anderson's home in August, 1951).

Total net smelter returns from the mine are therefore approximately \$240,000.00. "Net smelter return", is the gross return less freight and smelter charges and smelter deductions. These three items on the above shipments are in the neighborhood of \$80,000.00 which would make the gross production of the mine about \$300,000.00.

GEOLOGY & VEINS:

The country rocks of the district in which the mine is located can be divided into four general classes:

- (1) Yavapai Schist, a very old foliated rock of Pre-Cambrian age formed by the partial overturning and almost complete schistification of ancient sedimentary beds and interbedded igneous flows.

- (2) ~~Bradshaw~~ Granite, of eruv tive origin and younger than the Yavapai Schist.
- (3) Diorite, which in all probability is a phase of the Bradshaw Granite and which is often so schisted on its borders as to be almost indistinguishable from the Yavapai Schist.
- (4) Acid and Basic Dikes, of later origin than either of the above rocks which they intersect and which probably had considerable influence in the mineralization of the veins.

In the immediate proximity of the mine the main formation is the Yavapai Schist in its different phases, cut by several rhyolite and granite-porphry dikes. A considerable stock of diorite is intruded into the schist a short distance west of the property with dikes and stringers running out into the schist for considerable distances beyond its margin. One of these diorite dikes forms the hanging wall of the Arizona National vein over a portion of its length.

The Arizona National vein is probably an altered rhyolite dike which was fractured and broken by movement and then mineralized by hot ascending solutions which deposited their metals as they cooled on nearing the surface. It strikes approximately N. 26° E. and dips northwesterly at an angle of about 70° from the horizontal, both dip and strike conforming with that of the adjacent schist. It can be traced continuously on surface over a distance of three miles with no breaks or faults of any kind. In general, the continuity and depth of mineralization of a vein can be taken as a function of its length, that is, a long vein such as we have here can be expected to go to great depth. To the southwest the vein eventually passes into the McCabesgladstone property where a great deal of rich ore has been profitably mined. At the Arizona National the average vein width is about four feet. The walls of the vein are hard and well defined and stand well with very little timber required to hold them in mining. A well defined gauge occurs on both sides of the vein.

Other veins parallel the main vein while still others intersect it at acute angles but no work has been done on any of these to determine their value.

The vein filling is made up of the "gangue" consisting of quartz, calcite, rhodocrosite, manganese oxide and dolomite, and the ore which consists of the sulphide of lead, zinc, and silver.

After the deposition of the metals in the vein a long period of erosion occurred. During this period, parts of those ore bodies in the upper parts of the veins which were comparatively inactive chemically were worn away by erosion, while those parts of greater chemical activity were acted upon by meteoric waters and became leached in the upper zone with consequent secondary concentration lower down. Neither silver nor lead are very active chemically, but in the Arizona National mine there is unmistakable evidence that some leaching and secondary concentration of these metals has taken place. This is borne out by the fact that the silver value of the ore has constantly increased as greater depth on the vein has been attained. It is reasonable to suppose that the ore bodies occurring below permanent water level will be richer and more uniform in grade and extent than those which occur above. This condition will continue downwards

until the zone of primary ores is reached and which has not yet been effected by secondary concentration. Only exploration and development work will tell just how deep or how extensive either of these zones may be. In the Arizona National mine there are evidences of oxidation and leaching 500 feet below surface, which great depth of action gives foundation for the belief that the secondary zone will be correspondingly great in either depth or richness or both.

ORE:

As stated above, the valuable metals are silver, lead, and zinc in order named. The silver occurs chiefly as the sulfide, argentite, and occasionally as native, both forms occurring with the lead as argentiferous galena. Above the 155' level there were bunches of chloride and carbonate ore, but below that mostly sulphides which apparently increase in silver value with depth.

An average value for the ore taken from the mine from top to bottom would run approximately 15 oz. silver, 3% lead, and 4% zinc. This average includes the lower-silver-value material mined on the upper levels. To date over 60% of the vein matter has been proven to be ore of this tenor. Between the 4th and 6th levels the average value is 20 oz. silver and 3% lead, and 4% zinc. Apparently each per cent of zinc carries about 1/2 oz. of silver, so that a concentrator designed for work on ore from this vein should perhaps include zinc-saving equipment, if a proper market for the zinc is founded in Arizona and there seems to be a strong likelihood of this taking place.

The ore is soft, and this, coupled with the steep pitch and hard, well-defined walls permits of extraordinarily economical mining. In addition, it is clean, so that crushing and concentrating are also economical. Some lenses carry sufficient high grade material to permit sorting and shipping direct without milling. This "shipping ore" averages about 100 oz. silver and 35% lead to the ton. To date there has been about one ton of "shipping ore" to every thirty tons of milling ore.

The ore occurs in the vein as lenses with the long axis running up and down the vein. One of these lenses has been mined all the way from the sixth level to within a short distance of the surface and had a breadth of over one hundred feet along the strike.

The ore in the lenses occurs as disseminations and streaks of the sulphides throughout the vein matter and also in the richer parts, as practically solid sulphide masses. These richer masses are shipped direct without milling while the disseminated portions are put thru the mill. In all probability, when the zone of primary mineralization is reached at greater depth, it will be found that the lenses are really sheets whose lower portions can be located with reasonable accuracy. It also seems probable, that as greater depth is attained, especially in the southwest part of the property, that iron pyrite carrying gold will come in to lend additional value to the ore.

DEVELOPMENT:

There are two shafts sunk on the vein approximately 600 feet apart. The old shaft, or "No. 1" is 230' deep, and this new shaft, or "No. 2" is 540' deep. The old shaft has not been used except as an escape way and for ventilation for several years and is in need of some timbering, while No. 2 shaft is in good condition throughout except between the second and third levels where it needs some straightening and timbering.

From these two shafts about 5000 feet of drifts have been run on the vein, opening it for mining on the 100', 155', 220', 335', 370', 310' and 520' levels. All of these drifts with the exception of parts of the 100' and 220' levels are open and available for examination. With the exception of the 7th, or 530' level, practically all of the ground has been stoped out above the different drifts as shown on a longitudinal section of the mine attached hereto. Lack of adequate working capital on the part of the operators made it necessary to carry on the development and mining work in a hand-to-mouth fashion so that at no time, apparently, was an adequate ore reserve developed ahead of mining operations. Because of this there is practically no developed ore in the mine at this time, all lenses having been mined out as fast as the drifts opened them up.

EQUIPMENT:

The mine equipment now on the property is obsolete and inadequate for proper operation. A small compressor plant consisting of a one drill compressor belt-driven by a 25 H.P. semi-Diesel engine is in good condition but not large enough. There is a considerable quantity of pipe and rail both in the mine and on surface and there are sufficient corrugated iron buildings to house the mine plant and blacksmith shop.

The 50 ton flotation mill originally consisted of crusher, ball mill, flotation cells, blower and Wilfley tables together with the necessary conveyor belts and bucket elevators. All mill machinery is driven by a 50 H.P. semi-Diesel engine. Some of the smaller units such as the crusher and one table have been recently removed. The mill needs a complete overhauling, but because of the excellent millable qualities of the ore it can be put in shape for the handling of 50 tons of ore a day by the expenditure of a few thousand dollars.

TIMBER AND WATER:

There is no timber on the property, the vegetation consisting chiefly of scrub oak, squaw berry, and mountain mahogany. Seasoned mining timber is laid down at the railroad siding in carload lots at not over thirty dollars per thousand board feet.

Water for domestic and milling purposes is obtained from Galena gulch a quarter mile to the south where a dam and small pumping plant is installed. Some mill water comes from the mine but the latter has not yet reached sufficient depth to make enough water to supply the mill as it is not yet down to the permanent water level. Above the dam on Galena Gulch, which is located on the millsite, there is also a good spring on the company's property which could easily be developed if more water was required.

CONCLUSION:

A summary of the above paragraphs shows that the following conditions and facts obtain at the Arizona National Mine:

- (A) Excellent location from the standpoint of transportation facilities and all-year-round operation.
- (B) Good geological conditions from the standpoint of commercial ore possibilities, both above and below the permanent water level.
- (C) Strong, continuous, well mineralized vein of good average width and good walls enclosing soft, easily mined and milled ore.
- (D) Average ore value high enough to permit of a good net profit per ton.

Given adequate working capital for the proper development and equipment of the mine coupled with good management, these conditions are all that are necessary for the making of a profitable mining enterprise.

The development and operation of the mine to date, though inefficiently carried on, has proved beyond the shadow of a doubt that these conditions actually prevail and that they can be relied upon to continue to be as favorable in the future as in the past. In the writer's opinion, the mine has not had a chance to demonstrate its worth, or, rather, it has demonstrated its worth in spite of the fact that it really hasn't had a fair chance.

RECOMMENDATION:

The previous inefficient method of operation must be abandoned and a definite, well planned development program undertaken in order that an adequate ore reserve may be built up and maintained ahead of mining requirements. To this end I would recommend that the old or No. 1 shaft be straightened and reconditioned and sunk to greater depth with drifts run both ways from it on the vein at regular 100 foot intervals. Part of this shaft program could be carried out economically by raising from the No. 4 level which runs south from No. 2 shaft. The shaft should reach the 600' level and the vein be drifted on at intervals above that depth in order to develop a proper ore reserve ahead of the start of mining operations. After that, the sinking of a new 100' lift with attendant drifting on the vein should be carried out at intervals as necessity demanded in order to maintain that ore reserve.

A hoisting plant capable of handling at least fifty tons of ore a day from a depth of 1000' should be installed at that shaft and a compressor plant of at least three drill capacity.

The mill should be reconditioned where needed and I think it would pay to look into the possibilities of profit from the recovery of zinc.

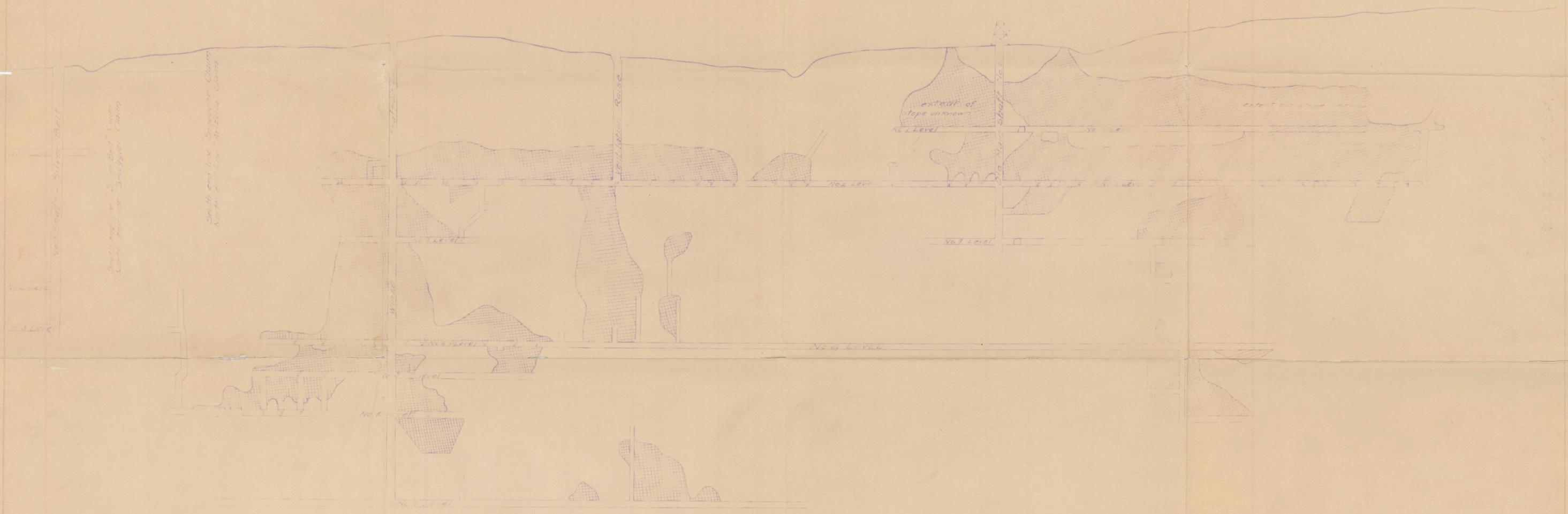
The adjoining ground to the southwest covering the extension of the vein in that direction should be acquired as that ground should properly be attacked from the No. 1 shaft and it is known to contain commercial ore shoots.

It costs money to properly equip and develop a mine but in the case of the Arizona National I feel certain that the expenditure necessary in carrying out the above recommendations will be amply repaid over a long period of years, if the whole operation is efficiently managed, and assuming that silver will again enhance in price at least sixty cents an ounce. That silver will do this I think is inevitable and those who realize this and have the money to take advantage of the present bargain days should profit accordingly.

F. GIBBS, E.M.,
Humboldt, Arizona.
December 1, 1931.

SILVER BELT - SMUGGLER

ARIZONA



Note: Hatched areas are slopes

SHEET-1A

LONGITUDINAL SECTION
 ARIZONA NATIONAL MINE
 HUMBOLDT, ARIZONA
 Scale 1 in = 50 ft
 Date _____
 Development in Ore Previous Month _____ ft
 Development in Waste Previous Month _____ ft
 Cu-Ft Ore Stopped _____ ft

ARIZONA SILVER COMPANY