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07/26/89

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES FILE DATA

PRIMARY NAME: COPPERVILLE

ALTERNATE NAMES:

LUCKY PENNY
SILVER DOLLAR
ROYAL BLUE
LUCK DAY
HOLLINGSWORTH
SIDELINE
GOLD KING (SPANISH ARRASTRA)
SIAMESE GROUP
BERKELY

MOHAVE COUNTY MILS NUMBER: 484A

LOCATION: TOWNSHIP 17 N RANGE 14 W SECTION 18 QUARTER SW
LATITUDE: N 34DEG 51MIN 10SEC LONGITUDE: W 113DEG 48MIN 24SEC
TOPO MAP NAME: DIAMOND JOE PEAK - 7.5 MIN

CURRENT STATUS: PAST PRODUCER

COMMODITY:

SILVER
LEAD SULFIDE
ZINC
GOLD LODE
COPPER

BIBLIOGRAPHY:

ADMMR COPPERVILLE FILE
ADMMR MOHAVE CUSTOM MILL PROJECT
SCHRADER, F.C. "MIN. DEPTS OF CRBT RNGE, BLCK
MTNS, GRND WSH CLFS, AZ" USGS BULL 340, P 71
SCHRADER, F.C. "MIN. DEPTS OF CRBT RNGE, BLCK
MTNS, GRND WSH CLFS, AZ" USGS BUL 397 P 141-2
WEED'S MINES HANDBOOK, 1916, P 173-4
MALACH, R., "MOHAVE CTY MINES", P. 28, 1977
KINGMAN MINING PROJECT-1 CLAIM MAP
LIGHT, THOMAS D "MIN. INVEST. OF CROSSMAN PK
WILDERNESS STUDY AREA" 1983 (ADMMR GEO FILE)

09/19/85

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES FILE DATA

PRIMARY NAME: COPPERVILLE

ALTERNATE NAMES:

LUCKY PENNY	GOLD KING (SPANISH ARRASTRA)
SILVER DOLLAR	SIAMESE GROUP
ROYAL BLUE	BERKELY
LUCK DAY	SIDELINE
HOLLINGSWORTH	

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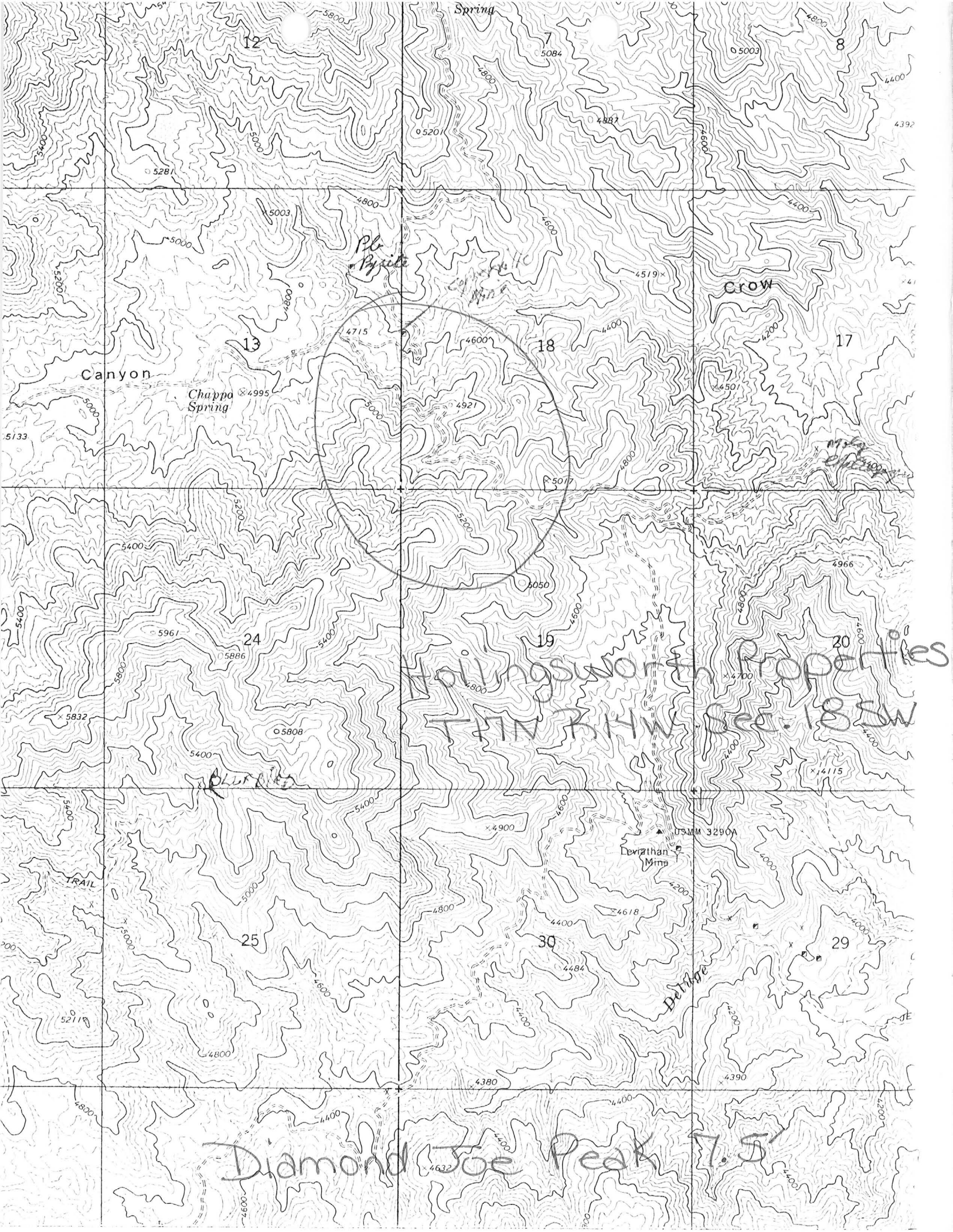
COMMODITY:

SILVER-PRIMARY
LEAD-(M) SULFIDE-COPRODUCT
ZINC-COPRODUCT
GOLD-(M) LOSE-BYPRODUCT
COPPER-BYPRODUCT

BIBLIOGRAPHY:

USGS DIAMOND JOE PEAK QUAD
ADMR HOLLINGSWORTH PROPERTIES MINE FILE
ADMR MOHAVE CUSTOM MILL PROJ. CARD FILE
SCHRADER, F.C., USGS BULL 340, P. 71
SCHRADER, F.C., USGS BULL 397, P. 141-142
WEED, W.H., MINES HANDBK. 1916, P. 173-174
MALACH, R. MOHAVE COUNTY MINES, P. 28
ADD. WORKINGS T16.5N-R14W, S. 12,13-T17N-R15W

KINGMAN MINING PROJECT-1 CLAIM MAP
GEO FILE, LIGHT, THOMAS D., ET AL, 'MINERAL
INVESTIGATION OF THE CROSSMAN PEAK WILDER-
NESS STUDY AREA, 1983



Name of Mine or Prospect:		Township	Range	Section	Priority
Sideline		17N	15W	13 adb	C
Principal Minerals:		1:250,000 Quad		7.5' - 15' Quad	
		Prescott		Diamond Joe Peak	
Associated Minerals:		District		Principal Product	
		Maynard			
Type of Operation:		County	State	Type of Deposit	
Underground: Shaft		Mohave	Ar.		
Ownership or Controlling Interest:					
Consult tax assessment records.					
Access: From Wikieup, Ar., proceed north on U.S. 93 for 7 miles. Turn left on light duty road for 10 miles. Mine is shown (unnamed) on topographic quadrangle.					
Structural Control or Geological Association:					
"Older Precambrian Age; granite gneiss." ¹					
Age of Mineralization:					
Production History			Geochemical Analyses		
Patented claims (2) Book #203 MS #2563					
References					
1) Wilson & Moore (1959) Geologic map.					

Name of Mine or Prosp : Siamese		Townsh 17N	Range 14W	Section 18	Priority A												
Principal Minerals: Chalcopyrite, Galena, Silver		1:250,000 Quad Prescott		7.5' - 15' Quad Diamond Joe Peak													
Associated Minerals: Quartz, Calcite, Gold		District Maynard		Principal Product Silver, copper, lead													
Type of Operation: Surface; Underground		County Mohave	State Ar.	Type of Deposit Vein													
Ownership or Controlling Interest: Consult tax assessment records																	
Access: From Wikieup, Ar., proceed north on U.S. 93 for 7 miles. Turn left on light duty road into Deluge Wash and travel 12 miles. Mine is shown (unnamed) on topographic quadrangle.																	
Structural Control or Geological Association: "The country rock seems to be the Precambrian granitoid complex. It is intruded by 'porphyry' nearby. The deposits are contained principally in a large fissure vein which strikes north-northwest and the quartz outcroppings have a length of nearly 2 miles. The gangue is principally quartz and the ore contains copper, lead, silver and gold." ¹																	
Age of Mineralization:																	
Production History			Geochemical Analyses														
Patented claims Bk #203 MS #2563			<u>Assay (1909)¹</u> <table border="0"> <tr> <td>Silver</td> <td>14 oz/ton</td> <td>35 oz/ton</td> </tr> <tr> <td>Copper</td> <td>4%</td> <td>10.5%</td> </tr> <tr> <td>Lead</td> <td>9%</td> <td>16.0%</td> </tr> <tr> <td>Zinc</td> <td>2%</td> <td>--</td> </tr> </table>			Silver	14 oz/ton	35 oz/ton	Copper	4%	10.5%	Lead	9%	16.0%	Zinc	2%	--
Silver	14 oz/ton	35 oz/ton															
Copper	4%	10.5%															
Lead	9%	16.0%															
Zinc	2%	--															
References																	
1) Schrader (1909) p. 141-142. 2) Mallach (1977) p. 3) CETA map file, Rack #9, claim map.																	

SIAMESE GROUP

Information from KAP 7/9/73:

J.H. Hoffman

Pittsburg 1 & 2 Sec. 12, 17N 15W

Siamese 1 & 2

Side Line 1 & 2 Sec. 13 17N 15W

Walter L. Hoffman, *owner*

415 W. 1st Street

Enterprise, Kansas 67441

Mr. Behunin, 7376 S. 1300 W. Jordan, Utah 84084 was in for information on the Siamese Group in the Cedar Valley District. He has obtained a two year lease-option on the property from the Hoffmans and he has hopes of developing the property.
KAP WR 5-9-74

* USBM 111, p. 52

Hollingsworth Properties (file)

Kingman Mining Project - 1 claim map

Arizona Copper Company Developed Mine.
G.L. 4/13/78 A.P.

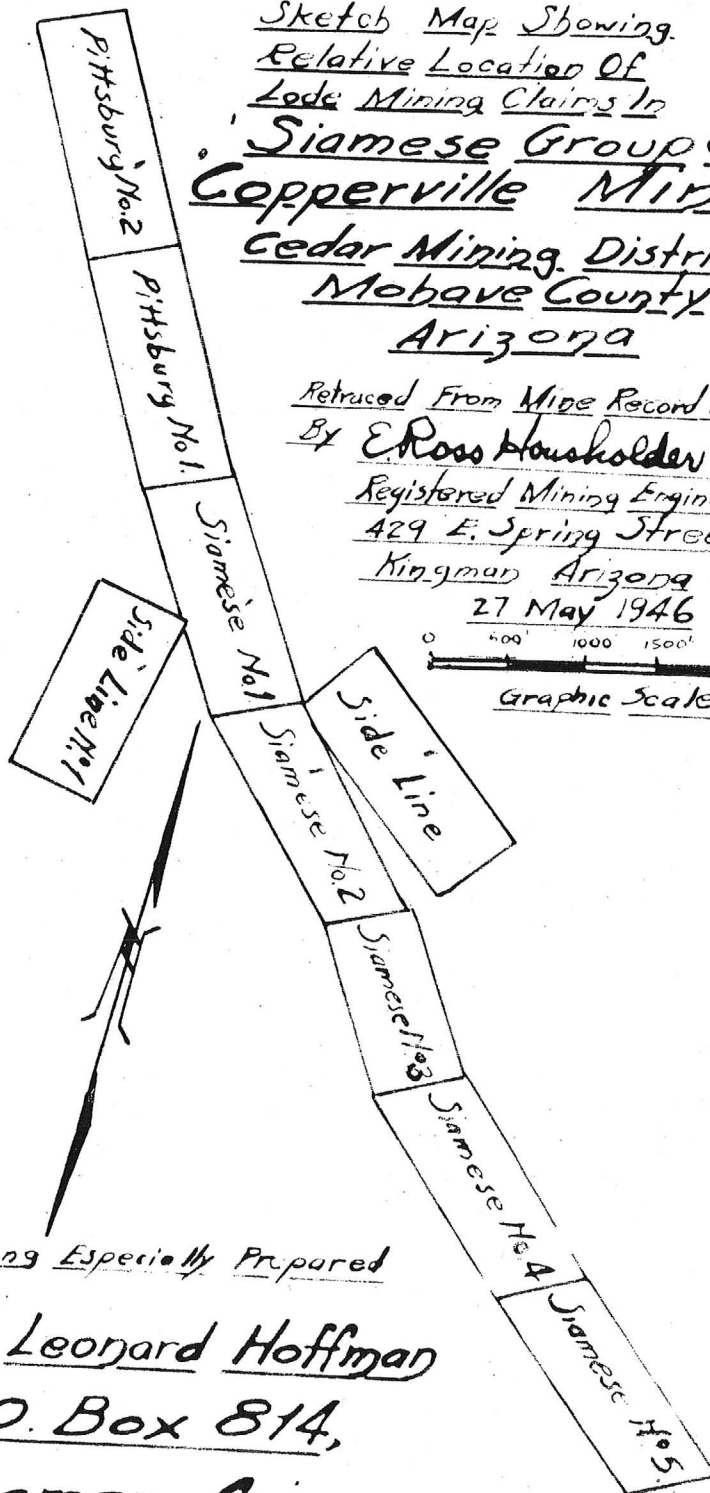
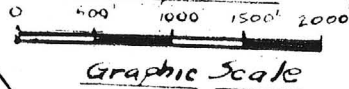
KAP WR 5/5/80: Sel Dimmer reported he has a lease purchase agreement on the Copperville Mine and Diamond Joe Mine, In Mohave County. He said the Diamond Joe has shipped to Inspiration Consolidated Copper during the last decade. One shipment contained ore with 10 tr.oz/ton silver and the second shipment 25 tr.oz./ton silver. He said his group is presently conducting milling tests on ore at the Diamond Joe and are able to produce 12-1 concentrate which recovers 4.8 of the 5.3 tr.oz/ton Ag in the ore. They have an agreement with Jerry Shupe in which he is to supply equipment and operating expenses.

CJH WR 9/12/80: Sylvester Dimmer, 9057 N. 52nd Avenue, Phoenix, Arizona 85302, holds lease with purchase option on the Diamond Joe and Copperville Mines, Mohave County. He also staked some contiguous claims around the patented Diamond Joe Claims. Gulf Mineral Resources Co. has surrounded the Copperville Mine with claims.

DO NOT REPRODUCE

Sketch Map Showing
Relative Location Of
Lode Mining Claims In
Siamese Group Of
Coperville Mine
Cedar Mining District
Mohave County
Arizona

Retraced From Mine Record Map
By E. Ross Hausholder E.M.
Registered Mining Engineer
429 E. Spring Street,
Kingman Arizona
27 May 1946



Tracing Especially Prepared
For
Mr. Leonard Hoffman
P.O. Box 814,
Kingman, Arizona

A horizontal line with tick marks at 0, 100, 200, 300, 400, and 500 feet. The text "Graphic Scale" is written below the line.

See - Siamese Group


May 1916

Mojave County

Reports come from Copperville via
Yucca of considerable activities in
that region. The Copperville mill is
now in operation and turning out a
good grade of lead and zinc concen-
trates.

AUG. 9, 1983

Northern Miner Pato



SUMMARY

Copperville Mine comprises nine patented claims located 20 miles northwest of Wickieup, Arizona.

The principal vein is evident by outcrop for a length of 10,500 ft. and where developed has been found to correspond to the showing underground. Mill run ore assays \$27.45 per ton, silver 5.01 oz/ton (\$6.50); lead 2.6% (\$7.30); zinc 4.3% (\$12.50); gold 0.01 oz/ton (0.35); Copper 0.25% (\$1.80).

Leaching displacement of surface copper by iron is evident in the 200 foot tunnels which strongly indicate substantial increases in the copper values at water level possibly 600 feet deep. Where found unaltered in quartz the copper mineral assayed 28.4% copper and 36.4% iron.

Four ore shoots contain a proven 150,000 tons of ore (\$4,000,000) to a depth of 100 to 300 feet and each additional 100 feet of depth contains a further 125,000 tons of ore (\$3,500,000.).

The extent of the vein on the surface gives assurance of permanency in depth.

Mining and processing are estimated to cost \$10.00 per ton which would yield a pretax profit of \$4,360,000 at a 1000 ton per day operating rate. A relatively simple mining and processing installation should produce a 15:1 concentrate at 90 - 95% recovery with a shipping value of \$375. per ton. Capital cost of mine and mill for this capacity should not exceed \$2,000,000.

Fifty thousand tons of tailings suitable for reprocessing are estimated, based on sampling to have an average value of \$15.00 per ton for a net recovery value in the range of \$500,000.

In the early 1900's \$750,000 was spent on the property to sink two shafts of 305 feet and 222 feet depths with over one mile of underground drifts and tunnels. Low market value of the metals plus wagon transport and lack of fuel prevented continued operation.

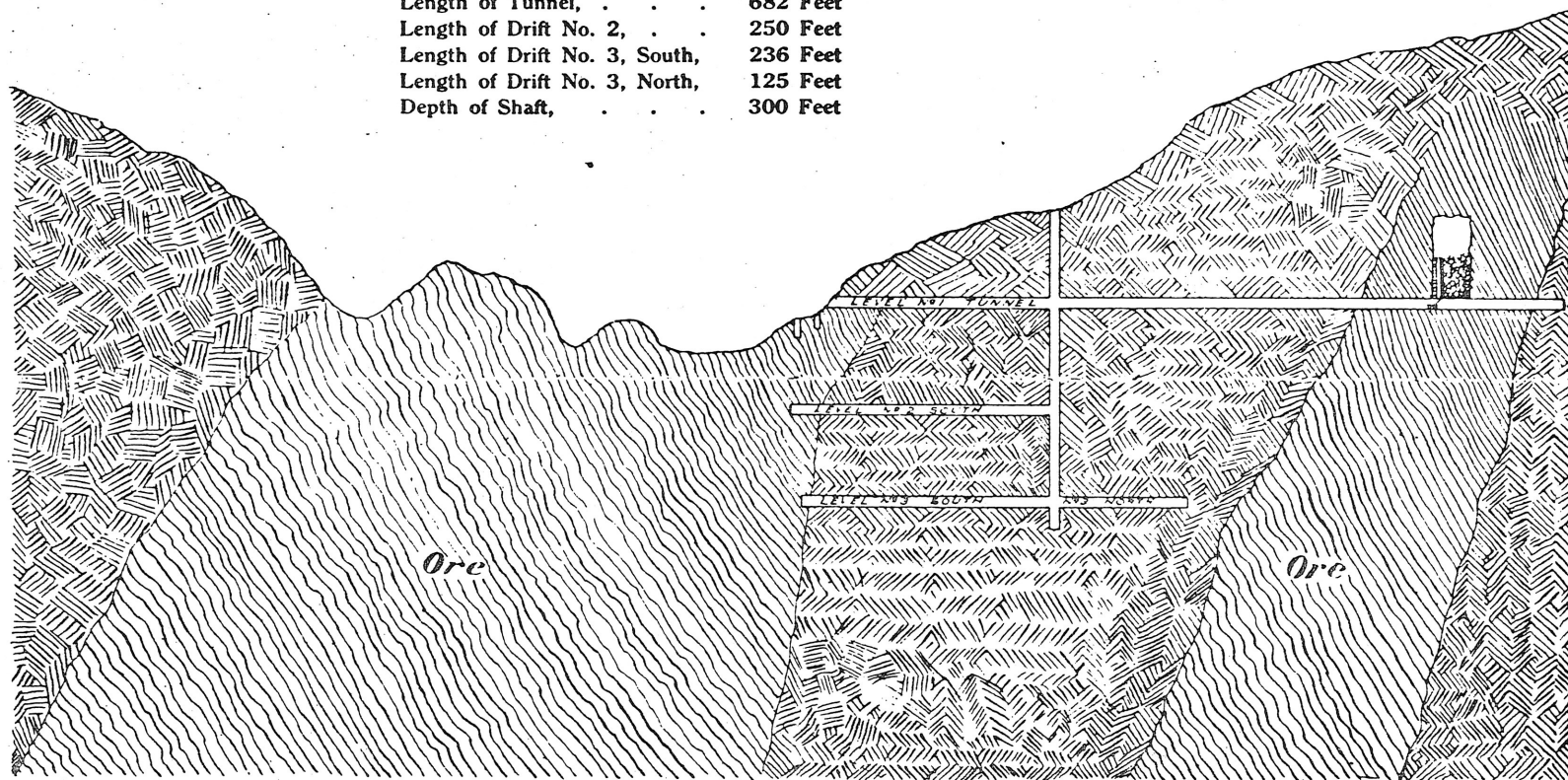
The Copperville property is a well proven mineral deposit in the east slope of the Hualapai Mountain range which is a continuous 30 mile mineral belt.

The Copperville claims are in the middle of the belt.

Good roads, motorized transport, low cost oil fuel, modern mining and mineral recovery will make this property an outstanding mineral producer and profitable operation.

Sectional Map Showing Underground Workings

Length of Tunnel, . . .	682 Feet
Length of Drift No. 2, . . .	250 Feet
Length of Drift No. 3, South, . . .	236 Feet
Length of Drift No. 3, North, . . .	125 Feet
Depth of Shaft, . . .	300 Feet



MISCELLANEOUS ASSAYS

Sample Designation	Gold oz/T	Silver oz/T	Lead %	Zinc %	Copper %
West Tunnel	0.08	23.0	11.0	Tr	0.34
4117	Tr	2.5	0.7	1.1	NR
4118	.02	1.0	0.8	0.5	NR
4119	.02	7.0	2.9	0.2	NR
4120	.02	16.5	19.5	7.7	NR
4121	.04	49.5	18.3	6.8	NR
4122	-	115.7	41.5	0.8	NR
Vein Surface #3	.05	3.7	5.6	2.1	1.18
Vein Surface #4	-	0.9	1.6	1.3	-
#4	Tr	0.3	-	-	0.22
5	.01	0.7	-	-	1.66
6	.06	16.8	4.3	1.3	1.86
Concentrates	2.10	21.67	13.76	3.90	3.39
4140	-	3.0	1.4	0.9	-
4141 (Conc)	Tr	66.5	33.75	4.3	0.60
4142	.04	57.6	26.80	5.10	0.25
4143	-	50.8	23.80	5.0	-
4144	-	39.2	22.0	6.9	-

ECONOMICS

BASIS: 1000 Tons of ore per calendar day
Ore Assay: 5.01 oz. Silver; 2.6% Lead; 43% Zinc; 0.25% Copper;
0.01 Gold
Metal Value \$27.45 per ton
Mining & Milling Cost \$10.00 per ton
Concentration Ratio 15/1
Concentrate production 67 tons per day
Mill recovery 90% of minerals
Smelter Settlement 80% of metal value

Income: Smelter settlement	Dollars/Year
1000 TDX 27.45 \$/T x 0.80 Rec. x 365 D/Y	= 8,040,000

Expenses

1000 TD x 10.00 \$/T M&M x 365 D/Y	= <u>3,650,000</u>
Profit before depreciation, depletion, taxes	\$ 4,390,000

Capital Cost

Mining facilities	500,000
Milling facilities	<u>1,500,000</u>
	2,000,000

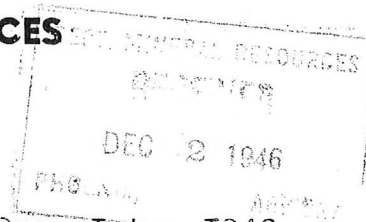
Depreciation basis 10 years	<u>200,000</u>
	4,190,000
Depletion 15% of 8,000,000	<u>1,200,000</u>
Taxable Income	2,990,000

Income Tax 48%	<u>1,440,000</u>
After tax income	\$ 1,550,000
Depletion Income	<u>1,200,000</u>
Net Income per Year	<u><u>\$ 2,750,000</u></u>

$\frac{2,750,000}{2,000,000} = 138\%$ return on capital/yr.

*

DEPARTMENT OF MINERAL RESOURCES
State of Arizona
MINE OWNER'S REPORT



Date.....Dec. 1st 1946.....

1. Mine:.....SIAMESE GROUP.....Camp is better known as Copperville.....
2. Location: Sec.....Twp.....Range.....Walapai.....Nearest Town.....Yucca
Distance 25 Miles.....Direction.....Road Condition.....
3. Mining District & County.....Cedar.....Mohave.....
4. Former Name of Mine:.....No former Name.....
5. Owner:.....Walter L. Hoffman. Leonard Hoffman resident Agent.....
Address:.....Box 814 Kingman Ariz.....
6. Operator:.....
Address:.....
7. Principal Minerals:.....Lead, XX Zinc, Copper, Silver and Gold.....
8. Number of Claims:.....Nine, seven on Lode on vein,.....Placer two on side.....
Patented.....All patented.....Unpatented.....All taxes paid including 46.....
9. Type of Surrounding Terrain:.....Lowest point elevation 4600 to 5000 at the shaft
No. 2 4700, For futher information Read Carl Anerson report.
.....
.....and maps inclosed and ~~XX~~ Leonard Hoffman Box 814 Kingman Ariz.....
10. Geology & Mineralization:.....I live in Kingman I will be ready to show preopert
any time, but through Holy days write me a few days ahead as I
may ~~be~~ be with some of my children near Los Angeles .
.....
.....Vavorable terms will be given to right partise
.....
.....Under My managemen t all ~~XX~~ underground work was done except
the second 2 00 feet shaft sinking on shaft No. 2.....
11. Dimension & Value of Ore Body:.....

Leonard Hoffman
Box 814
Kingman Ariz

*
Please acknowledge
Receipts

NAME OF MINE: COPPERVILLE

COUNTY: MOHAVE ^W
DISTRICT: CEDAR VALLEY
METALS: CU

OPERATOR AND ADDRESS:

MINE STATUS

DATE:

Mines Development ^{Inc.} Co.
M.B. Dudley,
Box 534, Kingman

DATE:

3/30/43 Accessibility loan granted
\$5000, \$9,500
3/1/44 Closed

W.B.M. - Bulletin 111

P. 52, 3, 4

MINES, DEVELOPMENT, INC.

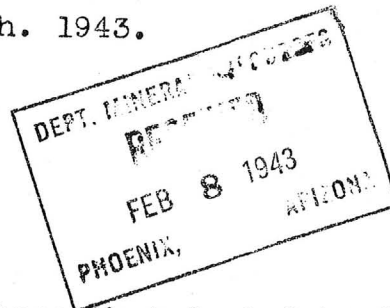
P. O. BOX 534

KINGMAN, ARIZONA

Feb 5th. 1943.

MINES IN
CEDAR VALLEY MINING DISTRICT
MOHAVE COUNTY, ARIZONA

Mr. J. S. Coupal.
Dept of Mineral Resources.
Phoenix, Arizona.



OFFICERS
M. B. DUDLEY
PRESIDENT
LEONARD HOFFMAN
VICE-PRESIDENT
J. H. HOFFMAN
SEC. & TREAS.

Dear Sam.,

Am pleased to announce that, last Saturday, we finished the dewatering and cleaning out of the Copperville property. Luckily we found the workings in excellent condition. The timbers in the shaft as well as in the drifts and cross-cuts were in perfect shape. That's sure one good break.

The boys got to work on the road immediately the storm ceased and, now have it in fair shape. It's no boulevard as you know.

Mr. Ralph Youtz, R.F.C. Engineer wires me that he will arrive here next Sunday, so we should now get some quick action.

Sorry I did not know the condition when I saw you in Phoenix. A wire sent me by Hoffman miscarried, so I thought they were still marooned. Anyway, everything is now O.K.

I am assured some action shortly from Washington on our new road which, will help a lot.

The Leviathan Metals Corp., owners of the Leviathan mine on which I hold the lease, held their annual stockholders meeting in office of E.S. Clark, Monday Feb 11th. Theo Hollister, was re-elected president. He is a prominent mining man and attorney of Duluth, Minn. The stockholders were well represented by a big majority. I attended the meeting. Wish you would give this information to Charlie. I meant to call on him but neglected it.

With all good wishes.

Sincerely yours.

M B Dudley
M. B. Dudley.

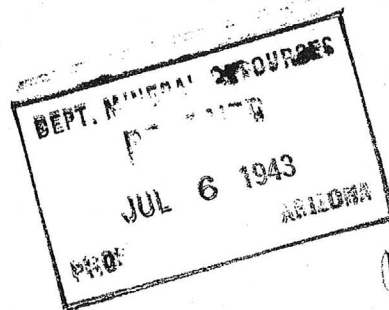
M. B. DUDLEY
LESSEE AND GENERAL MANAGER

PROPERTIES IN
CEDAR VALLEY MINING DISTRICT
MOHAVE COUNTY, ARIZONA

THE
LEVIATHAN MOLYBDENUM
MINE

P. O. BOX 534
KINGMAN, ARIZONA

July 5th. 1943.



Mr. J. S. Coupal.
Dept of Mineral Resources.
Phoenix, Arizona.

Dear Sam.,

I have neglected replying to your letter of June 26th regarding our pump at Copperville, until, I could say something definitely.

I find that it will not be possible for us to move this equipment, due to the fact that we are shortly to start dewatering between the 200 and 400 levels and, before this can be done, we will have to install additional pipe and plungers. The pump, as we bought it, was equipped to go only 220 feet, as the 200 level was the point we were interested in sampling. However, with the additional pipe and plungers, it will serve our ultimate purposes.

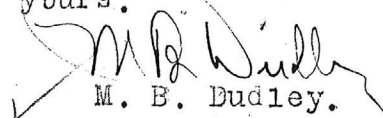
Sorry something could not have been worked out to assist in the other matter.

Was shocked to learn of Billy Grahams sudden passing. Did not know of it until Saturday evening.

Will be in Phoenix soon and see you.

With best wishes.

Sincerely yours.


M. B. Dudley.

February 8, 1943

Mr. M. B. Dudley
P. O. Box 534
Kingman, Arizona

Dear M. B.:

Thank you for your letter of February 5. I am glad to know that the RFC engineer will be in shortly and hope you are able to get the additional loan to put the Copperville in operation.

I will give your message to Charlie Willis and call it to his attention.

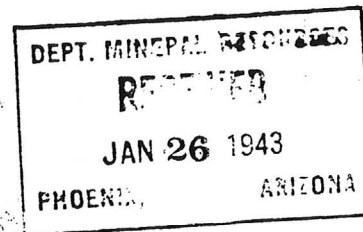
With best wishes and kindest regards, I am

Very truly yours,

J. S. Coupal
Director

JSC:kk

January 21, 1943



Progress Report,
Copperville,
Mines Development, Inc.,
M. B. Dudley, Pres.
\$5,000 RFC Loan.

MEMORANDUM

To: Earl F. Hastings

From: Elgin B. Holt.

Dudley says that shaft will be unwatered down to and including the 200-foot level within the next few days; that said shaft is now unwatered to 10 feet above said level; and that he is keeping Mr. Gohring advised as to progress, etc.

E.B.H.

Elgin B. Holt.

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
OWNERS MINE REPORT

Date July 25, 1940

Mine Siamese Group

Mining District & County Cedar Valley - Location Yucca, Arizona
Mohave county

Former Name

Owner W. L. Hoffman

Address (Owner) Enterprise, Kansas

Operator Not in operation now

Address (Operator)

President

Gen. Mgr.

Mine Supt.

Mill Supt.

Principal Metals Silver, gold, lead,
copper and zinc

Men Employed

Production Rate

Mill: Type & Cap.

Power: Amt. & Type

Operations: Present No

Operations Planned: Rehabilitate by re-equipping mine with diesel power and electricity and oil floatation to present mill equipment, in other words, to rebuild the entire structure!

Number Claims, Title, etc.: Nine patented claims, seven on the out crop of the covering a distance of ten thousand five hundred feet in length and two side claims. Others can be located.

Description: Topography & Geography: The property is located on the east slope of the Wallapai Range of mountains, 25 miles east of Yucca, about 5 miles below the divide between Yucca and the mine, which is in the foothills of the main range at an elevation of about 5000 feet.

Mine Workings: Amt. & Condition: Mine workings consist of one shaft 5'x9' 305 feet in depth; one shaft 5'x15' three compartment 400 feet in depth, the two shafts are connected with a drift on the vein 1536 feet in length. On the 200 foot level at the main working shaft and at the bottom of the smaller shaft which is to the north of the main shaft. For further details see Mr. Carl Anderson's report which we attach to this report.

(over)

Geology & Mineralization: As to the geology and mineralization we refer to Carl Anderson's report on the property.

Ore: Positive & Probable, Ore Dumps, Tailings: There is no tailings dump as the mill was not operated very long, as it did not save the values. No ore on dump to speak of, as the ore is left in stope of the mine as is described in Mr. Anderson's report.

Vein Width, Length, Value, etc: Main ore shoot is 350 long from 15 to 30 feet wide.

Mine, Mill Equipment & Flow Sheet: See Mr. Anderson's report.

Road Conditions, Route: Road was in good condition, but there was no work done on it for years, but it can again be made a good road at comparatively small outlay of money. (County will do most of the work.

Water Supply: Ample water supply can be developed at very small cost. At present there is ample water for any size plant desired.

Brief History: This property was started in the summer of 1917 and a great deal of work was done up to 1917 until this country entered the World War. The mill was a failure; had there been a floatation mill no doubt the property would be in operations, as conditions are right for the development of a large producing mine. With proper development it will make one of Arizona's big producers.

Special Problems, Reports Filed: To make a success it will take an up-to-date floatation mill. The ore is there.

Remarks: Some of the equipment that was on the property can be used if desired. Will be pleased to take anyone interested in a large property to the property and enter into a definite understanding.

If property for sale: Price, terms and address to negotiate: The property is for sale or a long term lease on a 10% royalty basis will be given. Price can be arranged to suit. It can be paid out of royalty payments.

SIGNED: Leonard Hoffman or J. H. Hoffman
P. O. Box 534, Kingman, Arizona

DESCRIPTIVE REPORT ON THE SIAMESE GROUP
OF CLAIMS AND EQUIPMENT

CARL ANDERSON, MINING AND METALLURGICAL
ENGINEER

2-1915

LOCATION AND GENERAL DESCRIPTION:

The property is located on the east slope of the Hualapai Range of Mountains, in the Cedar Valley Mining District, Mojave County, Arizona.

The property is reached by a 25 mile wagon road from Yucca, a station on the main line of the AT&SF Railroad. The road, which was constructed by the company at considerable expense, crosses the range at an elevation of about 5200 feet, with an average grade of 10 per cent over the mountain, and 5 ton loads are hauled from Yucca, elevation 1,840 feet, to the camp in six to eight hours, making comparatively cheap transportation.

The elevation at the mine is around 4,500 feet, giving an ideal climate for all year round work.

Except in a few small basins there is no timber on the range, but crude oil can be laid down at the mine at a reasonable price, giving cheaper and better power than wood under the best conditions. The mine requires but little timbering. The water supply is abundant.

THE MINING DISTRICT:

While practically no mining has been done the west slope of the range, the east slope is one continuous mineral belt for the entire length of the range, a distance of about 30 miles, and continues south to the MacCracken Mountains. The company's mines are in the center of this belt. The district presented considerable activity in earlier days in places where special geological and mineralogical conditions had caused a surface concentration in the silver values and when silver was high. In general, however, the veins are all very much alike.

The general character is a vein filling of quartz carrying gold, silver, lead, copper, zinc and iron, the difference being in the predominance of one of the metals in the different mines.

The inaccessibility of the district, scarcity of wood for fuel, and want of proper metallurgical process has kept this district back, but now with the advent of motor trucks, the development of the California oil fields, and improved methods of concentrating by oil flotation and separation, the transportation, fuel and treatment problems have been solved. The district should become one of the foremost mining centers of the United States, as all interests are now tending to the exploitation of large permanent propositions rather than the temporary mining.

PROPERTY:

The mining property consists of nine patented claims, a total of about 176 acres. Of these claims the five "Siamese" claims and two "Pittsburgh" claims are located on one vein, the other two claims being located on spurs which belong to the same vein system.

GEOLOGY:

The range is built up of coarse textured granitic rocks of volcanic origin of a comparatively late period, probably post Cretaceous.

* It exhibits all the usual characteristics of an intruded granite. No district folding was observed and possibly none exists. It shows in numerous places the action of magmatic segregation of separate bands of hornblende, feldspar and quartz. This

segregation took place while cooling, the segregated sheet showing the flow lines.

Other features are in the occurrence of barren glassy quartz veins, due to infiltration, filling shrinkage cracks. The granite is sheeted, the joining planes are mostly well apart, so that it weathers to large round boulders. The only other alteration observed, due to hydro-thermal action in connection with the vein filling, is not noticeable on the surface, and evidently does not extend but a short distance from the veins. The granite is of light colored acid variety, consisting mainly of quartz and pink orthoclase.

Of far less extent, but of greater importance, are the intruded dikes cutting through the granite. One in particular was examined. It crosses the north end of Side-line claim from the north and east, and near the north and center of Siamose No. 2 turns south and east, varying in width from 20 to 150 feet. It is along this contact that the vein is formed.

The diorite, when altered, is a hard, black, fine crystalline basic rock, which on weathering, softens and has a dark green tint due to the hornblende which predominates. It shows no grading into, or transition form away from the vein, but underground in the vein the two rocks, both altered, in places grade into each other. After cooling, due to the strain formed in cooling, a fault fissure was formed, which gave bent to the mineral bearing thermal springs that followed volcanic eruptions.

The hard granite hanging wall shows by striation and slickensides the movement between the hard rocks to be at an angle of 45 degrees from the horizontal.

The fissure, in the main, followed the contact. In places it cut through the granite close to the diorite and again through the diorite close to the granite.

The vein was gradually built up. Each period of hydrothermal action enlarged and enriched the vein. Cross-cut No. 4 on the hanging wall shows the structure of the ore to be symmetrical crusts, deposited in definite order as banded vein filling. That the vein was further faulted after forming is shown, for example, in the cut to the foot wall above cross-cut No. 7 where sharp cornered pieces of quartz from the vein are found in the gouge or attrition clay formed by movements along the wall. Many other features were observed, but are beyond the scope of this report.

The vein formation representative different periods, the character of the ore deposited probably also changed somewhat, so that the silver, lead and zinc represents one or several periods of deposition; the copper and gold probably other, though of course considerable intermingling took place; the copper replacing the iron as a secondary mineral. The mineral bearing waters being acid (silicious) naturally effected the basic diorite far more than the acid granite, on which it would have but little effect. The vein filling was then formed by metasomatic replacement of the diorite.

In parts, this replacement has been absolute, forming large bodies of mineralized quartz. This forms the main ore bodies. In places the diorite has only been partly replaced, making a silicified diorite well mineralized, of lower grade, but of milling value; and again the diorite can be found unaltered only showing quartz seams through out it; this occurs sparsely as "horses" in the vein.

As stated, the alteration of the granite has been but slight. In cross-cut No. 12, where the fault fissure cuts partly through the granite, the cracks between the crushed rocks have been filled with solid galena and zinc blend, testifying to the richness of the mineral bearing solutions. These seams which show, as a fine network through the entire granite mass within the vein, are places several inches wide making a good milling ore. In the main drift, where it crosses the vein from foot wall to hanging wall, the magmatic segregation of the granite can be observed.

THE VEIN AND ORE SHOOTS:

The principal vein, and the only one exploited to any extent, is covered by seven patented claims, a total of 10,500 feet on the vein. It can be followed the entire distance by its outcrop, and where developed has been found to correspond to the showing underground.

The ore bodies have strong prominent outcrops forming the crest of the hill due to the massive quartz having protected the softer country rock from erosion.

Four separate ore shoots are proven, No. 1 about 200 feet long, from 4 to 8 feet wide, developed by main drift to a depth of 300 to 400 feet. In the south end of Siamese No. 1 north of shaft No. 1, No. 2 about 300 feet long, from 8 to 14 feet wide, developed by main drift to a depth of from 130 to 200 feet. In the center of Siamese No. 2, No. 4, from surface showing is about 400 feet long, and from 15 to 30 feet wide, developed by tunnel No. 2 for about 200 feet. It is on the south end of Siamese No. 3 and north end of Siamese No. 4. This would make, then, after deduction, 50 feet of almost entirely leached surface ore, a total of about 2,000,000 cubic feet or 150,000 tons of ore above present workings, which, with adequate mining and milling facilities, can be worked at a profit. Each additional 100 feet in depth would aggregate for the four ore shoots about 125,000 tons of ore.

The impoverishing of the vein through leaching by acid surface waters has been great. The oxidation of the pyrites caused the formation of sulphuric acid, which disclosed the copper, which probably already had been altered to oxides and carbonates. This leaching is still going on, as can be seen in tunnel No. 1 where crystalline tufts of chalcantite, or native sulphate of copper are still forming. THE EFFECT ON ZINC AND LEAD SULPHIDES HAS BEEN LESS, SO THESE ARE THE PREDOMINANT MINERALS IN THE MINE AT PRESENT DEPTH. There is, then, good reason to expect a material increase in copper values at permanent water level. Where found unaltered in the solid quartz the mineral gave by analysis 28.4% copper and 36.4% iron corresponding to bornite with a small per cent of pyrite. In Butte, Montana the large copper deposits are the results of leaching and re-precipitation of large bodies of vein matter carrying 1% and less in copper. The formation of sesquioxide of iron, a solvent of gold (Report United States Geological Survey) may equally have effected the gold values. Indications from copper stained decomposed vein matter are that the copper will favor the foot wall side of the vein.

WATER LEVEL:

From the comparative rapid decrease of oxidized ore, from the surface to the main shaft, a distance of 200 feet at shaft No. 2, there is reason to expect the permanent water level in a short distance, probably another 400 feet will reach it.

MAINE DEVELOPMENT:

The main development work has been done on the Siamese No. 1, 2 and 3. On Siamese No. 1 a double compartment shaft 5x9 feet was sunk to a depth of 305 feet. At 285 feet drifts were driven north and south on the vein to the north, a distance of 600 feet, attaining a depth of 470 feet. Tunnel No. 1 was run a distance of 200 feet on the ledge intersecting the shaft at a depth of 80 feet and continues beyond the shaft for about 500 feet. From the station on the 285 foot level a drift south was driven about 950 feet following most of the distance the hanging wall. Between cross-cut 13 and 12 the drift cuts from the hanging wall to the foot wall.

* Shaft No. 2, a 5x15 feet, 3 compartment, vertical shaft, was started on the hanging wall side of the vein, crosses the vein, and the bottom at 222 feet is in the foot wall. At a depth of 205 feet a drift was driven north, connecting with the south drift from shaft No. 1, making 1536 feet on the vein between shafts with 17 cross-cuts from 10 to 40 feet in length. The drift south from shaft No. 2 is 224 feet, making 2,360 feet continuous on the vein.

Tunnel No. 2 on Slaneese No. 3 and 4 is about 500 feet long, 200 feet being driven on the foot wall side, of a well mineralized ore shoot, No. 4 attaining a depth of 220 feet. This tunnel is about 100 feet higher than the collar of shaft No. 2 and the mouth of the tunnel is about 1,000 feet south of the shaft.

Besides these workings there are numerous cuts, shallow shafts, etc., making a total of more than one mile of underground work. As can be seen from this description, only ore shoots No. 2 and 3 can be worked at present to advantage from shaft No. 2. From shoot No. 1 it would be over 1,500 feet upgrade traming, which is impractical. From shoot No. 4 there is no connection with the shaft.

At the 200-foot station of this shaft is a 16 x 16 x 10 feet sump for collection of mine water, into which flows the water pumped from the sump at shaft No. 1.

MINE EQUIPMENT:

Shaft No. 1 is equipped with a 12 H.P. Western Gasoline Hoist, cable and bucket, and a Luitweiler pump driven by a gasoline engine. At the 285-foot station is a Typhon pump driven by a 3 H.P. D.C. Motor, which pumps the water to the sump at shaft No. 2.

Shaft No. 2 is equipped with a steel gallows frame and two steel cages. The Hoist room is equipped with a Dillon-Box 82 H.P. double drum hoist driven by an 82 H.P. induction motor. It also contains an Ingersoll-Rand 17" x 10" x 14 air compressor driven by a 100 H.P. induction motor. At 200-foot station is a Luitweiler pump driven by a 5 H.P. D.C. Motor which lifts the water to the storage tanks above the mill.

There are five galvanized iron tanks with a combined capacity of 42,000 gallons. In addition the tailings and water is held in the gulch below the mill by a concrete dam, but considerable of the water escapes here. About one-half mile above the camp is a reservoir holding approximately 75,000 gallons.

THE ORE AND ITS VALUE:

The ore as referred to in several places in this report is a white crystalline quartz carrying gold, silver, copper, lead, zinc and iron. Small amounts of antimony and arsenic is found by analysis, and as much as 4/10ths per cent of bismuth in the concentrates.

The principal minerals are galena, carrying silver, zinc, blende, bornite (copper-iron-sulphide) and pyrites. The minerals are within zones fairly evenly distributed throughout the quartz, and while streaks and bunches of solid mineral are encountered, the ore does not occur in a way to make the sorting out of shipping ore practical. It is strictly a concentrating ore. No barite (heavy spar) is found, so a product clean from gangue material can be obtained. The different minerals have intergrown which led to the erroneous idea that fine crushing was necessary, but as the crystallization is fairly coarse, the minerals separate readily along the crystal faces.

In metal values, silver is first, next lead, then zinc, copper and gold. The possibility of copper predominating in depth has been referred to.

It can be readily seen that in a vein of this size and genesis the value of the ore depends entirely upon with what selection the ore is mined, and this selection again depends upon physical conditions in the mine, capacity of mill, etc. The assay records give numerous and various values for samples taken from different parts of the mine. To obtain as representative a sample as possible, samples were taken at regular intervals in the mill for five days during the examination. The mill was running one 8-hour shift per day, no more water being available, so the sample represents approximately 200 tons milled. As the ore was drawn by chutes from the stopes in the mine, and there are several thousand tons broken in the stopes, the sample may be considered to represent this tonnage. The average of the assays and analysis gave gold 0.01,

silver, 5.01 ounces; lead, 2.6 per cent; copper, 0.25 per cent; zinc, 4.3 per cent. The total metal value at present market prices would be \$10.54. Based on the price paid by the smelters, which is 55¢ per ounce for silver, 3¼¢ for lead, 3½¢ for zinc, and 10¢ per pound for copper. The ore has a value of \$8.15 per ton. To obtain these prices a fairly clean separation of the zinc from the other metals must be made, but this the mill should and can do. The silver is almost entirely combined with the lead at the ratio of two ounces of silver to each per cent of lead. That high grade concentrates can be readily made was demonstrated by cutting out samples from the tables while operating. Assays gave gold 0.30 ounces, silver 123.2 ounces, lead 50.8 per cent having a value of \$112.63 on above metal valuation.

The mill is yet in an experimental stage. The classification is far from perfect, so that the subsequent separation on the tables is very unsatisfactory. For this reason two products are now being made; one a shipping product, carrying 60 ounces silver, 30 per cent lead, value \$52.50, and a mixed product of lead, zinc and copper, which is being stored. A high per cent of saving on this ore should be made, 85 per cent or better. One of the great difficulties is the sliming of the minerals due to fine grinding.

Tests show that 70 per cent of the values of the ore was in the fine pulp if finer than 100 mesh. Crushing to 1mm or 20 mesh is ample, as it gives a perfect separation of gangue and mineral. The mill, with the exception of the Harding mill, has a capacity of 350 tons per day.

MILL EQUIPMENT:

The mill building is a steel frame constructure covered with corrugated galvanized iron, 50 x 120 feet, cement floors and fire proof throughout.

The ore, as delivered by car direct from the mine, is dumped in the grizzlie which has a 1½ inch opening; the oversize drops in a "D" Gates Crusher, driven by a 25 H.P. motor where it is crushed to about 1½ inch size. Both products from crusher and grizzlie are discharged on to a shaking screen with 10 mm. holes, the fines going to one bin, the oversize to another. Each of these bins have a capacity of 300 tons and are built of reinforced concrete.

The ore from the oversize bin is by scraper conveyor taken to a 24 inch Symons Disc Crusher, where it is broken to about ½ inch mesh, a shaking screen with 4 mm openings, carries the oversize to an 8 foot Harding's Pebble mill.

The fine ore from the other bin is by scraper conveyor fed on a 4 mesh screen, the oversize going to the Pebble mill; the undersize, together with the undersize from the Disc Crusher, is by shaking launder carried to an Overstrom Classifier where it mixes with the product from the Pebble Mill. Conveyors and shaking launders are driven by a 50 H.P. A.C. Motor. From the classifier the different results are distributed to the concentrating tables, which are the Overstrom pattern, 14 in all.

The slimes are devided between two slime tables. From the five following columns the material goes to five sand tables, and the last and coarsest material from the emergency column to two roughing tables. The Middlings from these two tables are by an elevator returned to the Pebble mill for regrinding. From the other tables four products are at present obtained.

No. 1, high silver and lead, which is being shipped. No. 2 carrying a small per cent of silver and lead, with copper, zinc and iron, which is being run into storage bins for future treatments. No. 3, middlings, which by elevator is taken to Classifier No. 2. No. 4, tailings which are run into the tailing pond for the recovery of the water if necessary.

In classifier No. 2, similar to No. 1, the midlings are again classified into five sizes and distributed over five more tables where the division of the products is the same as above. At the lower end of the mill are four concrete storage tanks, 14' x 12' x 3½', each capable of holding 20 tons of concentrates. Part of these tanks are now being used for water storage and settling. The water from the tailing pond is returned to these tanks by a 4 inch centrifugal pump driven by a 25 H.P. motor. From here it flows to another 4 inch pump which raises it into the mill. The tables, elevators and mill pumps are driven by a 25 H.P. motor.

POWER PLANT:

The power plant is housed in a steel structure covered with corrugated galvanized iron and cement floor. The power is furnished by two 150 H.P. Meitz and Weiss Oil engines, directly connected to two 100 K.H.A3 cycle generators.

The plant includes a 10 K.W.D.C. generator and transformer. The mine, mill and camp are lighted by electricity. Crude oil is used for fuel and at 4½ cents a gallon delivered at the mine, represents less than 1/2 cent per H.P. hour.

Other equipment consists of machine shop with lathe and drill press, driven by a 10 H.P. motor; a blacksmith shop with a Leyner drill sharpener worked by compressed air, assay office and chemical laboratory complete, survey instruments, etc., frame office building, tent bunk and cook house. The Company owns three 6-ton Sauer motor trucks for hauling supplies and concentrates.

RECOMMENDATIONS:

No time should be lost in placing the property on a dividend paying basis. Shaft No. 2 should be sunk another 200 feet, preferably deeper, and levels driven north each 100 feet to develop ore shoots No. 2 and 3. At the 400 foot station the drift should also be driven south to exploit ore shoot No. 4. At this depth the drift would be five hundred feet below tunnel No. 2 and 700 feet below the apex of the vein. As far as surface showings, No. 4 ore shoot gives better promise than No. 1 and 2. and equals No. 3, the replacement of the diorite having been complete. On the main drift in shoot No. 3, it should be, in a crosscut or two, ascertained if the diorite showing is the hanging wall, is the true wall. Shoot No. 2 could be further exploited to advantage in crosscut No. 12 by a raise on account of the rich seams in the granite. It is paramount that the shaft be sunk, not only for the increase in water supply, which undoubtedly will be heavy considering the increase for the distance sunk, but it would require two or three working levels to handle the tonnage on single track and extract the ore at minimum cost.

In the mill, all the material from crusher and grizzlies of a size equal to the product of the disc grinder should at once be screened out. This would relieve considerably. From the disc grinder the ore, to prevent sliming, should be further reduced by rolls, any standard make, to not finer than 10 mesh, and the returned midlings not finer than 20 mesh. This will insure complete separation of gangue and minerals without sliming. By this coarse grinding, the product being all of a more size, better results will undoubtedly be gotten by the classifier. This will enable the tables to perform better work, and a higher grade and better amount of concentrates will result.

CONCLUSION:

You have a valuable mining proposition. The extent of the vein on the surface gives assurance of permanency in depth. The development work has shown large defined ore bodies and the work has been done in a workmanlike manner. The surface equipment is first class and up-to-date.

Respectfully submitted,

Signed

Carl Anderson, M.&Met. E.
Member Am. Inst. of E.M.
Member North of Engl. Inst.
of M. and Mech. Engineering

Since the above report was made by Mr. Anderson, shaft No. 2 has been sunk to the 400-foot level, a station cut at the 400-foot level, and a drift run to the north about 177 feet, in the foot wall, (not on the ledge). At this point a crosscut was started and from every indication the face of crosscut is near the ore shoot, No. 3 opened up above on the two hundred foot level.

Signed J. H. Hoffman

LIST OF MACHINERY & EQUIPMENT NOW AT
COPPERVILLE

May 23, 1940

- 1 - Ingersoll-Rand Type No. 10 Compressor 17 x 14 -- 10 x 14
- 1 - Dillon - Box Double Drum Electric Hoist, 82 H.P. driven by an 82 H.P. Induction Motor. (with cable)
- 1 - Induction Motor G.E. 120 AM Volts 440 - 100 H.P.
- 1 - 1-50 foot steel Gallus frame
- 2 - Mine shaft cages
- 5 - Mine cars
- 6 - Large corrugated iron tanks
- 1 - Allis Chalmers Co., Gates Giratory Crusher "D"
- 1 - Hargind 8-foot Pebble Mill
- 1 - Wagner Mfg. Co. Motor 50 H.P. 440 volts 59 Am.
- 2 - Web- City Rolls 16 inch face
- 1 - 24 inch Symons Disc Crusher
- 2 - 150 H.P. Meitz and Weiss Hot Head Oil Engines, directly connected to two 100 K.W. A. 3 cycle Westinghouse generators.
- 1 - 1 10 K.W.D.C. Generator and transformer

Power equipment in bad shape

- 1 - 12 H.P. Wetsern Gasoline Hoist
- 1 - Electric Motor H.P.
- 1 - Milling Building 120 x 50 feet, all steel structure, concrete floors.
- 1 - Power House, Steel Structure, concrete floor.

The buildings were covered with galvanized iron, but most of it is stripped and taken off by thieves, as well as all other equipment is stolen except the above list of machinery and equipment which is still in place.

Intra-Company Correspondence

SHATTUCK DENN MINING CORPORATION
and
SUBSIDIARIES

Humboldt, ArizonaOffice

Date.....August 12, 1967

TO: Engineering Dept.
Humboldt

SUBJECT: COPPERVILLE MINE

FROM: Jack C. Pierce

Do we have any information on the subject in our files?

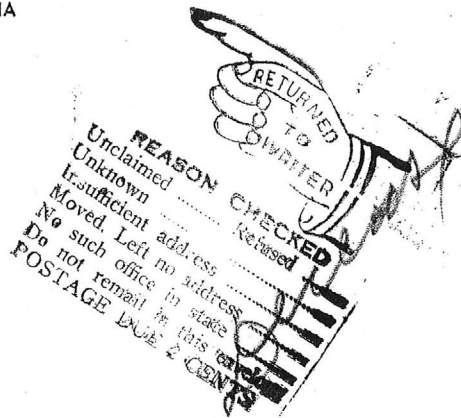
Please return the attached summary.

JCP/mj

*

RESOURCES

grounds
IA



Mr. Leonard Hoffman
Box 814
Kingman, Arizona

ARIZONA DEPARTMENT OF MINERAL RESOURCES
MINERAL BUILDING, FAIRGROUNDS
PHOENIX, ARIZONA

August 20, 1958

To the Owner or Operator of the Arizona Mining Property named below:

Siamese Group(Copperville)(Mohave County)	lead, zinc, copper, silver and
(Property)	(ore) gold

We have an old listing of the above property which we would like to have brought up to date.

Please fill out the enclosed Mine Owner's Report form with as complete detail as possible and attach copies of reports, maps, assay returns, shipment returns or other data which you have not sent us before and which might interest a prospective buyer in looking at the property.

Frank P. Knight

FRANK P. KNIGHT,
Director.

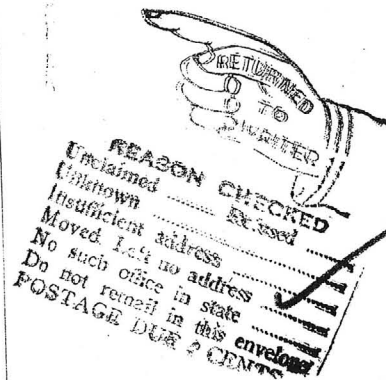
Enc: Mine Owner's Report

ERAL RESOURCES

Arizona

Fairgrounds

IZONA



Mr. M. B. Dudley
The Leviathan Molybdenum Mine
P.O. Box 534
Kingman, Arizona

ARIZONA DEPARTMENT OF MINERAL RESOURCES
MINERAL BUILDING, FAIRGROUNDS
PHOENIX, ARIZONA

August 27, 1958

To the Owner or Operator of the Arizona Mining Property named below:

Coperville (Mohave Co.)
(Property)

copper
(ore)

We have an old listing of the above property which we would like to have brought up to date.

Please fill out the enclosed Mine Owner's Report form with as complete detail as possible and attach copies of reports, maps, assay returns, shipment returns or other data which you have not sent us before and which might interest a prospective buyer in looking at the property.

Frank P. Knight

FRANK P. KNIGHT,
Director.

Enc: Mine Owner's Report

Hoffman

December 19, 1946

Mr. Leonard Hoffman
Box 814
Kingman, Arizona

Dear Mr. Hoffman:

Thank you for the reports submitted
on the Siamese Group.

We will be glad to refer these reports
to anyone interested in a property such as yours.

Yours very truly,

Chas. H. Dunning
Director

CHD:lp

SHATTUCK DENN MINING CORPORATION
and
SUBSIDIARIES

Humboldt Office

Date..... June 29, 1966

TO: C. R. Sundeen

SUBJECT: HOLLINGSWORTH PROPERTIES ✓

FROM: J. Olaf Sund

% E.L. Hollingsworth
P.O. Box 945
Wickieup, Arizona

TYPE: Lead-silver

TERMS REQUESTED:

Hollingsworth wishes to ship ore to the Iron King after a cash advance to get him started (?).

LOCATION:

The various properties held or located by Hollingsworth are mostly northwest, west and southwest of Wickieup. They are all old past producing mines and include such current names as Lucky Penny, Silver Dollar, Royal Blue, Luck Day, Hard Day, Gold King (formerly Spanish Arastra), and Copperville etc.

The two properties examined by the writer and considered as a representative cross-section are the Copperville and the Hard Day. The former is located along the common boundary of Ranges 14 and 15 West in Township 17 North. The latter is only approximately established but probably in Township 16 $\frac{1}{2}$ North and Range 14 West.

These two groups of claims are tied-onto two sides of a considerable parcel of ground that is currently held by Arkla Exploration Co. (Arkansas and Louisiana Gas Co.). An extensive diamond drill program is in progress for Arkla which is being done by Boyles Bros.

GENERAL GEOLOGY:

The entire area to the west of Wickieup is underlain by a variety of granitic rocks that make up the Hualapai Mountain Range. These include distinctly intrusive granites of Precambrian and Tertiary (?) age as well as a very widespread granite gneiss, also of Precambrian age. The latter gneisses are all greyish, medium-grained, quartz-feldspar-biotite types and are characterized by the normal foliation. Although the evidence was not clear, it is believed that they consist of both orthogneiss and the included paragneiss.

Quartz veins of varying sizes and orientations have intruded into the gneissic rocks along joints, faults or shears and in places the foliation. The quartz is generally a pure white glassy variety that frequently carries galena, some sphalerite and silver, some of which is in the free state.

Mar 29, 1966

Page 2

PROPERTY GEOLOGY:

These quartz veins have been the subject of considerable mining efforts, most of which probably date around the 1900's. It is on these old mines that Hollingsworth has located claims. He now wishes to ship the rock from the numerous mine dumps to the Iron King.

Re: Copperville property. Two shafts with dumps that should contain approximately 90,000 tons of rock combined as well as two adits with smaller dumps all intersected and mined along a 5 foot wide sheared zone that contained irregularly mineralized quartz veins. The orientation at this property is north 40 degrees west and the dip is vertical.

The following samples were collected from the mine dumps and assayed:

Sample No.	Description & Location	Au	Ag	Pb	Zn	Cu
12385	x-sect.1, top 12 ft. (1st Dump)	0.03	0.5	0.6	0.7	0.08
12386	" Mid 12 ft	Tr	0.3	0.2	0.3	0.08
12387	" bottom 12 ft.	0.02	0.3	0.22	0.4	0.07
12388	x-sect.2 top 12 ft.	Tr	2.5	1.0	3.6	0.12
12389	" mid 12 ft.	Tr	2.0	1.6	3.3	0.12
12390	" bottom 12 ft.	Tr	0.3	0.2	1.2	0.08
12391	x-sect.3 top 12 ft.	0.02	0.4	0.2	0.1	0.07
12392	" mid 12 ft.	Tr	0.3	0.2	0.9	0.08
12393	" bottom 12 ft.	Tr	0.7	0.3	0.5	0.14
12394	x-sect.4 top 12 ft.	Tr	0.01	0.7	Tr	0.06
12395	" bottom 12 ft.	Tr	Tr	Tr	Nil	0.02
12396	selected quartz-top of dump	Tr	1.7	0.80	1.3	0.05
12397	" " " " "	Tr	2.6	1.6	1.5	0.22
12398	concentrates: middle bin	0.04	21.3	11.4	16.9	0.94
12399	" south bin	0.05	8.0	3.2	22.5	1.60
12400	" north bin	Tr	7.9	3.0	23.4	1.7
12851	face: mid adit: 2 ft. quartz	Tr	4.8	2.5	0.3	0.5
12852	" " " 2 ft. quartz	Tr	2.4	4.6	0.3	0.12
12853	x-sect.1, top 12 ft. (2nd dump)	Tr	0.3	0.4	0.2	0.10
12854	" mid 12 ft.	0.01	1.4	2.2	1.5	0.7
12855	" bottom 12 ft.	Tr	0.5	0.5	0.4	0.12
12856	x-sect.2, top 12 ft.	Tr	0.3	0.3	0.4	0.06
12857	" Mid 12 ft.	Nil	0.3	0.30	0.60	0.10
12858	" bottom 12 ft.	0.02	Tr	0.20	0.60	0.10
12859	x-sect.3, top 12 ft.	Tr	Tr	Nil	Tr	0.06
12860	" bottom 12 ft.	Tr	Tr	Nil	Nil	0.06

Re: Hard Day property. This is apparently fairly typical of the many other properties, of which Hollingsworth has control. A modest effort to mine the above quartz veins has resulted in only a limited quantity of rock on the dumps. The orientation of the vein here is at north 5 degrees west and has an 80 degree easterly dip. The vein is 2 to 5 feet wide and contains some galena chalcopryrite and silver. The host is massive granite. Other parallel veins some 100 feet away are 12 to 18 inches wide and are probably moderately mineralized although they were not opened up.

Samples collected were assayed as follows:

Sample No.	Description & Location	Au	Ag	Pb	Zn	Cu
12861	Qtz from dump with lead & copper	0.06	6.8	1.1	0.1	0.22
12862	" " " " " " " }					
12863	" " " " " " " }	0.08	6.8	1.2	0.6	0.24
12864	2nd vein-quartz #1	0.05	4.0	0.1	Nil	0.12
12865	" quartz on strike	Tr	Tr	0.6	0.10	0.12
12866	" " " "	0.05	3.8	0.2	0.01	0.20
12867	" " " "	0.02	17.6	0.6	Nil	0.58
12868	" " " "	Tr	3.1	0.2	Nil	0.28

SUMMARY:

It is immediately apparent from the assays of samples taken on the main dump at the Copperville property that the overall grade is not significantly high. In fact, the crude average grade for the 90,000 tons of rock would be only \$3.40 per ton on the basis of the above sampling. Even the limited collections of selected "high-grade" rocks only averaged \$5.60 per ton.

Samples from the dump of the Hard Day property indicate an average grade of \$10.98. However, such higher grade rock is very limited. Hollingsworth has pointed out that most of his other properties have the same limited quantity of rock in the dumps.

Special note should be made to the 3 samples taken from 3 separate bins of concentrates at the Copperville mine. There is probably about 10 tons of such material with an arithmetic average grade of \$46.10 per ton.

CONCLUSIONS:

The old Copperville mine together with the long list of properties owned by Hollingsworth are probably all geologically nearly identical. They are characterized by narrow discontinuous quartz veins that occupy shears and joints in a granitic gneiss. The veins may carry anomalously high silver with lead and zinc mineralization.

Mining such veins can be considered on only a small "high-grading" basis. Thus it is recommended that Shattuck Denn show no interest in an option on any of the many properties involved.

Custom milling the rock dumps from the ancient mining cannot be considered because of the general low grade involved. However, if only the higher grade parts of the various dumps were carefully selected, a \$10.00 rock might be possible. This would, of course, limit the actual tons available for milling. Henry Swanson has pointed out the difficulty in custom milling quartz rock with such a high silver content in that much can be quickly lost. Therefore, such a proposal of the limited scope involved does not appear to be feasible.

The approximate 10 tons of concentrates on the other hand carry high percentages of lead and zinc. If a reasonable price can be arranged this might be an opportunity for a limited but instant profit.

Hollingsworth's title to the Copperville property would have to be verified first. He does not appear to be the most dependable type of citizen.

Dump: 75'x40'x(0 to 130')

12859
12860

12856
12857
12858

12853
12854
12855

Distance approx
1500'

12851
12852

12394
12395

12391
12392
12393

12396
12397

12388
12389
12390

12385
12386
12387

Concentrates: 12398
12399
12400

Dump: 132'x84'x(0 to 100')

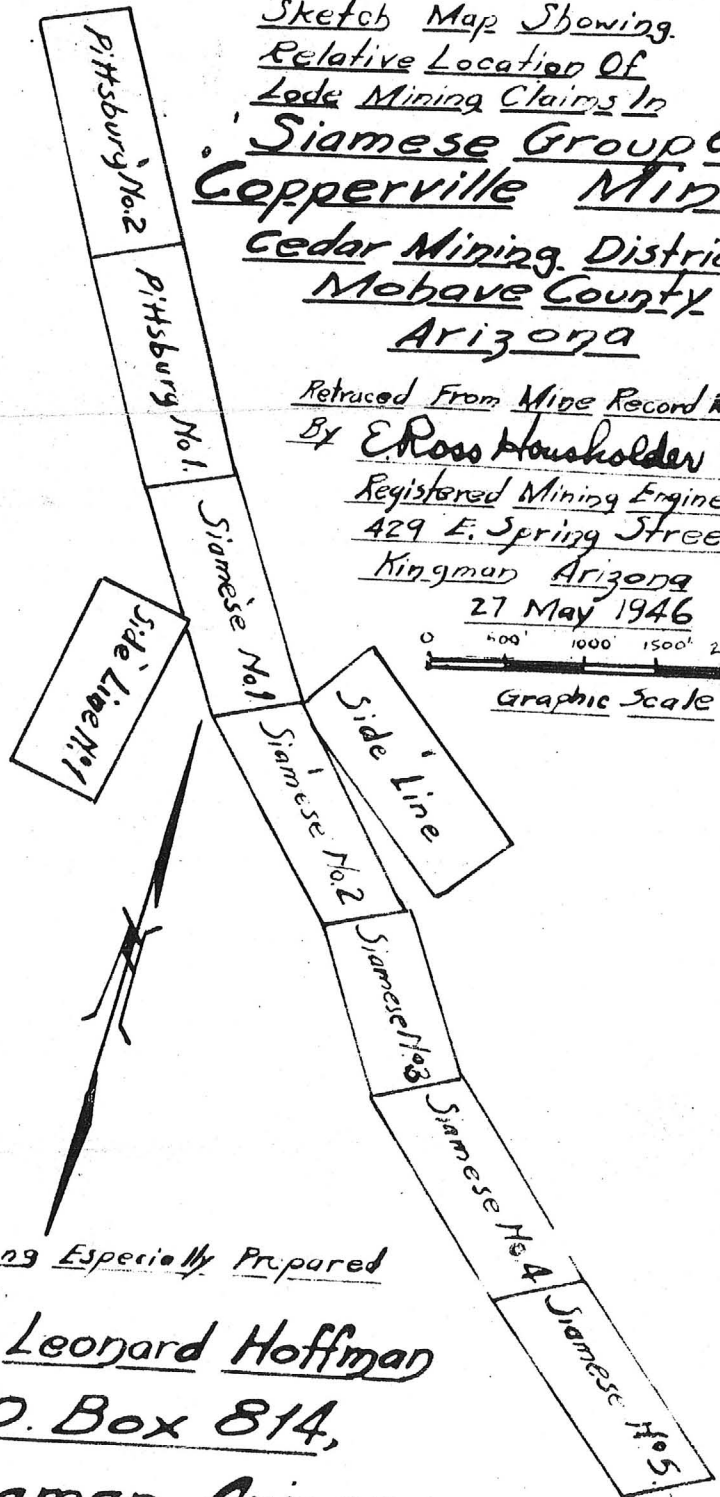
SAMPLE LOCATIONS FROM MINE DUMPS
COPPERVILLE PROP.

(HOLLINGSWORTH PROPERTY)

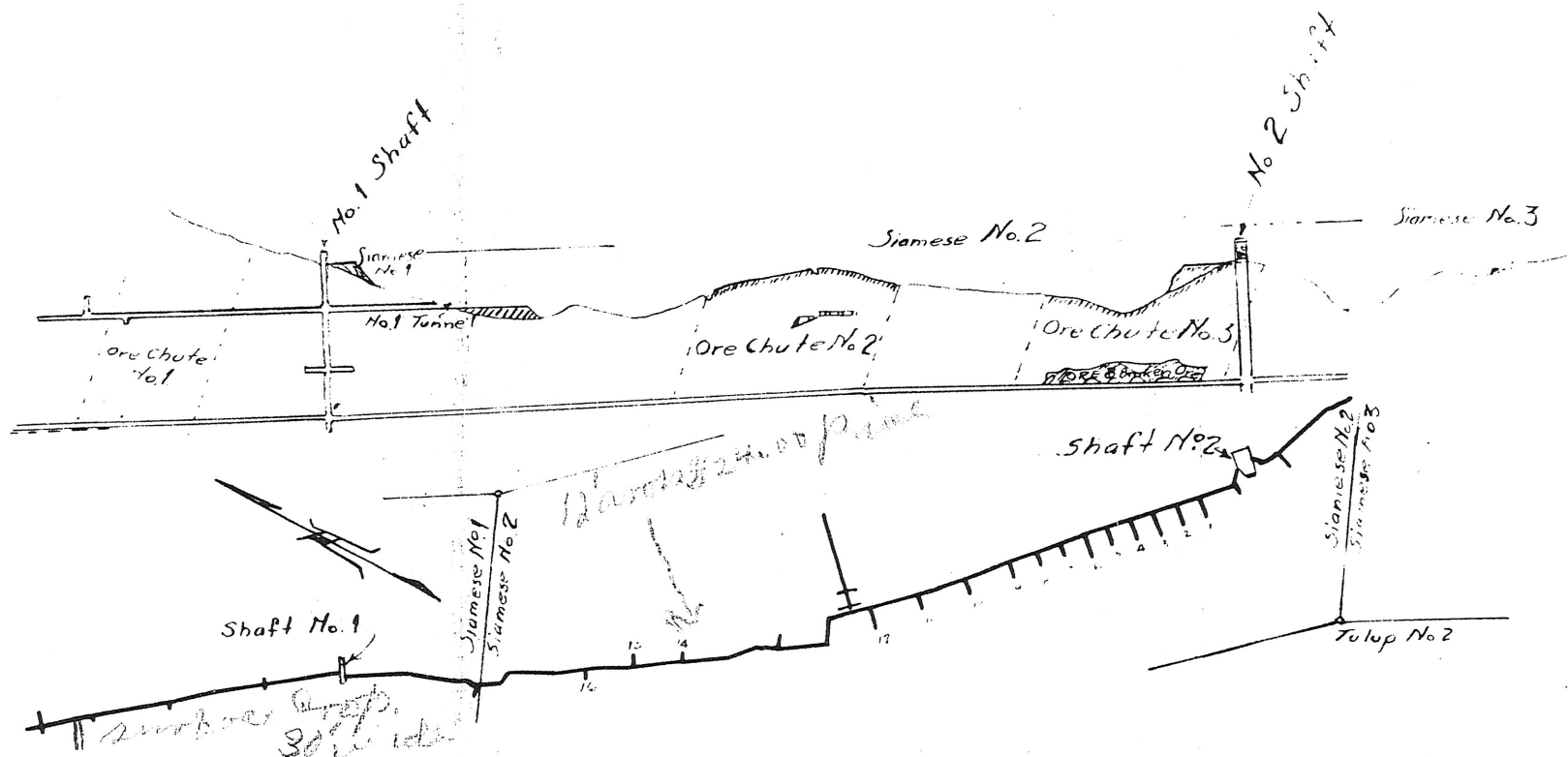
Sketch Map Showing
Relative Location Of
Lode Mining Claims In
Siamese Group Of
Copperville Mine
Cedar Mining District
Mohave County
Arizona

Retraced From Mine Record Map
By E. Ross Hausholder Em.
Registered Mining Engineer
429 E. Spring Street,
Kingman Arizona
27 May 1946

0 500 1000 1500 2000
Graphic Scale



Tracing Especially Prepared
For
Mr. Leonard Hoffman
P.O. Box 814,
Kingman, Arizona



Retraced From Mine Record Map
 By Ekoss Householder, E.M.
 Registered Mining Engineer
 429 E. Spring Street,
 Kingman, Arizona
 27 May 1946

0 100' 200' 300' 400' 500'
 Graphic Scale

Sketch Map Showing
 Elevation & Plan Of The
 Underground Workings

Of The
Copperville Mine
 Cedar Mining District
 Mohave County, Arizona

Tracing & Map Prepared
 For

Mr. Leonard Hoffman,
P.O. Box 814,
Kingman, Arizona

To Accompany Report By
 Carl Anderson, Mining & Met. Engineer

Sketch Map Showing
Relative Location Of
Lode Mining Claims In
Siamese Group Of
Coperville Mine
Cedar Mining District
Mohave County
Arizona

Retraced From Mine Record
Map By E. Ross Haushalter, Engr.

Registered Mining Engineer

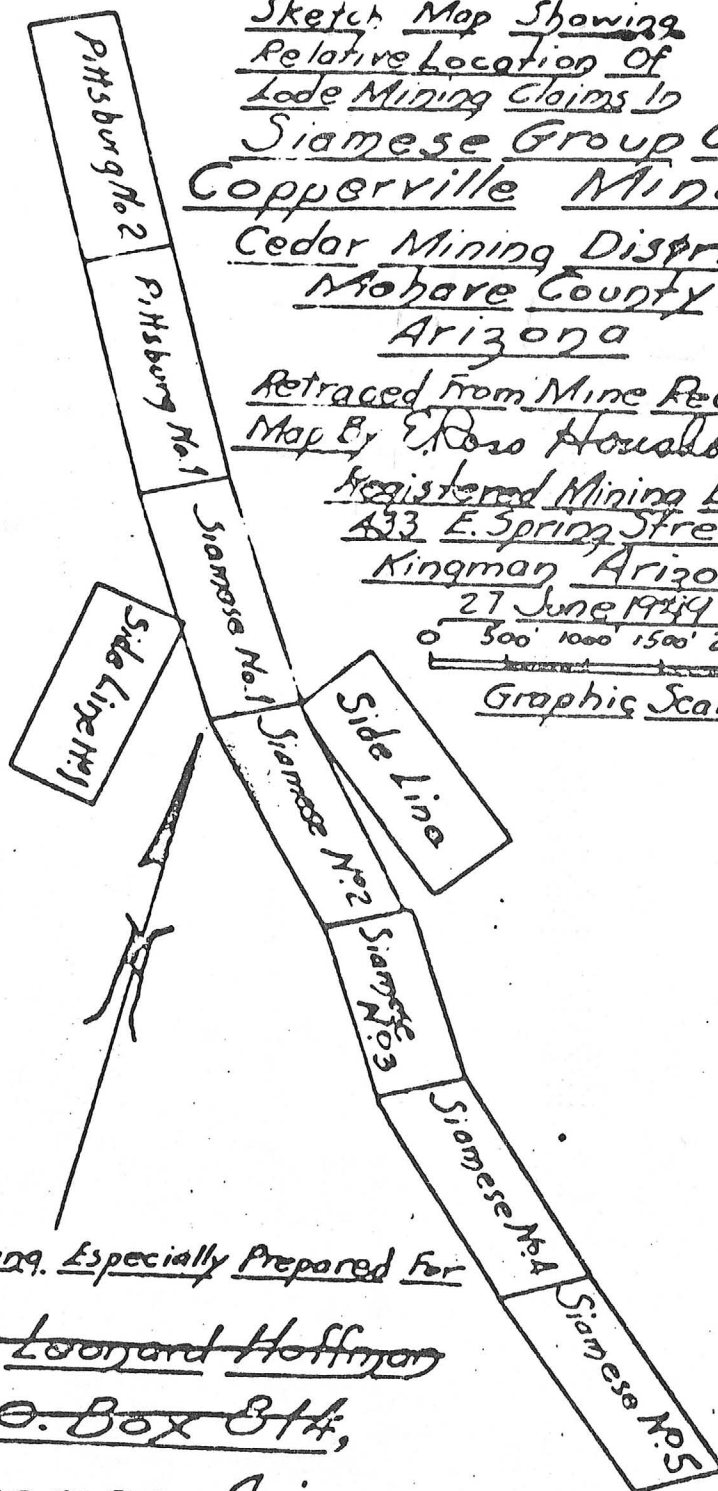
433 E. Spring Street

Kingman, Arizona

27 June 1944

0 500' 1000' 1500' 2000'

Graphic Scale

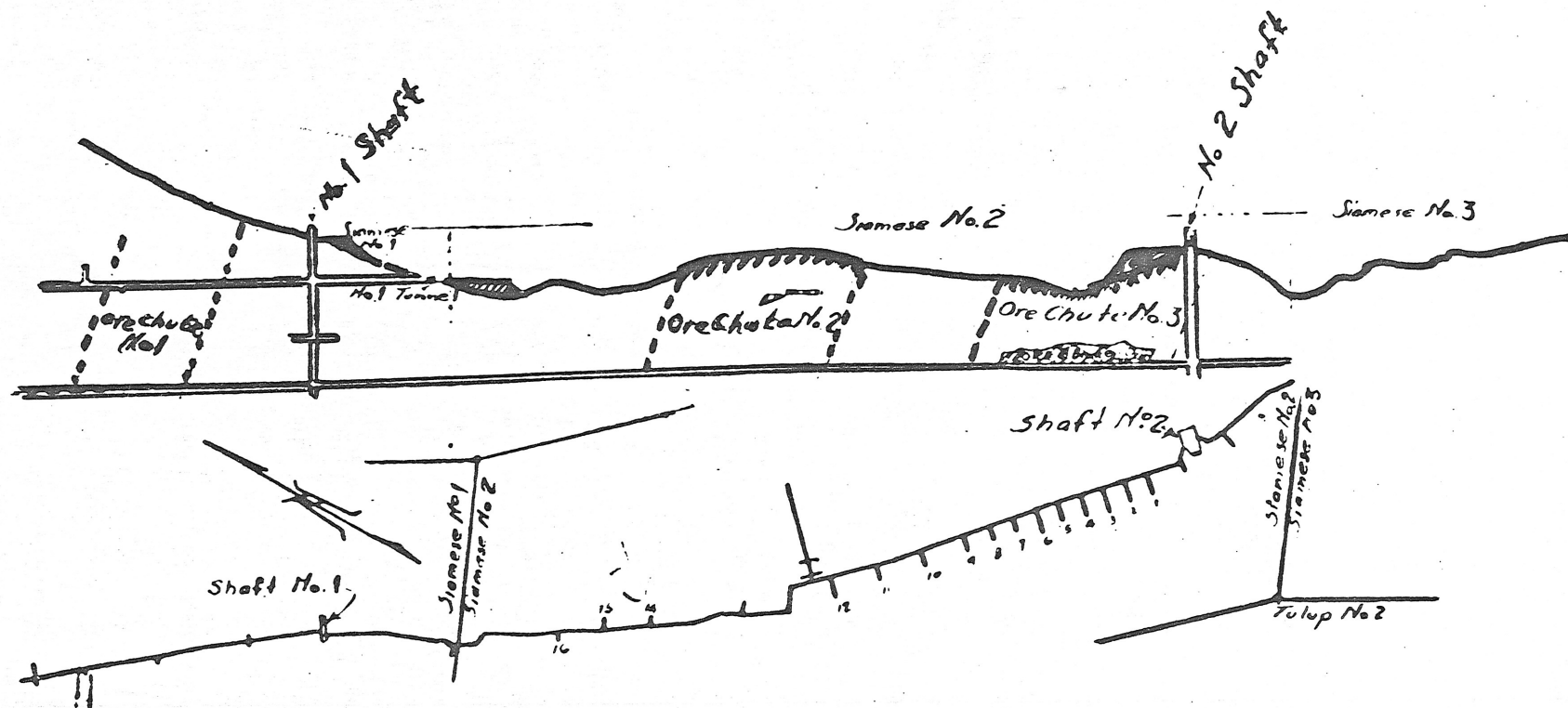


Tracing. Especially Prepared For

Mr. Leonard Hoffman

P.O. Box 844,

Kingman, Arizona



Retraced From Mine Record Map
 By E. Ross Hausholder E.M.
Registered Mining Engineer
429 E. Spring Street,
Kingman, Arizona
27 May 1946

0 100' 200' 300' 400' 500'
 Graphic Scale

Sketch Map Showing
 Elevation & Plan Of The
 Underground Workings
 Of The
Copperville Mine
Cedar Mining District
Mohave County, Arizona

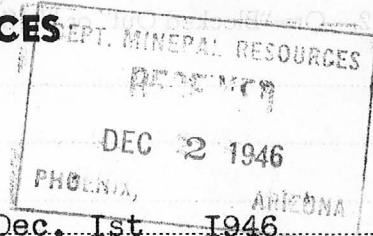
Tracing Especially Prepared
 For
Mr. Leonard Hoffman,
P.O. Box 814,
Kingman, Arizona

(To Accompany Report By Carl Anderson, Mining Met. Engineer)

DEPARTMENT OF MINERAL RESOURCES

State of Arizona

MINE OWNER'S REPORT



Date Dec. 1st 1946

1. Mine: SIAMESE GROUP Camp is better known as Copperville
2. Location: Sec. Twp. Range Walapai Nearest Town Yucca
Distance 25 Miles. Direction Road Condition
3. Mining District & County Cedar Mohave
4. Former Name of Mine: No former Name
5. Owner: Walter L. Hoffman. Leonard Hoffman resident Agent
Address: Box 814 Kingman Ariz.
6. Operator:
Address:
7. Principal Minerals: Lead, XX Zinc, Copper, Silver and Gold
8. Number of Claims: Nine, seven on Lode on vein, Placer two on side
Patented All patented Unpatented All taxes paid including 46
9. Type of Surrounding Terrain: Lowest point elevation 4600 to 5000 at the shaft
No. 2 4700, For further information Read Carl Anerson report.
and maps inclosed and LXX Leonard Hoffman Box 814 Kingman Ariz
10. Geology & Mineralization: I live in Kingman I will be ready to show preopert
any time, but through Holy days write me a few days ahead as I
may be with some of my children near Los Angeles .
Vavorable terms will be given to right partise
Under My managemen t all ~~WA~~ underground work was done except
the second 2 00 feet shaft sinking on shaft No. 2
11. Dimension & Value of Ore Body:

Leonard L. Hoffman
Box 814
Kingman Ariz

Please acknowledge
Receipts

NAME OF MINE: COPPERVILLE

COUNTY: MOHAVE ~~W~~
DISTRICT: CEDAR VALLEY
METALS: CU

OPERATOR AND ADDRESS:

MINE STATUS

DATE:

Mines Development ^{Inc.} Co.
M.B. Dudley,
Box 534, Kingman

DATE:

3/30/43 Accessibility loan granted
\$5000, \$9,500
3/1/44 Closed

MSB 9m - Bulletin 111

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MINES DEVELOPMENT, INC.

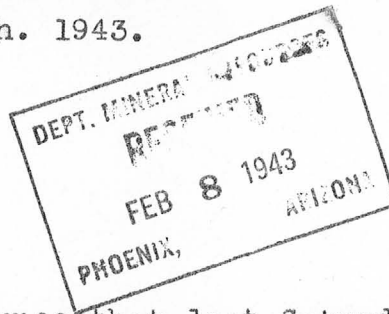
P. O. BOX 534

KINGMAN, ARIZONA

Feb 5th. 1943.

MINES IN
CEDAR VALLEY MINING DISTRICT
MOHAVE COUNTY, ARIZONA

Mr. J. S. Coupal.
Dept of Mineral Resources.
Phoenix, Arizona.



OFFICERS
M. B. DUDLEY
PRESIDENT
LEONARD HOFFMAN
VICE-PRESIDENT
J. H. HOFFMAN
SEC. & TREAS.

Dear Sam.,

Am pleased to announce that, last Saturday, we finished the dewatering and cleaning out of the Copperville property. Luckily we found the workings in excellent condition. The timbers in the shaft as well as in the drifts and cross-cuts were in perfect shape. That's sure one good break.

The boys got to work on the road immediately the storm ceased and, now have it in fair shape. It's no boulevard as you know.

Mr. Ralph Youtz, R.F.C. Engineer wires me that he will arrive here next Sunday, so we should now get some quick action.

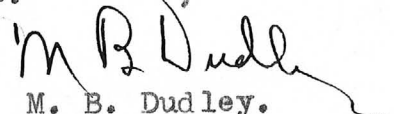
Sorry I did not know the condition when I saw you in Phoenix. A wire sent me by Hoffman miscarried, so I thought they were still marooned. Anyway, everything is now O.K.

I am assured some action shortly from Washington on our new road which, will help a lot.

The Leviathan Metals Corp., owners of the Leviathan mine on which I hold the lease, held their annual stockholders meeting in office of E.S. Clark, Monday Feb 11th. Theo Hollister, was re-elected president. He is a prominent mining man and attorney of Duluth, Minn. The stockholders were well represented by a big majority. I attended the meeting. Wish you would give this information to Charlie. I meant to call on him but neglected it.

With all good wishes.

Sincerely yours.


M. B. Dudley.

THE
LEVIATHAN MOLYBDENUM
MINE

P. O. BOX 534
KINGMAN, ARIZONA

July 5th. 1943.



Mr. J. S. Coupal.
Dept of Mineral Resources.
Phoenix, Arizona.

Dear Sam.,

I have neglected replying to your letter of June 26th regarding our pump at Copperville, until, I could say something definitely.

I find that it will not be possible for us to move this equipment, due to the fact that we are shortly to start dewatering between the 200 and 400 levels and, before this can be done, we will have to install additional pipe and plungers. The pump, as we bought it, was equipped to go only 220 feet, as the 200 level was the point we were interested in sampling. However, with the additional pipe and plungers, it will serve our ultimate purposes.

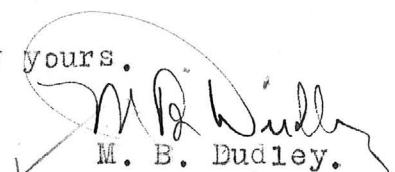
Sorry something could not have been worked out to assist in the other matter.

Was shocked to learn of Billy Grahams sudden passing. Did not know of it until Saturday evening.

Will be in Phoenix soon and see you.

With best wishes.

Sincerely yours.


M. B. Dudley.

DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA

OWNERS MINE REPORT

Date July 25, 1940

Mine **Siamese Group**
 Mining District & County **Cedar Valley - Location Yucca, Arizona**
Mohave county

Former Name

Owner **W. L. Hoffman** Address (Owner) **Enterprise, Kansas**

Operator **Not in operation now** Address (Operator)

President **Gen. Mgr.**

Mine Supt. **Mill Supt.**

Principal Metals **Silver, gold, lead, Men Employed**

copper and zinc

Production Rate **Mill: Type & Cap.**

Power: **Amt. & Type**

Operations: **Present No**

Operations Planned: **Rehabilitate by re-equipping mine with diesel power and electricity and oil floatation to present mill equipment, in other words, to rebuild the entire structure!**

Number Claims, Title, etc.: **Nine patented claims, seven on the out crop of the covering a distance of ten thousand five hundred feet in length and two side claims. Others can be located.**

Description: **Topography & Geography: The property is located on the east slope of the Wallapai Range of mountains, 25 miles east of Yucca, about 5 miles below the divide between Yucca and the mine, which is in the foothills of the main range at an elevation of about 5000 feet.**

Mine Workings: **Amt. & Condition: Mine workings consist of one shaft 5'x9' 305 feet in depth; one shaft 5'x15' three compartment 400 feet in depth, the two shafts are connected with a drift on the vein 1536 feet in length. On the 200 foot level at the main working shaft and at the bottom of the smaller shaft which is to the north of the main shaft. For further details see Mr. Carl Anderson's report which we attach to this report.**

Geology & Mineralization: As to the geology and mineralization we refer to Carl Anderson's report on the property.

Ore: Positive & Probable, Ore Dumps, Tailings: There is no tailings dump as the mill was not operated very long, as it did not save the values. No ore on dump to speak of, as the ore is left in stope of the mine as is described in Mr. Anderson's report.

Vein Width, Length, Value, etc: Main ore shoot is 350 long from 15 to 30 feet wide.

Mine, Mill Equipment & Flow Sheet: See Mr. Anderson's report.

Road Conditions, Route: Road was in good condition, but there was no work done on it for years, but it can again be made a good road at comparatively small outlay of money. (County will do most of the work.)

Water Supply: Ample water supply can be developed at very small cost. At present there is ample water for any size plant desired.

Brief History: This property was started in the summer of 1917 and a great deal of work was done up to 1917 until this country entered the World War. The mill was a failure; had there been a floatation mill no doubt the property would be in operations, as conditions are right for the development of a large producing mine. With proper development it will make one of Arizona's big producers.

Special Problems, Reports Filed: To make a success it will take an up-to-date floatation mill. The ore is there.

Remarks: Some of the equipment that was on the property can be used if desired. Will be pleased to take anyone interested in a large property to the property and enter into a definite understanding.

If property for sale: Price, terms and address to negotiate: The property is for sale or a long term lease on a 10% royalty basis will be given. Price can be arranged to suit. It can be paid out of royalty payments.

SIGNED: Leonard Hoffman or J. H. Hoffman
P. O. Box 534, Kingman, Arizona

DESCRIPTIVE REPORT ON THE SIAMESE GROUP
OF CLAIMS AND EQUIPMENT

CARL ANDERSON, MINING AND METALLURGICAL
ENGINEER

LOCATION AND GENERAL DESCRIPTION:

The property is located on the east slope of the Hualapai Range of Mountains, in the Cedar Valley Mining District, Mojave County, Arizona.

The property is reached by a 25 mile wagon road from Yucca, a station on the main line of the AT&SF Railroad. The road, which was constructed by the company at considerable expense, crosses the range at an elevation of about 5200 feet, with an average grade of 10 per cent over the mountain, and 5 ton loads are hauled from Yucca, elevation 1,840 feet, to the camp in six to eight hours, making comparatively cheap transportation.

The elevation at the mine is around 4,500 feet, giving an ideal climate for all year round work.

Except in a few small basins there is no timber on the range, but crude oil can be laid down at the mine at a reasonable price, giving cheaper and better power than wood under the best conditions. The mine requires but little timbering. The water supply is abundant.

THE MINING DISTRICT:

While practically no mining has been done the west slope of the range, the east slope is one continuous mineral belt for the entire length of the range, a distance of about 30 miles, and continues south to the MacCracken Mountains. The company's mines are in the center of this belt. The district presented considerable activity in earlier days in places where special geological and mineralogical conditions had caused a surface concentration in the silver values and when silver was high. In general, however, the veins are all very much alike.

The general character is a vein filling of quartz carrying gold, silver, lead, copper, zinc and iron, the difference being in the predominance of one of the metals in the different mines.

The inaccessibility of the district, scarcity of wood for fuel, and want of proper metallurgical process has kept this district back, but now with the advent of motor trucks, the development of the California oil fields, and improved methods of concentrating by oil flotation and separation, the transportation, fuel and treatment problems have been solved. The district should become one of the foremost mining centers of the United States, as all interests are now tending to the exploitation of large permanent propositions rather than the temporary mining.

PROPERTY:

The mining property consists of nine patented claims, a total of about 176 acres. Of these claims the five "Siamese" claims and two "Pittsburgh" claims are located on one vein, the other two claims being located on spurs which belong to the same vein system.

GEOLOGY:

The range is built up of coarse textured granitic rocks of volcanic origin of a comparatively late period, probably post Cretaceous.

It exhibits all the usual characteristics of an intruded granite. No district folding was observed and possibly none exists. It shows in numerous places the action of magmatic segregation of separate bands of hornblende, feldspar and quartz. This

2-1914

*

segregation took place while cooling, the segregated sheets showing the flow lines.

Other features are in the occurrence of barren glassy quartz veins, due to infiltration, filling shrinkage cracks. The granite is sheeted, the joining planes are mostly well apart, so that it weathers to large round boulders. The only other alteration observed, due to hydro-thermal action in connection with the vein filling, is not noticeable on the surface, and evidently does not extend but a short distance from the veins. The granite is of light colored acid variety, consisting mainly of quartz and pink orthoclase.

Of far less extent, but of greater importance, are the intruded dikes cutting through the granite. One in particular was examined. It crosses the north end of Side-line claim from the north and east, and near the north and center of Siamese No. 2 turns south and east, varying in width from 20 to 150 feet. It is along this contact that the vein is formed.

The diorite, when altered, is a hard, black, fine crystalline basic rock, which on weathering, softens and has a dark green tint due to the hornblende which predominates. It shows no grading into, or transition form away from the vein, but underground in the vein the two rocks, both altered, in places grade into each other. After cooling, due to the strain formed in cooling, a fault fissure was formed, which gave bent to the mineral bearing thermal springs that followed volcanic eruptions.

The hard granite hanging wall shows by striation and slickensides the movement between the hard rocks to be at an angle of 45 degrees from the horizontal.

The fissure, in the main, followed the contact. In places it cut through the granite close to the diorite and again through the diorite close to the granite.

The vein was gradually built up. Each period of hydrothermal action enlarged and enriched the vein. Cross-cut No. 4 on the hanging wall shows the structure of the ore to be symmetrical crusts, deposited in definite order as banded vein filling. That the vein was further faulted after forming is shown, for example, in the cut to the foot wall above cross-cut No. 7 where sharp cornered pieces of quartz from the vein are found in the gouge or attrition clay formed by movements along the wall. Many other features were observed, but are beyond the scope of this report.

The vein formation representative different periods, the character of the ore deposited probably also changed somewhat, so that the silver, lead and zinc represents one or several periods of deposition; the copper and gold probably other, though of course considerable intermingling took place; the copper replacing the iron as a secondary mineral. The mineral bearing waters being acid (silicious) naturally effected the basic diorite far more than the acid granite, on which it would have but little effect. The vein filling was then formed by metasomatic replacement of the diorite.

In parts, this replacement has been absolute, forming large bodies of mineralized quartz. This forms the main ore bodies. In places the diorite has only been partly replaced, making a silicified diorite well mineralized, of lower grade, but of milling value; and again the diorite can be found unaltered only showing quartz seams through out it; this occurs sparsely as "horses" in the vein.

As stated, the alteration of the granite has been but slight. In cross-cut No. 12, where the fault fissure cuts partly through the granite, the cracks between the crushed rocks have been filled with solid galena and zinc blend, testifying to the richness of the mineral bearing solutions. These seams which show, as a fine network through the entire granite mass within the vein, are places several inches wide making a good milling ore. In the main drift, where it crosses the vein from foot wall to hanging wall, the magmatic segregation of the granite can be observed.

THE VEIN AND ORE SHOOT:

The principal vein, and the only one exploited to any extent, is covered by seven patented claims, a total of 10,500 feet on the vein. It can be followed the entire distance by its outcrop, and where developed has been found to correspond to the showing underground.

The ore bodies have strong prominent outcrops forming the crest of the hill due to the massive quartz having protected the softer country rock from erosion.

Four separate ore shoots are proven, No. 1 about 200 feet long, from 4 to 8 feet wide, developed by main drift to a depth of 300 to 400 feet. In the south end of Siamese No. 1 north of shaft No. 1, No. 2 about 300 feet long, from 8 to 14 feet wide, developed by main drift to a depth of from 130 to 200 feet. In the center of Siamese No. 2, No. 4, from surface showing is about 400 feet long, and from 15 to 30 feet wide, developed by tunnel No. 2 for about 200 feet. It is on the south end of Siamese No. 3 and north end of Siamese No. 4. This would make, then, after deduction, 50 feet of almost entirely leached surface ore, a total of about 2,000,000 cubic feet or 150,000 tons of ore above present workings, which, with adequate mining and milling facilities, can be worked at a profit. Each additional 100 feet in depth would aggregate for the four ore shoots about 125,000 tons of ore.

The impoverishing of the vein through leaching by acid surface waters has been great. The oxidation of the pyrites caused the formation of sulphuric acid, which disclosed the copper, which probably already had been altered to oxides and carbonates. This leaching is still going on, as can be seen in tunnel No. 1 where crystalline tufts of chalcantite, or native sulphate of copper are still forming. THE EFFECT ON ZINC AND LEAD SULPHIDES HAS BEEN LESS, SO THESE ARE THE PREDOMINANT MINERALS IN THE MINE AT PRESENT DEPTH. There is, then, good reason to expect a material increase in copper values at permanent water level. Where found unaltered in the solid quartz the mineral gave by analysis 28.4% copper and 36.4% iron corresponding to bornite with a small per cent of pyrite. In Butte, Montana the large copper deposits are the results of leaching and re-precipitation of large bodies of vein matter carrying 1% and less in copper. The formation of sesquioxide of iron, a solvent of gold (Report United States Geological Survey) may equally have effected the gold values. Indications from copper stained decomposed vein matter are that the copper will favor the foot wall side of the vein.

WATER LEVEL:

From the comparative rapid decrease of oxidized ore, from the surface to the main shaft, a distance of 200 feet at shaft No. 2, there is reason to expect the permanent water level in a short distance, probably another 400 feet will reach it.

MINE DEVELOPMENT:

The main development work has been done on the Siamese No. 1, 2 and 3. On Siamese No. 1 a double compartment shaft 5x9 feet was sunk to a depth of 305 feet. At 285 feet drifts were driven north and south on the vein to the north, a distance of 600 feet, attaining a depth of 470 feet. Tunnel No. 1 was run a distance of 200 feet on the ledge intersecting the shaft at a depth of 80 feet and continues beyond the shaft for about 500 feet. From the station on the 285 foot level a drift south was driven about 950 feet following most of the distance the hanging wall. Between cross-cut 13 and 12 the drift cuts from the hanging wall to the foot wall.

Shaft No. 2, a 5x15 feet, 3 compartment, vertical shaft, was started on the hanging wall side of the vein, crosses the vein, and the bottom at 222 feet is in the foot wall. At a depth of 205 feet a drift was driven north, connecting with the south drift from shaft No. 1, making 1536 feet on the vein between shafts with 17 cross-cuts from 10 to 40 feet in length. The drift south from shaft No. 2 is 224 feet, making 2,360 feet continuous on the vein.

Tunnel No. 2 on Siamese No. 3 and 4 is about 500 feet long, 200 feet being driven on the foot wall side, of a well mineralized ore shoot, No. 4 attaining a depth of 220 feet. This tunnel is about 100 feet higher than the collar of shaft No. 2 and the mouth of the tunnel is about 1,000 feet south of the shaft.

Besides these workings there are numerous cuts, shallow shafts, etc., making a total of more than one mile of underground work. As can be seen from this description, only ore shoots No. 2 and 3 can be worked at present to advantage from shaft No. 2. From shoot No. 1 it would be over 1,500 feet upgrade traming, which is impractical. From shoot No. 4 there is no connection with the shaft.

At the 200-foot station of this shaft is a 16 x 16 x 10 feet sump for collection of mine water, into which flows the water pumped from the sump at shaft No. 1.

MINE EQUIPMENT:

Shaft No. 1 is equipped with a 12 H.P. Western Gasoline Hoist, cable and bucket, and a Luitweiler pump driven by a gasoline engine. At the 285-foot station is a Typhon pump driven by a 3 H.P. D.C. Motor, which pumps the water to the sump at shaft No. 2.

Shaft No. 2 is equipped with a steel gallows frame and two steel cages. The Hoist room is equipped with a Dillon-Box 82 H.P. double drum hoist driven by an 82 H.P. induction motor. It also contains an Ingersoll-Rand 17" x 10" x 14 air compressor driven by a 100 H.P. induction motor. At 200-foot station is a Luitweiler pump driven by a 5 H.P. D.C. Motor which lifts the water to the storage tanks above the mill.

There are five galvanized iron tanks with a combined capacity of 42,000 gallons. In addition the tailings and water is held in the gulch below the mill by a concrete dam, but considerable of the water escapes here. About one-half mile above the camp is a reservoir holding approximately 75,000 gallons.

THE ORE AND ITS VALUE:

The ore as referred to in several places in this report is a white crystalline quartz carrying gold, silver, copper, lead, zinc and iron. Small amounts of antimony and arsenic is found by analysis, and as much as 4/10ths per cent of bismuth in the concentrates.

The principal minerals are galena, carrying silver, zinc, blende, bornite (copper-iron-sulphide) and pyrites. The minerals are within zones fairly evenly distributed throughout the quartz, and while streaks and bunches of solid mineral are encountered, the ore does not occur in a way to make the sorting out of shipping ore practical. It is strictly a concentrating ore. No barite (heavy spar) is found, so a product clean from gangue material can be obtained. The different minerals have intergrown which led to the erroneous idea that fine crushing was necessary, but as the crystallization is fairly coarse, the minerals separate readily along the crystal faces.

In metal values, silver is first, next lead, then zinc, copper and gold. The possibility of copper predominating in depth has been referred to.

It can be readily seen that in a vein of this size and genesis the value of the ore depends entirely upon with what selection the ore is mined, and this selection again depends upon physical conditions in the mine, capacity of mill, etc. The assay records give numerous and various values for samples taken from different parts of the mine. To obtain as representative a sample as possible, samples were taken at regular intervals in the mill for five days during the examination. The mill was running one 8-hour shift per day, no more water being available, so the sample represents approximately 200 tons milled. As the ore was drawn by chutes from the stopes in the mine, and there are several thousand tons broken in the stopes, the sample may be considered to represent this tonnage. The average of the assays and analysis gave gold 0.01,

silver, 5.01 ounces; lead, 2.6 per cent; copper, 0.25 per cent; zinc, 4.3 per cent. The total metal value at present market prices would be \$10.54. Based on the price paid by the smelters, which is 55¢ per ounce for silver, 3¼¢ for lead, 3½¢ for zinc, and 10¢ per pound for copper. The ore has a value of \$8.15 per ton. To obtain these prices a fairly clean separation of the zinc from the other metals must be made, but this the mill should and can do. The silver is almost entirely combined with the lead at the ratio of two ounces of silver to each per cent of lead. That high grade concentrates can be readily made was demonstrated by cutting out samples from the tables while operating. Assays gave gold 0.30 ounces, silver 123.2 ounces, lead 50.8 per cent having a value of \$112.63 on above metal valuation.

The mill is yet in an experimental stage. The classification is far from perfect, so that the subsequent separation on the tables is very unsatisfactory. For this reason two products are now being made; one a shipping product, carrying 60 ounces silver, 30 per cent lead, value \$52.50, and a mixed product of lead, zinc and copper, which is being stored. A high per cent of saving on this ore should be made, 85 per cent or better. One of the great difficulties is the sliming of the minerals due to fine grinding.

Tests show that 70 per cent of the values of the ore was in the fine pulp if finer than 100 mesh. Crushing to 1mm or 20 mesh is ample, as it gives a perfect separation of gangue and mineral. The mill, with the exception of the Harding mill, has a capacity of 350 tons per day.

MILL EQUIPMENT:

The mill building is a steel frame constructure covered with corrugated galvanized iron, 50 x 120 feet, cement floors and fire proof throughout.

The ore, as delivered by car direct from the mine, is dumped in the grizzly which has a 1½ inch opening; the oversize drops in a "D" Gates Crusher, driven by a 25 H.P. motor where it is crushed to about 1½ inch size. Both products from crusher and grizzly are discharged on to a shaking screen with 10 mm. holes, the fines going to one bin, the oversize to another. Each of these bins have a capacity of 300 tons and are built of reinforced concrete.

The ore from the oversize bin is by scraper conveyor taken to a 24 inch Symons Disc Crusher, where it is broken to about ½ inch mesh, a shaking screen with 4 mm openings, carries the oversize to an 8 foot Harding's Pebble mill.

The fine ore from the other bin is by scraper conveyor fed on a 4 mesh screen, the oversize going to the Pebble mill; the undersize, together with the undersize from the Disc Crusher, is by shaking launder carried to an Overstrom Classifier where it mixes with the product from the Pebble Mill. Conveyors and shaking launders are driven by a 50 H.P. A.C. Motor. From the classifier the different results are distributed to the concentrating tables, which are the Overstrom pattern, 14 in all.

The slimes are divided between two slime tables. From the five following columns the material goes to five sand tables, and the last and coarsest material from the emergency column to two roughing tables. The middlings from these two tables are by an elevator returned to the Pebble mill for regrinding. From the other tables four products are at present obtained.

No. 1, high silver and lead, which is being shipped. No. 2 carrying a small per cent of silver and lead, with copper, zinc and iron, which is being run into storage bins for future treatments. No. 3, middlings, which by elevator is taken to Classifier No. 2. No. 4, tailings which are run into the tailing pond for the recovery of the water if necessary.

In classifier No. 2, similar to No. 1, the midlings are again classified into five sizes and distributed over five more tables where the division of the products is the same as above. At the lower end of the mill are four concrete storage tanks, 14' x 12' x 3½', each capable of holding 20 tons of concentrates. Part of these tanks are now being used for water storage and settling. The water from the tailing pond is returned to these tanks by a 4 inch centrifugal pump driven by a 25 H.P. motor. From here it flows to another 4 inch pump which raises it into the mill. The tables, elevators and mill pumps are driven by a 25 H.P. motor.

POWER PLANT:

The power plant is housed in a steel structure covered with corrugated galvanized iron and cement floor. The power is furnished by two 150 H.P. Meitz and Weiss Oil engines, directly connected to two 100 K.H.A3 cycle generators.

The plant includes a 10 K.W.D.C. generator and transformer. The mine, mill and camp are lighted by electricity. Crude oil is used for fuel and at 4½ cents a gallon delivered at the mine, represents less than 1/2 cent per H.P. hour.

Other equipment consists of machine shop with lathe and drill press, driven by a 10 H.P. motor; a blacksmith shop with a Leyner drill sharpener worked by compressed air, assay office and chemical laboratory complete, survey instruments, etc., frame office building, tent bunk and cook house. The Company owns three 6-ton Sauer motor trucks for hauling supplies and concentrates.

RECOMMENDATIONS:

No time should be lost in placing the property on a dividend paying basis. Shaft No. 2 should be sunk another 200 feet, preferably deeper, and levels driven north each 100 feet to develop ore shoots No. 2 and 3. At the 400 foot station the drift should also be driven south to exploit ore shoot No. 4. At this depth the drift would be five hundred feet below tunnel No. 2 and 700 feet below the apex of the vein. As far as surface showings, No. 4 ore shoot gives better promise than No. 1 and 2. and equals No. 3, the replacement of the diorite having been complete. On the main drift in shoot No. 3, it should be, in a crosscut or two, ascertained if the diorite showing is the hanging wall, is the true wall. Shoot No. 2 could be further exploited to advantage in crosscut No. 12 by a raise on account of the rich seams in the granite. It is paramount that the shaft be sunk, not only for the increase in water supply, which undoubtedly will be heavy considering the increase for the distance sunk, but it would require two or three working levels to handle the tonnage on single track and extract the ore at minimum cost.

In the mill, all the material from crusher and grizzlies of a size equal to the product of the disc grinder should at once be screened out. This would relieve considerably. From the disc grinder the ore, to prevent sliming, should be further reduced by rolls, any standard make, to not finer than 10 mesh, and the returned midlings not finer than 20 mesh. This will insure complete separation of gangue and minerals without sliming. By this coarse grinding, the product being all of a more size, better results will undoubtedly be gotten by the classifier. This will enable the tables to perform better work, and a higher grade and better amount of concentrates will result.

CONCLUSION:

You have a valuable mining proposition. The extent of the vein on the surface gives assurance of permanency in depth. The development work has shown large defined ore bodies and the work has been done in a workmanlike manner. The surface equipment is first class and up-to-date.

Respectfully submitted,

Signed

Carl Anderson, M.&Met. E.
Member Am. Inst. of E.M.
Member North of Engl. Inst.
of M. and Mech. Engineering

SHATTUCK DENN MINING CORPORATION
and
SUBSIDIARIES

Humboldt, Arizona

Office

August 12, 1967

Date

TO: Engineering Dept.
Humboldt

SUBJECT: COPPERVILLE MINE

FROM: Jack C. Pierce

Do we have any information on the subject in our files?

Please return the attached summary.

JCP/mj

*

Since the above report was made by Mr. Anderson, shaft No. 2 has been sunk to the 400-foot level, a station cut at the 400-foot level, and a drift run to the north about 177 feet, in the foot wall, (not on the ledge). At this point a crosscut was started and from every indication the face of crosscut is near the ore shoot, No. 3 opened up above on the two hundred foot level.

Signed J. H. Hoffman

LIST OF MACHINERY & EQUIPMENT NOW AT
COPPERVILLE

May 23, 1940

- 1 - Ingersoll-Rand Type No. 10 Compressor 17 x 14 -- 10 x 14
- 1 - Dillon - Box Double Drum Electric Hoist, 82 H.P. driven by an 82 H.P. Induction Motor. (with cable)
- 1 - Induction Motor G.E. 120 AM Volts 440 - 100 H.P.
- 1 - 1-50 foot steel Gallus frame
- 2 - Mine shaft cages
- 5 - Mine cars
- 6 - Large corrugated iron tanks
- 1 - Allis Chalmers Co., Gates Giratory Crusher "D"
- 1 - Hargind 8-foot Pebble Mill
- 1 - Wagner Mfg. Co. Motor 50 H.P. 440 volts 59 Am.
- 2 - Web- City Rells 16 inch face
- 1 - 24 inch Symons Disc Crusher
- 2 - 150 H.P. Meitz and Weiss Hot Head Oil Engines, directly connected to two 100 K.W. A. 3 cycle Westinghouse generators.
- 1 - 1 10 K.W.D.C. Generator and transformer

Power equipment in bad shape

- 1 - 12 H.P. Wetsern Gasoline Hoist
- 1 - Electric Motor H.P.
- 1 - Milling Building 120 x 50 feet, all steel structure, concrete floors.
- 1 - Power House, Steel Structure, concrete floor.

The buildings were covered with galvanized iron, but most of it is stripped and taken off by thieves, as well as all other equipment is stolen except the above list of machinery and equipment which is still in place.

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

Date July 25, 1940

1. Mine SIAMESE Group
2. Location Yucca, Arizona
3. Mining District & County Ceder Valley, Mohave.
4. Former name no change in name
5. Owner W.L. Hoffman
6. Address (Owner) Enterprise, Kansas
7. Operator Not now in operation
8. Address (Operator)
9. President, Owning Co.
- 9A. President, Operating Co.
10. Gen. Mgr.
14. Principal Minerals Silver, gold lead ~~iron~~ copper, & zinc
11. Mine Supt.
15. Production Rate
12. Mill Supt.
16. Mill: Type & Cap.
13. Men Employed
17. Power: Amt. & Type
18. Operations: Present No
19. Operations: Planned Rehabilitate by reequipping mine with Diesle Power and Elictracy and ~~NA~~ Oil floatation to present mill equipment, in other words to rebuild the entire structure.
20. Number Claims, Title, etc. Nine patented claims, seven on the out crop of the covering a distance of ten thousand five hundred feet in length, and two side claims. Others can be located.
21. Description: Topography & Geography The property is located on the East slope of the Wallapai Range of Mountains, twenty five miles East of Yucca, about five miles below the divide between Yucca and the mine, which is in the foot hills of the main range at an elavation of about 5000 feet.
22. Mine Workings: Amt. & Condition Mine workings consists of 1 shaft 5X9' 305 feet in depth, 1 shaft 5'X 15' 3 compartment 400 feet in depth, the two shafts are connected with a drift on the vein 1536 feet in length. on the 200 foot level at the main working shaft and at the bottom of the smaller shaft which is to the North of the main shaft. for further detalis see Mr. Carl Anderson's report which we attach to this report.

23. Geology & Mineralization , as to the geology and mineralization we refer to Carl Anderson' report on the property.
24. Ore: Positive & Probable, Ore Dumps, Tailings , there is no tailings dump, as the mill was not operated very long, as it did not save the values. No ore on dump to speak of, as the ore is left in stope of the mine, as is described in Mr. Anderson's report.
- 24A. Dimensions and Value of Ore body Main ore shoot is 350 long from 15 to 30 feet wide.
25. Mine, Mill Equipment & Flow-Sheet See Mr. Anderson' report.
26. Road Conditions, Route road was in good conditon , but ther was no work done on it for years, but it can again be made a good road at comparatively small out lay of money. (County will do most of the work)
27. Water Supply Ample water supply can be developed at very small cost. At present there is aple water for any size plant desired .
28. Brief History This property was started in the summer of 1917 and a great deal of work was done up to 1917, until this country entered the world war. The mill was a failure, had there been a floatation mill, no doubt the property would be in operation, as conditions, are right for the development of a large producing mine. With proper development it will make one of Arizonas big producers.
29. Special Problems, Reports Filed
To make a success it will take an-up to date floatation mill. The ore is there .
30. Remarks Some of the equipment that was on the property can be used, if desired. Will be pleased to take any one interest in a large property, to the property, and enter into a definite understanding.
31. If property for sale: Price, terms and address to negotiate. the property is for sale or a long term lease on a ten percent royalty basis will be given . Price can be arranged to suit, ~~so~~ it can be paid out of royalty payments.

32. Signature

Leonard Hoffman or J. Hoffman
P.O. BOX 534 Kingman Arizona

33. Use additional sheets if necessary.

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
OWNERS MINE REPORT

Date July 25, 1940

Mine Siamese Group

Mining District & County Cedar Valley - Location Yucca, Arizona
Mohave county

Former Name

Owner W. L. Hoffman

Address (Owner) Enterprise, Kansas

Operator Not in operation now

Address (Operator)

President

Gen. Mgr.

Mine Supt.

Mill Supt.

Principal Metals Silver, gold, lead,
copper and zinc

Men Employed

Production Rate

Mill: Type & Cap.

Power: Amt. & Type

Operations: Present No

Operations Planned: Rehabilitate by re-equipping mine with diesel power and electricity and oil floatation to present mill equipment, in other words, to rebuild the entire structure.

Number Claims, Title, etc.: Nine patented claims, seven on the out crop of the covering a distance of ten thousand five hundred feet in length and two side claims. Others can be located.

Description: Topography & Geography: The property is located on the east slope of the Wallapai Range of mountains, 25 miles east of Yucca, about 5 miles below the divide between Yucca and the mine, which is in the foothills of the main range at an elevation of about 5000 feet.

Mine Workings: Amt. & Condition: Mine workings consist of one shaft 5'x9' 1305 feet in depth; one shaft 5'x15' three compartment 400 feet in depth, the two shafts are connected with a drift on the vein 1536 feet in length. On the 200 foot level at the main working shaft and at the bottom of the smaller shaft which is to the north of the main shaft. For further details see Mr. Carl Anderson's report which we attach to this report.

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(over)

Geology & Mineralization: As to the geology and mineralization we refer to Carl Anderson's report on the property.

Ore: Positive & Probable, Ore Dumps, Tailings: There is no tailings dump as the mill was not operated very long, as it did not save the values. No ore on dump to speak of, as the ore is left in stope of the mine as is described in Mr. Anderson's report.

Vein Width, Length, Value, etc: Main ore shoot is 350 long from 15 to 30 feet wide.

Mine, Mill Equipment & Flow Sheet: See Mr. Anderson's report.

Road Conditions, Route: Road was in good condition, but there was no work done on it for years, but it can again be made a good road at comparatively small outlay of money. (County will do most of the work.

Water Supply: Ample water supply can be developed at very small cost. At present there is ample water for any size plant desired.

Brief History: This property was started in the summer of 1917 and a great deal of work was done up to 1917 until this country entered the World War. The mill was a failure; had there been a floatation mill no doubt the property would be in operations, as conditions are right for the development of a large producing mine. With proper development it will make one of Arizona's big producers.

Special Problems, Reports Filed: To make a success it will take an up-to-date floatation mill. The ore is there.

Remarks: Some of the equipment that was on the property can be used if desired. Will be pleased to take anyone interested in a large property to the property and enter into a definite understanding.

If property for sale: Price, terms and address to negotiate: The property is for sale or a long term lease on a 10% royalty basis will be given. Price can be arranged to suit. It can be paid out of royalty payments.

SIGNED: Leonard Hoffman or J. H. Hoffman
P. O. Box 534, Kingman, Arizona

MS-51

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
OWNERS MINE REPORT

Date July 25, 1940

1. Mine Siamese Group
2. Mining District & County Cedar Valley - Mohave County
3. Former name
4. Location Yucca, Arizona
5. Owner W. L. Hoffman
6. Address (Owner) Enterprise, Kansas
7. Operator not now in operation
8. Address (Operator)
9. President
10. Gen. Mgr.
11. Mine Supt.
12. Mill Supt.
13. Principal Metals Silver, gold, lead, copper and zinc
14. Men Employed
15. Production Rate
16. Mill: Type & Cap.
17. Power: Amt. & Type
18. Operations: Present No
19. Operations Planned Rehabilitate by reequipping mine with Diesel Power and Electricity and oil floatation to present mill equipment, in other words to rebuild the entire structure.
20. Number Claims, Title, etc. Nine patented claims, seven on the out crop of the covering a distance of ten thousand five hundred feet in length, and two side claims. Others can be located.
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22. Mine Workings: Amt. & Condition Mine workings consists of one shaft 5x9' 305 feet in depth; one shaft 5x15' 3 compartment 400 feet in depth, the two shafts are connected with a drift on the vein 1536 feet in length. On the 200 foot level at the main working shaft and at the bottom of the smaller shaft which is to the North of the main shaft, for further details see Mr. Carl Anderson's report which we attach to this report.

23. Geology & Mineralization As to the geology and mineralization we refer to Carl Anderson's report on the property.

24. Ore: Positive & Probable, Ore Dumps, Tailings There is no tailings dump, as the mill was not operated very long. As it did not save the values. No ore on dump to speak of, as the ore is left in stope of the mine, as is described in Mr. Anderson's report.

24-A Vein Width, Length, Value, etc. Main ore shoot is 350 long from 15 to 30 feet wide.

25. Mine, Mill Equipment & Flow Sheet See Mr. Anderson's report.

26. Road Conditions, Route Road was in good condition, but there was no work done on it for years, but it can again be made a good road at comparatively small outlay of money. (County will do most of the work).

27. Water Supply Ample water supply can be developed at very small cost. At present there is ample water for any size plant desired.

28. Brief History This property was started in the summer of 1917 and a great deal of work was done up to 1917, until this country entered the world war. The mill was a failure, had there been a floatation mill, no doubt the property would be in operations, as conditions, are right for the development of a large producing mine. With proper development it will make one of Arizona's big producers.

29. Special Problems, Reports Filed To make a success it will take an up-to-date floatation mill. The ore is there.

30. Remarks Some of the equipment that was on the property can be used, if desired. Will be pleased to take any one interested in a large property, to the property, and enter into a definite understanding.

31. If property for sale: Price, terms and address to negotiate. The property is for sale or a long term lease on a 10% royalty basis will be given. Price can be arranged to suit, it can be paid out of royalty payments.

32. Signed Leonard Hoffman or J. H. Hoffman
P. O. Box 534, Kingman, Arizona.

33. Use additional sheets if necessary.

DESCRIPTIVE REPORT ON THE SIAMESE GROUP
OF CLAIMS AND EQUIPMENT

CARL ANDERSON, MINING AND METALLURGICAL
ENGINEER

LOCATION AND GENERAL DESCRIPTION:

The property is located on the east slope of the Hualapai Range of Mountains, in the Cedar Valley Mining District, Mojave County, Arizona.

The property is reached by a 25 mile wagon road from Yucca, a station on the main line of the AT&SF Railroad. The road, which was constructed by the company at considerable expense, crosses the range at an elevation of about 5200 feet, with an average grade of 10 per cent over the mountain, and 5 ton loads are hauled from Yucca, elevation 1,840 feet, to the camp in six to eight hours, making comparatively cheap transportation.

The elevation at the mine is around 4,500 feet, giving an ideal climate for all year round work.

Except in a few small basins there is no timber on the range, but crude oil can be laid down at the mine at a reasonable price, giving cheaper and better power than wood under the best conditions. The mine requires but little timbering. The water supply is abundant.

THE MINING DISTRICT:

While practically no mining has been done the west slope of the range, the east slope is one continuous mineral belt for the entire length of the range, a distance of about 30 miles, and continues south to the MacCracken Mountains. The company's mines are in the center of this belt. The district presented considerable activity in earlier days in places where special geological and mineralogical conditions had caused a surface concentration in the silver values and when silver was high. In general, however, the veins are all very much alike.

The general character is a vein filling of quartz carrying gold, silver, lead, copper, zinc and iron, the difference being in the predominance of one of the metals in the different mines.

The inaccessibility of the district, scarcity of wood for fuel, and want of proper metallurgical process has kept this district back, but now with the advent of motor trucks, the development of the California oil fields, and improved methods of concentrating by oil flotation and separation, the transportation, fuel and treatment problems have been solved. The district should become one of the foremost mining centers of the United States, as all interests are now tending to the exploitation of large permanent propositions rather than the temporary mining.

PROPERTY:

The mining property consists of nine patented claims, a total of about 176 acres. Of these claims the five "Siamese" claims and two "Pittsburgh" claims are located on one vein, the other two claims being located on spurs which belong to the same vein system.

GEOLOGY:

The range is built up of coarse textured granitic rocks of volcanic origin of a comparatively late period, probably post Cretaceous.

It exhibits all the usual characteristics of an intruded granite. No district folding was observed and possibly none exists. It shows in numerous places the action of magmatic segregation of separate bands of hornblende, feldspar and quartz. This

2-1914

segregation took place while cooling, the segregated sheets showing the flow lines.

Other features are in the occurrence of barren glassy quartz veins, due to infiltration, filling shrinkage cracks. The granite is sheeted, the joining planes are mostly well apart, so that it weathers to large round boulders. The only other alteration observed, due to hydro-thermal action in connection with the vein filling, is not noticeable on the surface, and evidently does not extend but a short distance from the veins. The granite is of light colored acid variety, consisting mainly of quartz and pink orthoclase.

Of far less extent, but of greater importance, are the intruded dikes cutting through the granite. One in particular was examined. It crosses the north end of Side-line claim from the north and east, and near the north and center of Siamese No. 2 turns south and east, varying in width from 20 to 150 feet. It is along this contact that the vein is formed.

The diorite, when altered, is a hard, black, fine crystalline basic rock, which on weathering, softens and has a dark green tint due to the hornblende which predominates. It shows no grading into, or transition form away from the vein, but underground in the vein the two rocks, both altered, in places grade into each other. After cooling, due to the strain formed in cooling, a fault fissure was formed, which gave bent to the mineral bearing thermal springs that followed volcanic eruptions.

The hard granite hanging wall shows by striation and slickensides the movement between the hard rocks to be at an angle of 45 degrees from the horizontal.

The fissure, in the main, followed the contact. In places it cut through the granite close to the diorite and again through the diorite close to the granite.

The vein was gradually built up. Each period of hydrothermal action enlarged and enriched the vein. Cross-cut No. 4 on the hanging wall shows the structure of the ore to be symmetrical crusts, deposited in definite order as banded vein filling. That the vein was further faulted after forming is shown, for example, in the cut to the foot wall above cross-cut No. 7 where sharp cornered pieces of quartz from the vein are found in the gouge or attrition clay formed by movements along the wall. Many other features were observed, but are beyond the scope of this report.

The vein formation representative different periods, the character of the ore deposited probably also changed somewhat, so that the silver, lead and zinc represents one or several periods of deposition; the copper and gold probably other, though of course considerable intermingling took place; the copper replacing the iron as a secondary mineral. The mineral bearing waters being acid (silicious) naturally effected the basic diorite far more than the acid granite, on which it would have but little effect. The vein filling was then formed by metasomatic replacement of the diorite.

In parts, this replacement has been absolute, forming large bodies of mineralized quartz. This forms the main ore bodies. In places the diorite has only been partly replaced, making a silicified diorite well mineralized, of lower grade, but of milling value; and again the diorite can be found unaltered only showing quartz seams through out it; this occurs sparsely as "horses" in the vein.

As stated, the alteration of the granite has been but slight. In cross-cut No. 12, where the fault fissure cuts partly through the granite, the cracks between the crushed rocks have been filled with solid galena and zinc blend, testifying to the richness of the mineral bearing solutions. These seams which show, as a fine network through the entire granite mass within the vein, are places several inches wide making a good milling ore. In the main drift, where it crosses the vein from foot wall to hanging wall, the magnetic segregation of the granite can be observed.

THE VEIN AND ORE SHOOTS:

The principal vein, and the only one exploited to any extent, is covered by seven patented claims, a total of 10,500 feet on the vein. It can be followed the entire distance by its outcrop, and where developed has been found to correspond to the showing underground.

The ore bodies have strong prominent outcrops forming the crest of the hill due to the massive quartz having protected the softer country rock from erosion.

Four separate ore shoots are proven, No. 1 about 200 feet long, from 4 to 8 feet wide, developed by main drift to a depth of 300 to 400 feet. In the south end of Siamese No. 1 north of shaft No. 1, No. 2 about 300 feet long, from 8 to 14 feet wide, developed by main drift to a depth of from 130 to 200 feet. In the center of Siamese No. 2, No. 4, from surface showing is about 400 feet long, and from 15 to 30 feet wide, developed by tunnel No. 2 for about 200 feet. It is on the south end of Siamese No. 3 and north end of Siamese No. 4. This would make, then, after deduction, 50 feet of almost entirely leached surface ore, a total of about 2,000,000 cubic feet or 150,000 tons of ore above present workings, which, with adequate mining and milling facilities, can be worked at a profit. Each additional 100 feet in depth would aggregate for the four ore shoots about 125,000 tons of ore.

The impoverishing of the vein through leaching by acid surface waters has been great. The oxidation of the pyrites caused the formation of sulphuric acid, which disclosed the copper, which probably already had been altered to oxides and carbonates. This leaching is still going on, as can be seen in tunnel No. 1 where crystalline tufts of chalcantinite, or native sulphate of copper are still forming. THE EFFECT ON ZINC AND LEAD SULPHIDES HAS BEEN LESS, SO THESE ARE THE PREDOMINANT MINERALS IN THE MINE AT PRESENT DEPTH. There is, then, good reason to expect a material increase in copper values at permanent water level. Where found unaltered in the solid quartz the mineral gave by analysis 28.4% copper and 36.4% iron corresponding to bornite with a small per cent of pyrite. In Butte, Montana the large copper deposits are the results of leaching and re-precipitation of large bodies of vein matter carrying 1% and less in copper. The formation of sesquioxide of iron, a solvent of gold (Report United States Geological Survey) may equally have effected the gold values. Indications from copper stained decomposed vein matter are that the copper will favor the foot wall side of the vein.

WATER LEVEL:

From the comparative rapid decrease of oxidized ore, from the surface to the main shaft, a distance of 200 feet at shaft No. 2, there is reason to expect the permanent water level in a short distance, probably another 400 feet will reach it.

MINE DEVELOPMENT:

The main development work has been done on the Siamese No. 1, 2 and 3. On Siamese No. 1 a double compartment shaft 5x9 feet was sunk to a depth of 305 feet. At 285 feet drifts were driven north and south on the vein to the north, a distance of 600 feet, attaining a depth of 470 feet. Tunnel No. 1 was run a distance of 200 feet on the ledge intersecting the shaft at a depth of 80 feet and continues beyond the shaft for about 500 feet. From the station on the 285 foot level a drift south was driven about 950 feet following most of the distance the hanging wall. Between cross-cut 13 and 12 the drift cuts from the hanging wall to the foot wall.

Shaft No. 2, a 5x15 feet, 3 compartment, vertical shaft, was started on the hanging wall side of the vein, crosses the vein, and the bottom at 222 feet is in the foot wall. At a depth of 205 feet a drift was driven north, connecting with the south drift from shaft No. 1, making 1536 feet on the vein between shafts with 17 cross-cuts from 10 to 40 feet in length. The drift south from shaft No. 2 is 224 feet, making 2,360 feet continuous on the vein.

Tunnel No. 2 on Siamese No. 3 and 4 is about 500 feet long, 200 feet being driven on the foot wall side, of a well mineralized ore shoot, No. 4 attaining a depth of 220 feet. This tunnel is about 100 feet higher than the collar of shaft No. 2 and the mouth of the tunnel is about 1,000 feet south of the shaft.

Besides these workings there are numerous cuts, shallow shafts, etc., making a total of more than one mile of underground work. As can be seen from this description, only ore shoots No. 2 and 3 can be worked at present to advantage from shaft No. 2. From shoot No. 1 it would be over 1,500 feet upgrade traming, which is impractical. From shoot No. 4 there is no connection with the shaft.

At the 200-foot station of this shaft is a 16 x 16 x 10 feet sump for collection of mine water, into which flows the water pumped from the sump at shaft No. 1.

MINE EQUIPMENT:

Shaft No. 1 is equipped with a 12 H.P. Western Gasoline Hoist, cable and bucket, and a Luitweiler pump driven by a gasoline engine. At the 285-foot station is a Typhon pump driven by a 3 H.P. D.C. Motor, which pumps the water to the sump at shaft No. 2.

Shaft No. 2 is equipped with a steel gallows frame and two steel cages. The Hoist room is equipped with a Dillon-Box 82 H.P. double drum hoist driven by an 82 H.P. induction motor. It also contains an Ingersoll-Rand 17" x 10" x 14 air compressor driven by a 100 H.P. induction motor. At 200-foot station is a Luitweiler pump driven by a 5 H.P. D.C. Motor which lifts the water to the storage tanks above the mill.

There are five galvanized iron tanks with a combined capacity of 42,000 gallons. In addition the tailings and water is held in the gulch below the mill by a concrete dam, but considerable of the water escapes here. About one-half mile above the camp is a reservoir holding approximately 75,000 gallons.

THE ORE AND ITS VALUE:

The ore as referred to in several places in this report is a white crystalline quartz carrying gold, silver, copper, lead, zinc and iron. Small amounts of antimony and arsenic is found by analysis, and as much as 4/10ths per cent of bismuth in the concentrates.

The principal minerals are galena, carrying silver, zinc, blende, bornite (copper-iron-sulphide) and pyrites. The minerals are within zones fairly evenly distributed throughout the quartz, and while streaks and bunches of solid mineral are encountered, the ore does not occur in a way to make the sorting out of shipping ore practical. It is strictly a concentrating ore. No barite (heavy spar) is found, so a product clean from gangue material can be obtained. The different minerals have intergrown which led to the erroneous idea that fine crushing was necessary, but as the crystallization is fairly coarse, the minerals separate readily along the crystal faces.

In metal values, silver is first, next lead, then zinc, copper and gold. The possibility of copper predominating in depth has been referred to.

It can be readily seen that in a vein of this size and genesis the value of the ore depends entirely upon with what selection the ore is mined, and this selection again depends upon physical conditions in the mine, capacity of mill, etc. The assay records give numerous and various values for samples taken from different parts of the mine. To obtain as representative a sample as possible, samples were taken at regular intervals in the mill for five days during the examination. The mill was running one 8-hour shift per day, no more water being available, so the sample represents approximately 200 tons milled. As the ore was drawn by chutes from the stopes in the mine, and there are several thousand tons broken in the stopes, the sample may be considered to represent this tonnage. The average of the assays and analysis gave gold 0.01,

silver, 5.01 ounces; lead, 2.6 per cent; copper, 0.25 per cent; zinc, 4.3 per cent. The total metal value at present market prices would be \$10.54. Based on the price paid by the smelters, which is 55¢ per ounce for silver, 3¼¢ for lead, 3½¢ for zinc, and 10¢ per pound for copper. The ore has a value of \$8.15 per ton. To obtain these prices a fairly clean separation of the zinc from the other metals must be made, but this the mill should and can do. The silver is almost entirely combined with the lead at the ratio of two ounces of silver to each per cent of lead. That high grade concentrates can be readily made was demonstrated by cutting out samples from the tables while operating. Assays gave gold 0.30 ounces, silver 123.2 ounces, lead 50.8 per cent having a value of \$112.63 on above metal valuation.

The mill is yet in an experimental stage. The classification is far from perfect, so that the subsequent separation on the tables is very unsatisfactory. For this reason two products are now being made; one a shipping product, carrying 60 ounces silver, 30 per cent lead, value \$52.50, and a mixed product of lead, zinc and copper, which is being stored. A high per cent of saving on this ore should be made, 85 per cent or better. One of the great difficulties is the sliming of the minerals due to fine grinding.

Tests show that 70 per cent of the values of the ore was in the fine pulp if finer than 100 mesh. Crushing to 1mm or 20 mesh is ample, as it gives a perfect separation of gangue and mineral. The mill, with the exception of the Harding mill, has a capacity of 350 tons per day.

MILL EQUIPMENT:

The mill building is a steel frame structure covered with corrugated galvanized iron, 50 x 120 feet, cement floors and fire proof throughout.

The ore, as delivered by car direct from the mine, is dumped in the grizzlie which has a 1½ inch opening; the oversize drops in a "D" Gates Crusher, driven by a 25 H.P. motor where it is crushed to about 1½ inch size. Both products from crusher and grizzlie are discharged on to a shaking screen with 10 mm. holes, the fines going to one bin, the oversize to another. Each of these bins have a capacity of 300 tons and are built of reinforced concrete.

The ore from the oversize bin is by scraper conveyor taken to a 24 inch Symons Disc Crusher, where it is broken to about ½ inch mesh, a shaking screen with 4 mm openings, carries the oversize to an 8 foot Harding's Pebble mill.

The fine ore from the other bin is by scraper conveyor fed on a 4 mesh screen, the oversize going to the Pebble mill; the undersize, together with the undersize from the Disc Crusher, is by shaking launder carried to an Overstrom Classifier where it mixes with the product from the Pebble Mill. Conveyors and shaking launders are driven by a 50 H.P. A.C. Motor. From the classifier the different results are distributed to the concentrating tables, which are the Overstrom pattern, 14 in all.

The slimes are divided between two slime tables. From the five following columns the material goes to five sand tables, and the last and coarsest material from the emergency column to two roughing tables. The midlings from these two tables are by an elevator returned to the Pebble mill for regrinding. From the other tables four products are at present obtained.

No. 1, high silver and lead, which is being shipped. No. 2 carrying a small per cent of silver and lead, with copper, zinc and iron, which is being run into storage bins for future treatments. No. 3, midlings, which by elevator is taken to Classifier No. 2. No. 4, tailings which are run into the tailing pond for the recovery of the water if necessary.

In classifier No. 2, similar to No. 1, the midlings are again classified into five sizes and distributed over five more tables where the division of the products is the same as above. At the lower end of the mill are four concrete storage tanks, 14' x 12' x 3½', each capable of holding 20 tons of concentrates. Part of these tanks are now being used for water storage and settling. The water from the tailing pond is returned to these tanks by a 4 inch centrifugal pump driven by a 25 H.P. motor. From here it flows to another 4 inch pump which raises it into the mill. The tables, elevators and mill pumps are driven by a 25 H.P. motor.

POWER PLANT:

The power plant is housed in a steel structure covered with corrugated galvanized iron and cement floor. The power is furnished by two 150 H.P. Meitz and Weiss Oil engines, directly connected to two 100 K.H.A3 cycle generators. The plant includes a 10 K.W.D.C. generator and transformer. The mine, mill and camp are lighted by electricity. Crude oil is used for fuel and at 4½ cents a gallon delivered at the mine, represents less than 1/2 cent per H.P. hour.

Other equipment consists of machine shop with lathe and drill press, driven by a 10 H.P. motor; a blacksmith shop with a Leyner drill sharpener worked by compressed air, assay office and chemical laboratory complete, survey instruments, etc., frame office building, tent bunk and cook house. The Company owns three 6-ton Sauer motor trucks for hauling supplies and concentrates.

RECOMMENDATIONS:

No time should be lost in placing the property on a dividend paying basis. Shaft No. 2 should be sunk another 200 feet, preferably deeper, and levels driven north each 100 feet to develop ore shoots No. 2 and 3. At the 400 foot station the drift should also be driven south to exploit ore shoot No. 4. At this depth the drift would be five hundred feet below tunnel No. 2 and 700 feet below the apex of the vein. As far as surface showings, No. 4 ore shoot gives better promise than No. 1 and 2, and equals No. 3, the replacement of the diorite having been complete. On the main drift in shoot No. 3, it should be, in a crosscut or two, ascertained if the diorite showing is the hanging wall, is the true wall. Shoot No. 2 could be further exploited to advantage in crosscut No. 12 by a raise on account of the rich seams in the granite. It is paramount that the shaft be sunk, not only for the increase in water supply, which undoubtedly will be heavy considering the increase for the distance sunk, but it would require two or three working levels to handle the tonnage on single track and extract the ore at minimum cost.

In the mill, all the material from crusher and grizzlies of a size equal to the product of the disc grinder should at once be screened out. This would relieve considerably. From the disc grinder the ore, to prevent sliming, should be further reduced by rolls, any standard make, to not finer than 10 mesh, and the returned midlings not finer than 20 mesh. This will insure complete separation of gangue and minerals without sliming. By this coarse grinding, the product being all of a more size, better results will undoubtedly be gotten by the classifier. This will enable the tables to perform better work, and a higher grade and better amount of concentrates will result.

CONCLUSION:

You have a valuable mining proposition. The extent of the vein on the surface gives assurance of permanency in depth. The development work has shown large defined ore bodies and the work has been done in a workmanlike manner. The surface equipment is first class and up-to-date.

Respectfully submitted,
Carl Anderson, M.&Met. E.
Member Am. Inst. of E.M.
Member North of Engl. Inst.
of M. and Mech. Engineering

Signed

Since the above report was made by Mr. Anderson, shaft No. 2 has been sunk to the 400-foot level, a station cut at the 400-foot level, and a drift run to the north about 177 feet, in the foot wall, (not on the ledge). At this point a crosscut was started and from every indication the face of crosscut is near the ore shoot, No. 3 opened up above on the two hundred foot level.

Signed J. H. Hoffman

LIST OF MACHINERY & EQUIPMENT NOW AT
COPPERVILLE

May 23, 1940

- 1 - Ingersoll-Rand Type No. 10 Compressor 17 x 14 -- 10 x 14
- 1 - Dillon - Box Double Drum Electric Hoist, 82 H.P. driven by an 82 H.P. Induction Motor. (with cable)
- 1 - Induction Motor G.E. 120 AM Volts 440 - 100 H.P.
- 1 - 1-50 foot steel Gallus frame
- 2 - Mine shaft cages
- 5 - Mine cars
- 6 - Large corrugated iron tanks
- 1 - Allis Chalmers Co., Gates Giratory Crusher "D"
- 1 - Hargind 8-foot Pebble Mill
- 1 - Wagner Mfg. Co. Motor 50 H.P. 440 volts 59 Am.
- 2 - Web- City Rolls 16 inch face
- 1 - 24 inch Symons Disc Crusher
- 2 - 150 H.P. Meitz and Weiss Hot Head Oil Engines, directly connected to two 100 K.W. A. 3 cycle Westinghouse generators.
- 1 - 1 10 K.W.D.C. Generator and transformer

Power equipment in bad shape

- 1 - 12 H.P. Wetsern Gasoline Hoist
- 1 - Electric Motor H.P.
- 1 - Milling Building 120 x 50 feet, all steel structure, concrete floors.
- 1 - Power House, Steel Structure, concrete floor.

The buildings were covered with galvanized iron, but most of it is stripped and taken off by thieves, as well as all other equipment is stolen except the above list of machinery and equipment which is still in place.

RESOURCES

grounds

IA



RETURNED TO SENDER

REASON CHECKED

Unclaimed
Unknown
Insufficient
Moved, Left no address
No such office in state
Do not remain in this area
POSTAGE DUE 2 CENTS

Mr. Leonard Hoffman

Box 814

Kingman, Arizona

ARIZONA DEPARTMENT OF MINERAL RESOURCES
MINERAL BUILDING, FAIRGROUNDS
PHOENIX, ARIZONA

August 20, 1958

To the Owner or Operator of the Arizona Mining Property named below:

Siamese Group(Copperville)(Mohave County)	lead, zinc, copper, silver and
(Property)	(ore) gold

We have an old listing of the above property which we would like to have brought up to date.

Please fill out the enclosed Mine Owner's Report form with as complete detail as possible and attach copies of reports, maps, assay returns, shipment returns or other data which you have not sent us before and which might interest a prospective buyer in looking at the property.

Frank P. Knight

FRANK P. KNIGHT,
Director.

Enc: Mine Owner's Report

ERAL RESOURCES

izona

Fairgrounds

IZONA



REASON CHECKED
Unclaimed ☒ ☐ ☐
Unknown ☐ ☐ ☐
Insufficient address ☐ ☐ ☐
Moved, left no address ☐ ☐ ☐
No such office in state ☐ ☐ ☐
Do not re-mail in this envelope ☐ ☐ ☐
POSTAGE DUE 2 CENTS

Mr. M. B. Dudley
The Leviathan Molybdenum Mine
P.O. Box 534
Kingman, Arizona

ARIZONA DEPARTMENT OF MINERAL RESOURCES
MINERAL BUILDING, FAIRGROUNDS
PHOENIX, ARIZONA

August 27, 1958

To the Owner or Operator of the Arizona Mining Property named below:

Copportunity (Mohave Co.)
(Property)

copper
(ore)

We have an old listing of the above property which we would like to have brought up to date.

Please fill out the enclosed Mine Owner's Report form with as complete detail as possible and attach copies of reports, maps, assay returns, shipment returns or other data which you have not sent us before and which might interest a prospective buyer in looking at the property.

Frank P. Knight

FRANK P. KNIGHT,
Director.

Enc: Mine Owner's Report

Hoffman

December 19, 1946

Mr. Leonard Hoffman
Box 814
Kingman, Arizona

Dear Mr. Hoffman:

Thank you for the reports submitted
on the Siamese Group.

We will be glad to refer these reports
to anyone interested in a property such as yours.

Yours very truly,

Chas. H. Dunning
Director

CHD:lp

DESCRIPTIVE REPORT ON THE SIAMESE GROUP OF CLAIMS

By

Carl Anderson, Mining & Metallurgical
Engineer.

- - - - -

LOCATION AND GENERAL CONDITIONS:

The Company's property is located on the east slope of the Hualpai Range of mountains, in the Cedar Valley Mining District, Mohave County, Arizona.

The property is reached by a 25 mile wagon road from Yucca, a station on the main line of the A. T. & S. F. R. R. The road, which was constructed by the Company at considerable expense, crosses the range at an elevation of about 5200 feet, with an average grade of ten per cent over the mountains, and 5-ton loads are hauled from Yucca, elevation 1840 feet, to the camp in 6 to 8 hours, making comparatively cheap transportation.

The elevation at the mines is around 4500 feet, giving an ideal climate for all year round work.

Except in a few small basins, there is no timber on the range, but crude oil can be laid down at the mine at a reasonable price, giving cheaper and better power than wood under the best conditions. The mining requires but little timbering. The water supply is abundant.

THE MINING DISTRICT:

While practically no mining has been done on the west slope of the range, the east slope is one continuous mineral belt for the entire length of the range, a distance of about 30 miles, and continues south to the McCracken Mountains. The Company's mines are in the center of this belt. The district presented considerable activity in earlier days, in places where special geological and mineralogical conditions had caused a surface concentration in the silver values, and when silver was high. In general, however, the veins are all very much alike.

The general character is a vein filling of quartz carrying gold, silver, lead, copper, zinc and iron, the difference being in the predominance of one of the metals in the different mines.

The inaccessibility of the district, scarcity of wood for fuel, and want of proper metallurgical process, has kept this district back, but now with the advent of the motor truck, the development of the California oil fields, and improved methods of concentrating by oil flotation and separation, the transportation, fuel and treatment problems have been solved, and the district should become one of the foremost mining centers of the United States, as all interests are now tending to the exploitation of large permanent propositions rather than the temporary bonanza mining.

PROPERTY:

The mining property consists of nine patented claims, a total of about 176 acres. Of these claims the five Siamese claims and two Pittsburg claims are located on one vein, the other two claims being located on spurs which belong to the same vein system.

GEOLOGY AND VEIN FORMATION:

The range is built up of coarse-textured granitic rocks of volcanic origin of a comparatively late period, probably Post-Cretaceous.

It exhibits all the usual characteristics of an intruded granite. No distinct folding was observed, and possibly none exists. It shows in numerous places the action of magmatic segregation of separate bands of hornblende, feldspar, and quartz. This segregation took place while cooling, the segregated sheets showing the flow lines.

Other features are in the occurrence of barren glassy quartz veins, due to differentiation of the crystallizing magma, or perhaps to lateral infiltration, filling shrinkage cracks. The granite is sheeted, the jointing planes are mostly well apart, so that it weathers to large rounded boulders. The only other alteration observed, due to hydro-thermal action in connection with the vein filling, is not noticeable on the surface, and evidently does not extend but a short distance from the veins. The granite is of the light colored acid variety, consisting mainly of quartz and pink orthoclase.

Of far less extent, but of greater importance, are the intruded dikes of diorite cutting through the granite. One in particular was examined. It crosses the north end of Side-line claim, from the north and east, and near the north and center of Siamese No. 2, turns south and east, varying in width from 20 to 150 feet. It is along this contact that the vein is formed.

The diorite, when altered, is a hard, black, fine crystalline basic rock, which on weathering softens and has a dark green tint due to the hornblende which predominates. It shows no grading into, or transition form away from the vein, but underground in the vein the two rocks, both altered, in places grade into each other. After cooling, due to the strain formed in cooling, a fault-fissure was formed, which gave vent to the mineral-bearing thermal springs that followed volcanic eruptions.

The hard granite hanging wall shows by striation and slickensides the movement between the hard rocks to be at an angle of 45 degrees from the horizontal.

The fissure, in the main, followed the contact, though in places it cut through the granite close to the diorite, and again through the diorite close to the granite.

The vein was gradually built up. Each period of hydrothermal action enlarged and enriched the vein. Crosscut No. 4 on the hanging wall shows the structure of the ore to be symmetrical crusts, deposited in definite order as banded vein filling. That the vein was further faulted after forming is shown, for example, in the cut to the footwall above Crosscut No. 7, where sharp cornered pieces of quartz from the vein are found in the gouge or attrition clay formed by movements along the wall. Many other features were observed, but are beyond the scope of this report.

The vein formation representing different periods, the character of the ore deposited probably also changed somewhat, so that the silver, lead and zinc represents one or several periods of deposition; the copper and gold probably other, though of course considerable intermingling took place; the copper replacing the iron as a secondary material. The mineral-bearing waters being acid (silicious) naturally affected the basic diorite far more than the said granite, on which it would have but little effect. The vein filling was then formed by metasomatic replacement of the diorite.

In parts, this replacement has been absolute, forming large bodies of mineralized quartz. This forms the main bodies of ore. In places the diorite has been only partly replaced, making a silicified diorite well mineralized, of lower grade, but of milling value; and again the diorite can be found unaltered, only showing quartz seams through it. This occurs sparsely as "horses" in the ~~xxx~~ vein.

As stated, the alteration of the granite has been but slight. In crosscut No. 12, where the fault fissure cuts partly through the granite, the cracks between the

crushed rocks have been filled with solid galena and zincblende, testifying to the richness of the mineral-bearing solutions. These seams, which show as a fine network through the entire granite mass within the vein, are in places several inches wide, making a good milling ore. In the main drift, where it crosses the vein from foot to hanging wall, the magmatic segregation of the granite caused by the contact with the molten diorite can be observed.

THE VEIN AND ORE SHOOTS;

The principal vein, and the only one exploited to any extent, is covered by seven patented claims, a total of 10,500 feet on the vein. It can be followed the entire distance by its outcrop, and where developed, has been found to correspond to the showings underground.

The ore bodies have strong, prominent outcrops, forming the crest of the hills, due to the massive quartz having protected the softer country rock from erosion.

Four separate ore shoots have been proven:

No. 1, about 200 feet long, from 4 to 8 feet wide, developed by main drift to a depth of 300 to 400 feet in the south end of Siamese No. 1, north of Shaft No. 1.

No. 2, about 300 ft. long, from 8 to 14 ft. wide, developed by main drift to a depth of from 130 to 200 in the center of Siamese No. 2.

No. 3, about 350 ft. long and 14 to 30 ft. wide, developed to an average depth of 160 ft. by main drift, at south end of Siamese No. 2, near Shaft No. 1.

No. 4, from surface showing about 400 ft. long, and from 15 to 30 ft. wide, developed by tunnel No. 2 for about 200 ft. It is on the south end of Siamese No. 3, and north end of Siamese No. 4.

This would make, then, after deducting 10 ft. of almost entirely leached surface ore, a total of about 2,000,000 cubic ft. or 150,000 tons of ore, above present workings, which, with adequate mining and milling facilities, can be worked at a profit. Each additional 100 feet in depth would aggregate for the four shoots, about 125,000 tons.

The impoverishing of the vein through leaching by acid surface waters has been great. The oxidation of the pyrites caused the formation of sulphuric acid, which disclosed the copper, which probably already had been partly altered to oxides and carbonates. This leaching is still going on, as can be seen in tunnel No. 1 where crystalline tufts of Chalcanthite, or native sulphate of copper, are still forming. The effect on the zinc and lead sulphides has been less, so these are the predominant minerals in the mine at present depth. There is then good reason to expect a material increase in copper values at permanent water level. Where found unaltered in the solid quartz the mineral gave by analysis 28.4% copper, and 36.4% iron, corresponding to bornite with a small per cent of pyrite. In Butte, Montana, the large copper deposits are the result of leaching and re-precipitation of large bodies of vein matter carrying 1% and less in copper. The formation of sesquioxide of iron, a solvent of gold, (Report U.S. Geological Survey), may equally have affected the gold values. Indications from copper stain, decomposed vein matter, are that the copper will favor the footwall side of the vein.

WATER LEVEL;

From the comparative rapid decrease of oxidized ore, from the surface to the main drift, a distance of 200 ft. at shaft No. 2, there is reason to expect the permanent water level in a short distance; probably another 400 ft. will reach it.

MINE DEVELOPMENT:

The main development work has been done on the Siamese Nos. 1, 2, and 3. On Siamese No. 1, a double-compartment shaft, 5 x 9 ft., was sunk to a depth of 305 ft. At 285 ft. drifts were driven north and south on the vein, to the north a distance of 600 ft., attaining a depth of 470 ft. Tunnel No. 1 was run a distance of 200 ft. on the ledge, intersecting the shaft at a depth of 80 ft. and continuing beyond the shaft for about 500 ft.

From the 285 ft. station, the level was driven south about 950 ft., following most of the distance the hanging wall. Between crosscuts 13 and 12, the drift cuts from the hanging wall to the footwall.

Shaft No. 2, a 5 x 15 foot, 3 compartment, vertical shaft, was started on the hanging wall side of the vein, crosses the vein, and the bottom at 222 ft., is in the footwall. At a depth of 205 ft. a drift was driven north, connecting with the south drift from shaft No. 1, making 1536 ft. on the vein between shafts, with 17 crosscuts from 10 to 40 ft. in length. The drift south from Shaft No. 2 is 224 ft., making 2360 ft. continuous on the vein.

Tunnel No. 2 on Siamese No. 3 and 4 is about 500 ft. long, 200 ft. being driven on the footwall side of a well mineralized ore shoot, No. 4 attaining a depth of 220 ft. This tunnel is about 100 ft. higher than the collar of Shaft No. 2, and the mouth of the tunnel is about 1000 ft. south of the shaft.

Besides these workings, there are numerous cuts, shallow shafts, etc., making a total of more than one mile of underground work. As can be seen from this description, only ore shoots Nos. 2 and 3 can be worked at present to advantage from Shaft No. 2, and from shoot No. 1, it would be over 1500 ft. upgrade tramming, which is impractical. From Shoot No. 4 there is no connection with the shaft.

At the 200-foot station of this shaft is a 16 x 16 x 16 ft. sump for collection of mine water, into which flows the water pumped from the sump at shaft No. 1.

THE ORE AND ITS VALUE:

The ore as referred to in several places in this report is a white crystalline quartz carrying gold, silver, copper, lead, zinc, and iron. Small amounts of antimony and arsenic is found by analysis, and as much as 4/10ths per cent of bismuth in the concentration.

The principal minerals are galena, carrying silver, zincblende, bornite (copper-iron sulphide) and pyrites. The minerals are within certain zones fairly evenly distributed throughout the quartz, and while streaks and bunches of solid mineral is encountered, the ore does not occur in a way as to make the sorting out of shipping ore practical. It is strictly a concentrating ore. No barite (heavy spar) is found, so a product clean from gangue material can be obtained. The different minerals have intergrown, which led to the erroneous idea that fine crushing was necessary. But as the crystallization is fairly coarse, the minerals separate readily along the crystal faces.

In metal values, silver is first, lead next, then zinc, copper, and gold. The possibility of copper predominating in depth has been referred to.

It can be readily seen that in a vein of this size and genesis, the value of the ore depends entirely upon with what selection the ore is mined, and this selection again depends upon physical conditions in the mine, capacity of mill, etc. The assay records give numerous and various values for samples taken from different parts of the mine. To obtain as representative a sample as possible, samples were taken at regular intervals in the mill for five days during the examination. The mill was

running one 8-hour shift per day, no more water being available, so the sample represents approximately 200 tons milled. As the ore was drawn by chutes from the stopes in the mine, and there are several thousand tons broken in the stopes, the sample may be considered to represent this tonnage. The average of the assays and analysis gave:

Gold 0.01 oz., silver 5.01 oz., lead 2.6%, copper .25%, zinc 4.3%. The total metal value, at present market prices, would be \$10.54. Based on the price paid by the smelters, which is 55¢ per oz. of silver, lead $3\frac{1}{2}$ ¢, zinc $3\frac{1}{2}$ ¢ and copper 10¢ per pound, the ore has a value of \$8.15 per ton. To obtain these prices, a fairly clean separation of the zinc from the other metals must be made, but this the mill should and can do. The silver is almost entirely combined with the lead, at the ratio of 2 ounces of silver to each per cent of lead. That high-grade concentrates can be readily made was demonstrated by cutting out samples from the tables while operating. Assays gave gold 0.30 oz., silver 123.2 oz., lead 59.8%, having a value of \$112.63 on above metal valuation.

The mill is yet in an experimental stage. The classification is far from perfect, so that the subsequent separation on the tables is very unsatisfactory. For this reason, two products are now being made. One a shipping product, carrying 60 oz. silver and 30% lead, value \$52.50, and a mixed product of lead, zinc, and copper, which is being stored. A high per cent of saving on this ore should be made, 85% or better. One of the great difficulties is the sliming of the minerals, due to fine grinding. Tests showed that 70% of the values of the ore were in the pulp finer than 100 mesh. Crushing to 1 mm. or 20 mesh is ample, as it gives a perfect separation of gangue and mineral. The mill, with the exception of the Hardinge Mill, has a capacity of 360 tons per day.

RECOMMENDATIONS:

No time should be lost in placing the property on a dividend paying basis. Shaft No. 2 should be sunk another 200 ft., preferably deeper, and levels driven north each 100 ft. to develop ore shoots Nos. 2 and 3. At the 400 ft. station, the drift should also be driven south to exploit ore shoot No. 4. At this depth, the drift would be 500 ft. below tunnel No. 2, and 700 ft. below the apex of the vein. As far as surface showings, No. 4 shoot gives better promise than Nos. 1 and 2, and equals No. 3, the replacement of the diorite having been complete. On the main drift in shoot No. 3 it should be, in a crosscut or two, ascertained if the diorite showing as hanging wall is the true wall. Shoot No. 2 could be further exploited to advantage in crosscut No. 12 by a raise, on account of the rich seams in the granite. It is paramount that the shaft should be sunk, not only for the increase in water supply, which undoubtedly will be heavy, considering the increase for the distance sunk, but it would require two or three working levels to handle the tonnage on single track and extract the ore at minimum cost.

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CONCLUSION:

You have a valuable mining proposition. The extent of the vein on the surface gives assurance of permanency in depth. The development work has shown large defined ore bodies, and the work has been done in a workmanlike manner. The surface equipment is first class and up to date.

Respectfully submitted,

Dated February 14, 1914.

(Signed) Carl Anderson, M. & Met. E.,
Member Am. Inst. of M. E.,
Member North of Engl. Inst. of
M. & Mech. E.

- - - - -

Since the above report was made by Mr. Anderson, Shaft No. 2 has been sunk to the 400-foot level, a station cut at the 400-foot level, and a drift run to the North about 177 feet. In the footwall (not on the ledge) at this point a crosscut was started, and from every indication the face of crosscut is near the ore shoot, No. 3, opened up above on the two hundred foot level.

(Signed) J. H. Hoffman.

Dated March 24, 1942.

SHATTUCK DENN MINING CORPORATION
and
SUBSIDIARIES

Humboldt Office

Date June 29, 1966

TO: C. R. Sundeen

SUBJECT: HOLLINGSWORTH PROPERTIES ✓
% E.L. Hollingsworth
P.O. Box 945
Wickieup, Arizona

FROM: J. Olaf Sund

TYPE: Lead-silver

TERMS REQUESTED:

Hollingsworth wishes to ship ore to the Iron King after a cash advance to get him started (?).

LOCATION:

The various properties held or located by Hollingsworth are mostly northwest, west and southwest of Wickieup. They are all old past producing mines and include such current names as Lucky Penny, Silver Dollar, Royal Blue, Luck Day, Hard Day, Gold King (formerly Spanish Arastra), and Copperville etc.

The two properties examined by the writer and considered as a representative cross-section are the Copperville and the Hard Day. The former is located along the common boundary of Ranges 14 and 15 West in Township 17 North. The latter is only approximately established but probably in Township 16½ North and Range 14 West.

These two groups of claims are tied-onto two sides of a considerable parcel of ground that is currently held by Arkla Exploration Co. (Arkansas and Louisiana Gas Co.). An extensive diamond drill program is in progress for Arkla which is being done by Boyles Bros.

GENERAL GEOLOGY:

The entire area to the west of Wickieup is underlain by a variety of granitic rocks that make up the Hualapai Mountain Range. These include distinctly intrusive granites of Precambrian and Tertiary (?) age as well as a very widespread granite gneiss, also of Precambrian age. The latter gneisses are all greyish, medium-grained, quartz-feldspar-biotite types and are characterized by the normal foliation. Although the evidence was not clear, it is believed that they consist of both orthogneiss and the included paragneiss.

Quartz veins of varying sizes and orientations have intruded into the gneissic rocks along joints, faults or shears and in places the foliation. The quartz is generally a pure white glassy variety that frequently carries galena, some sphalerite and silver, some of which is in the free state.

PROPERTY GEOLOGY:

These quartz veins have been the subject of considerable mining efforts, most of which probably date around the 1900's. It is on these old mines that Hollingsworth has located claims. He now wishes to ship the rock from the numerous mine dumps to the Iron King.

Re: Copperville property. Two shafts with dumps that should contain approximately 90,000 tons of rock combined as well as two adits with smaller dumps all intersected and mined along a 5 foot wide sheared zone that contained irregularly mineralized quartz veins. The orientation at this property is north 40 degrees west and the dip is vertical.

The following samples were collected from the mine dumps and assayed:

Sample No.	Description & Location	Au	Ag	Pb	Zn	Cu
12385	x-sect.1, top 12 ft. (1st Dump)	0.03	0.5	0.6	0.7	0.08
12386	" Mid 12 ft	Tr	0.3	0.2	0.3	0.08
12387	" bottom 12 ft.	0.02	0.3	0.22	0.4	0.07
12388	x-sect.2 top 12 ft.	Tr	2.5	1.0	3.6	0.12
12389	" mid 12 ft.	Tr	2.0	1.6	3.3	0.12
12390	" bottom 12 ft.	Tr	0.3	0.2	1.2	0.08
12391	x-sect.3 top 12 ft.	0.02	0.4	0.2	0.1	0.07
12392	" mid 12 ft.	Tr	0.3	0.2	0.9	0.08
12393	" bottom 12 ft.	Tr	0.7	0.3	0.5	0.14
12394	x-sect.4 top 12 ft.	Tr	0.01	0.7	Tr	0.06
12395	" bottom 12 ft.	Tr	Tr	Tr	Nil	0.02
12396	selected quartz-top of dump	Tr	1.7	0.80	1.3	0.05
12397	" " " " "	Tr	2.6	1.6	1.5	0.22
12398	concentrates: middle bin	0.04	21.3	11.4	16.9	0.94
12399	" south bin	0.05	8.0	3.2	22.5	1.60
12400	" north bin	Tr	7.9	3.0	23.4	1.7
12851	face: mid adit: 2 ft. quartz	Tr	4.8	2.5	0.3	0.5
12852	" " 2 ft. quartz	Tr	2.4	4.6	0.3	0.12
12853	x-sect.1, top 12 ft. (2nd dump)	Tr	0.3	0.4	0.2	0.10
12854	" mid 12 ft.	0.01	1.4	2.2	1.5	0.7
12855	" bottom 12 ft.	Tr	0.5	0.5	0.4	0.12
12856	x-sect.2, top 12 ft.	Tr	0.3	0.3	0.4	0.06
12857	" Mid 12 ft.	Nil	0.3	0.30	0.60	0.10
12858	" bottom 12 ft.	0.02	Tr	0.20	0.60	0.10
12859	x-sect.3, top 12 ft.	Tr	Tr	Nil	Tr	0.06
12860	" bottom 12 ft.	Tr	Tr	Nil	Nil	0.06

Re: Hard Day property. This is apparently fairly typical of the many other properties, of which Hollingsworth has control. A modest effort to mine the above quartz veins has resulted in only a limited quantity of rock on the dumps. The orientation of the vein here is at north 5 degrees west and has an 80 degree easterly dip. The vein is 2 to 5 feet wide and contains some galena chalcopryrite and silver. The host is massive granite. Other parallel veins some 100 feet away are 12 to 18 inches wide and are probably moderately mineralized although they were not opened up.

Samples collected were assayed as follows:

Sample No.	Description & Location	Au	Ag	Pb	Zn	Cu
12861	Qtz from dump with lead & copper	0.06	6.8	1.1	0.1	0.22
12862	" " " " " " " "					
12863	" " " " " " " "	0.08	6.8	1.2	0.6	0.24
12864	2nd vein-quartz #1	0.05	4.0	0.1	Nil	0.12
12865	" quartz on strike	Tr	Tr	0.6	0.10	0.12
12866	" " " "	0.05	3.8	0.2	0.01	0.20
12867	" " " "	0.02	17.6	0.6	Nil	0.58
12868	" " " "	Tr	3.1	0.2	Nil	0.28

SUMMARY:

It is immediately apparent from the assays of samples taken on the main dump at the Copperville property that the overall grade is not significantly high. In fact, the crude average grade for the 90,000 tons of rock would be only \$3.40 per ton on the basis of the above sampling. Even the limited collections of selected "high-grade" rocks only averaged \$5.60 per ton.

Samples from the dump of the Hard Day property indicate an average grade of \$10.98. However, such higher grade rock is very limited. Hollingsworth has pointed out that most of his other properties have the same limited quantity of rock in the dumps.

Special note should be made to the 3 samples taken from 3 separate bins of concentrates at the Copperville mine. There is probably about 10 tons of such material with an arithmetic average grade of \$46.10 per ton.

CONCLUSIONS:

The old Copperville mine together with the long list of properties owned by Hollingsworth are probably all geologically nearly identical. They are characterized by narrow discontinuous quartz veins that occupy shears and joints in a granitic gneiss. The veins may carry anomalously high silver with lead and zinc mineralization.

Mining such veins can be considered on only a small "high-grading" basis. Thus it is recommended that Shattuck Denn show no interest in an option on any of the many properties involved.

Custom milling the rock dumps from the ancient mining cannot be considered because of the general low grade involved. However, if only the higher grade parts of the various dumps were carefully selected, a \$10.00 rock might be possible. This would, of course, limit the actual tons available for milling. Henry Swanson has pointed out the difficulty in custom milling quartz rock with such a high silver content in that much can be quickly lost. Therefore, such a proposal of the limited scope involved does not appear to be feasible.

The approximate 10 tons of concentrates on the other hand carry high percentages of lead and zinc. If a reasonable price can be arranged this might be an opportunity for a limited but instant profit.

Hollingsworth's title to the Copperville property would have to be verified first. He does not appear to be the most dependable type of citizen.

Dump: 75'x40'x(0 to 130')

12859
12860

12856
12857
12858

12853
12854
12855

Distance approx
1500'

12851
12852

12394
12395

12391
12392
12393

12396
12397

12388
12389
12390

12385
12386
12387

Concentrates: 12398
12399
12400

Dump: 132'x84'x(0 to 100')

SAMPLE LOCATIONS FROM MINE DUMPS
COPPERVILLE PROP.

(HOLLINGSWORTH PROPERTY)

SUMMARY

Copperville Mine comprises nine patented claims located 20 miles northwest of Wickieup, Arizona.

The principal vein is evident by outcrop for a length of 10,500 ft. and where developed has been found to correspond to the showing underground. Mill run ore assays \$27.45 per ton, silver 5.01 oz/ton (\$6.50); lead 2.6% (\$7.30); zinc 4.3% (\$12.50); gold 0.01 oz/ton (0.35); Copper 0.25% (\$1.80).

Leaching displacement of surface copper by iron is evident in the 200 foot tunnels which strongly indicate substantial increases in the copper values at water level possibly 600 feet deep. Where found unaltered in quartz the copper mineral assayed 28.4% copper and 36.4% iron.

Four ore shoots contain a proven 150,000 tons of ore (\$4,000,000) to a depth of 100 to 300 feet and each additional 100 feet of depth contains a further 125,000 tons of ore (\$3,500,000.).

The extent of the vein on the surface gives assurance of permanency in depth.

Mining and processing are estimated to cost \$10.00 per ton which would yield a pretax profit of \$4,360,000 at a 1000 ton per day operating rate. A relatively simple mining and processing installation should produce a 15:1 concentrate at 90 - 95% recovery with a shipping value of \$375. per ton. Capital cost of mine and mill for this capacity should not exceed \$2,000,000.

Fifty thousand tons of tailings suitable for reprocessing are estimated, based on sampling to have an average value of \$15.00 per ton for a net recovery value in the range of \$500,000.

In the early 1900's \$750,000 was spent on the property to sink two shafts of 305 feet and 222 feet depths with over one mile of underground drifts and tunnels. Low market value of the metals plus wagon transport and lack of fuel prevented continued operation.

The Copperville property is a well proven mineral deposit in the east slope of the Hualapai Mountain range which is a continuous 30 mile mineral belt.

The Copperville claims are in the middle of the belt.

Good roads, motorized transport, low cost oil fuel, modern mining and mineral recovery will make this property an outstanding mineral producer and profitable operation.

MISCELLANEOUS ASSAYS

Sample Designation	Gold oz/T	Silver oz/T	Lead %	Zinc %	Copper %
West Tunnel	0.08	23.0	11.0	Tr	0.34
4117	Tr	2.5	0.7	1.1	NR
4118	.02	1.0	0.8	0.5	NR
4119	.02	7.0	2.9	0.2	NR
4120	.02	16.5	19.5	7.7	NR
4121	.04	49.5	18.3	6.8	NR
4122	-	115.7	41.5	0.8	NR
Vein Surface #3	.05	3.7	5.6	2.1	1.18
Vein Surface #4	-	0.9	1.6	1.3	-
#4	Tr	0.3	-	-	0.22
5	.01	0.7	-	-	1.66
6	.06	16.8	4.3	1.3	1.86
Concentrates	2.10	21.67	13.76	3.90	3.39
4140	-	3.0	1.4	0.9	-
4141 (Conc)	Tr	66.5	33.75	4.3	0.60
4142	.04	57.6	26.80	5.10	0.25
4143	-	50.8	23.80	5.0	-
4144	-	39.2	22.0	6.9	-

*

ECONOMICS

BASIS: 1000 Tons of ore per calendar day

Ore Assay: 5.01 oz. Silver; 2.6% Lead; 43% Zinc; 0.25% Copper;
0.01 Gold

Metal Value \$27.45 per ton

Mining & Milling Cost \$10.00 per ton

Concentration Ratio 15/1

Concentrate production 67 tons per day

Mill recovery 90% of minerals

Smelter Settlement 80% of metal value

Income: Smelter settlement Dollars/Year

1000 TDX 27.45 \$/T x 0.80 Rec. x 365 D/Y = 8,040,000

Expenses

1000 TD x 10.00 \$/T M&M x 365 D/Y = 3,650,000

Profit before depreciation, depletion, taxes \$ 4,390,000

Capital Cost

Mining facilities 500,000

Milling facilities 1,500,000

2,000,000

Depreciation basis 10 years 200,000

4,190,000

Depletion 15% of 8,000,000 1,200,000

Taxable Income 2,990,000

Income Tax 48% 1,440,000

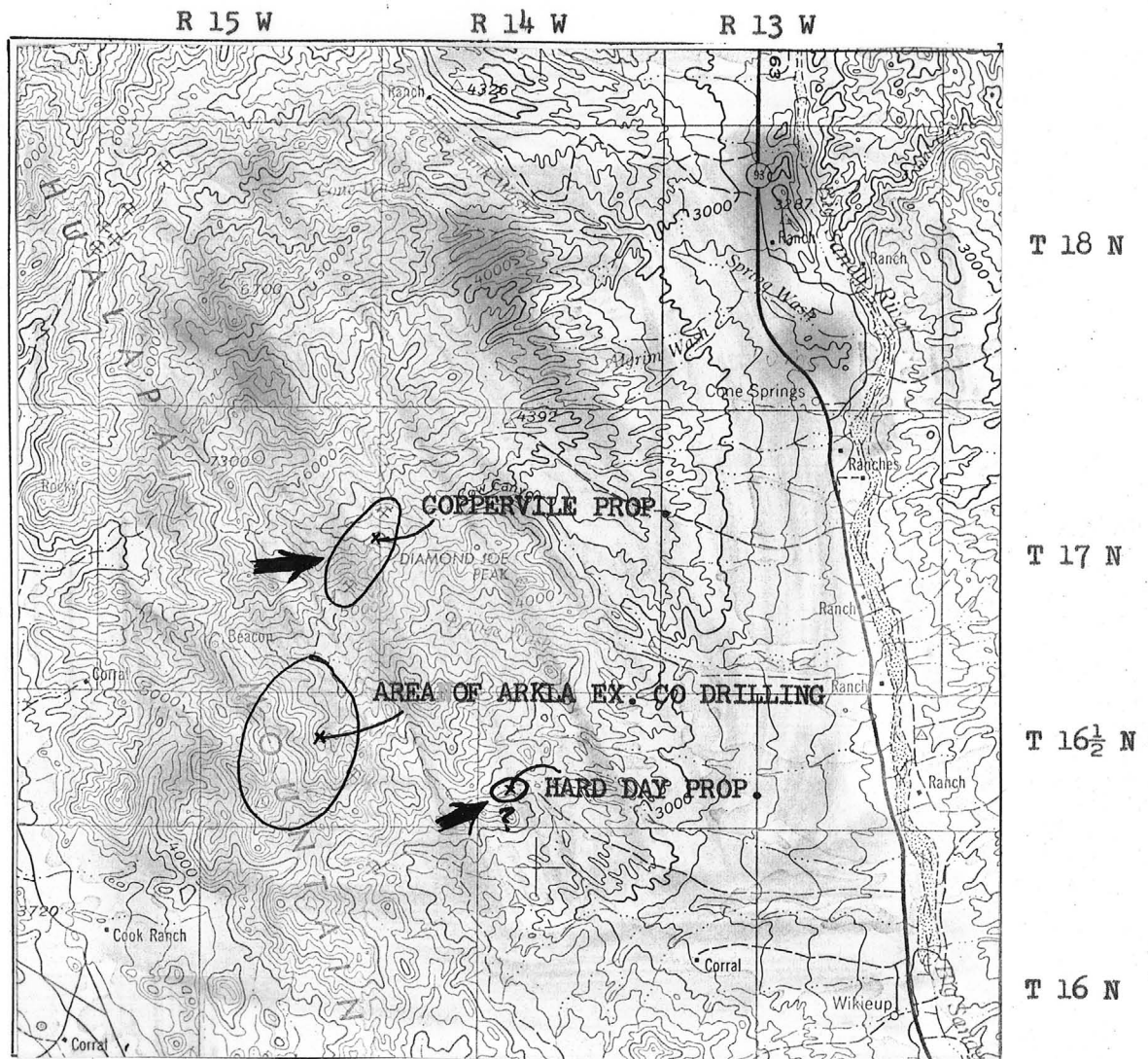
After tax income \$ 1,550,000

Depletion Income 1,200,000

Net Income per Year \$ 2,750,000

$\frac{2,750,000}{2,000,000} = 138\%$ return on capital/yr.

*



LOCATION OF HOLLINGSWORTH PROPERTIES

Scale 1 : 250,000