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See photo collection

Silver Hill File

TENNESSEE MINE

Chloride District Mohave County, Arizona

The Tennessee is the other good mine more or less completely exploited in the Cerbat range.

The Production Bulletin credits the mine with a production of 5,500,000 dollars in lead, silver, zinc and gold. The tonnage from the main Tennessee shoot is estimated at about 250,000 tons. The present operators (Sunshine Mine of the Couer D'Alenes) mined a northward extension of the Tennessee shoot and are operating on a separate shoot on the Schuylkill claim.

The local people state that the mine has produced about 18,000,000 dollars in metal. This seems excessive but the Arizona Production Bulletin total is probably low. It seems likely that the mine produced around 10,000,000.
The ore probably carried about .05 Au; 5 to 6 oz silver, 8% Pb, 5% Zn, .25% Cu. Some remarkably rich galena was stoped by the US S& & R& Co.

The Tennessee ore shoot was a big lense that raked down to the NW from the surface to about the 1400 or 1500 level. The old stope maps indicate a length on drifts of about 400 feet. Several levels showed pinching, in fact the shoot comprises a number of lenses of ore separated vertically and horizontally by pinches. The values largely filled open spaces along the fracture.

The ore is localized according to S. K. Garrett, geologist of the Tennessee, by changes of strike and dip. The best shoots occur where the strike swings slightly more northerly than the average concidentally with a steeepening of dip. The ore shoot in the Tennessee is said to be very poor in the lower levels due to a flattening of the vein. Garrett says the nature of the rock traversed had no effect on ore shoots.

The minerals in the vein comprise quartz, galena, sphalerite, pyrite of two types. The big quartz veins seen in other parts of the district are not prominent in the Tennessee vein where the ore shoots were seen. The ore occurred in rich streaks in a shear zone about 3 to 4 feet wide.

Gold runs with a bronzy looking pyrite that occurs rather sparingly and sporadically in the vein. Ordinary pyrite is common and locally abundant.

Lead is said to be decreasing in depth though rich lead was seen on the 900 level. A remarkable zoning is described by Garrett as occurring along the stopes horizontally. Beginning at one end of a shoot, a vertical or steeply raking zone of high gold ore is encountered, followed by another zone high in zinc, which is turn followed by a zone rich in lead, followed by a new sequence.

We saw the stoping on the 500 level on the Schuylkill claim. This lense of ore is of fair size and rakes steeply to the NW. It bifurcates upwards into two prongs. This ore is about 3 to 4 feet wide and is stoped by a modified square-set system. It runs about .25 gold, 4 oz Ag, 8% Pb, and 4 to 5% Zn.

The minor fractures seen breaking into the walls suggest that some movement to the left occurred. In cross-section, the occurrence of the ore suggests reverse movemnt on the fault.

An old assay map of the drifts on the Tennessee shoot gives the following grade: Au-.09, Ag-5.5, Pb-8.4%; Zn-20.1, Cu-.24% This average apparently does not represent the grade as actually mined. The averages given cover the 500 to 1170 levels inclusive.

The ore is said to concentrate well. The ground varies from heavy to moderately heavy. Blocked sections have slipped closing up the drifts beneath them.

The present mill has been operated at 175 tons per day but at present is reported to be handling 150 tons/day including some custom ore. The mine at present is operating mainly on the Schuylkill shoot carrying .25 oz gold.

It seems doubtful that the property will continue operations very long at present prices of lead and zinc (4 cents). Present operations are at the expense of higher grade ores, especially in gold, and probably cannot long continue.

The Tennessee is a factor in any new operation in the Chloride district because of having a mill ready and because of water supply. It seems that any new operation in the district must of necessity include the Tennessee.

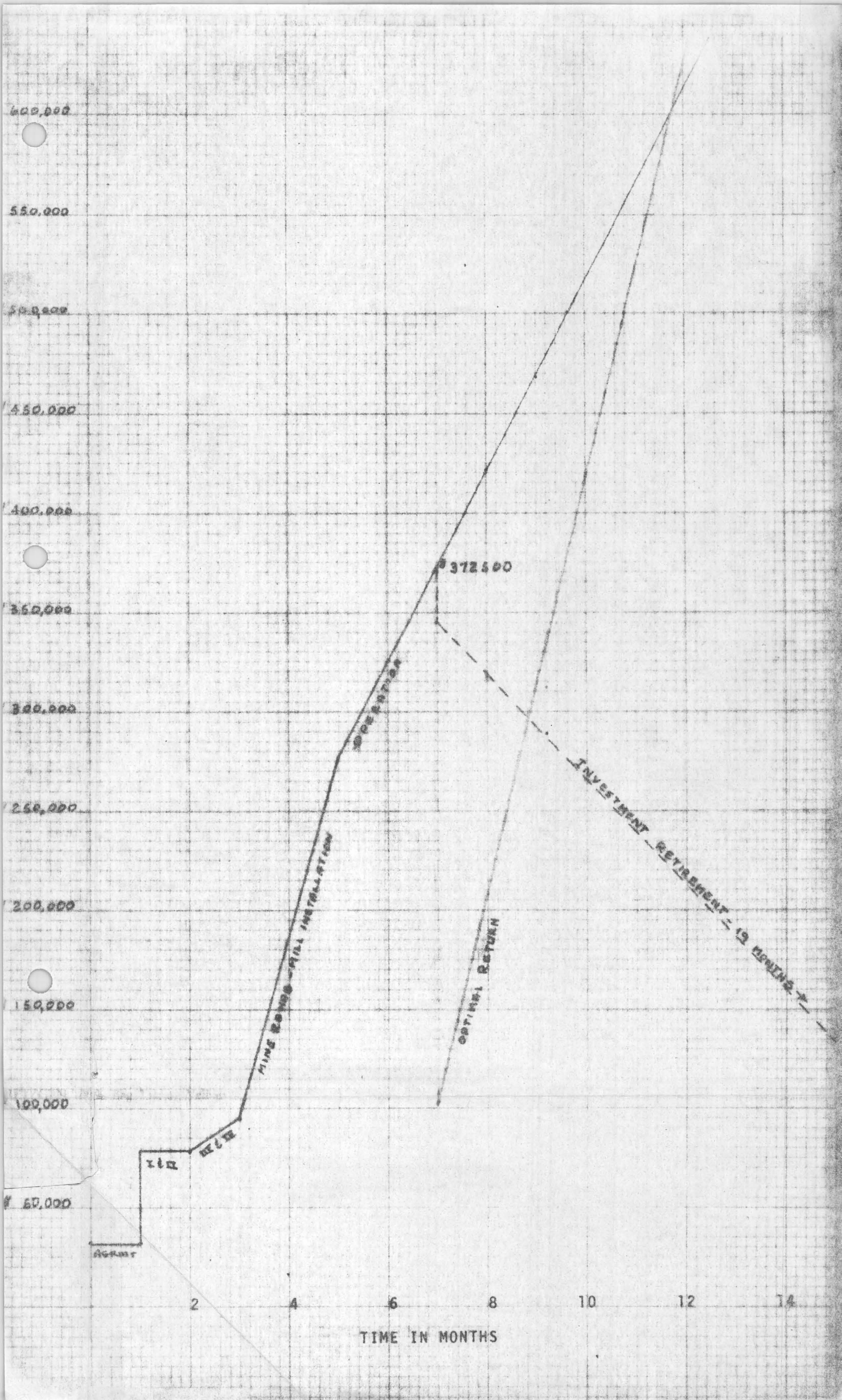
Visited: April 1, 1938

G. M. Fowler

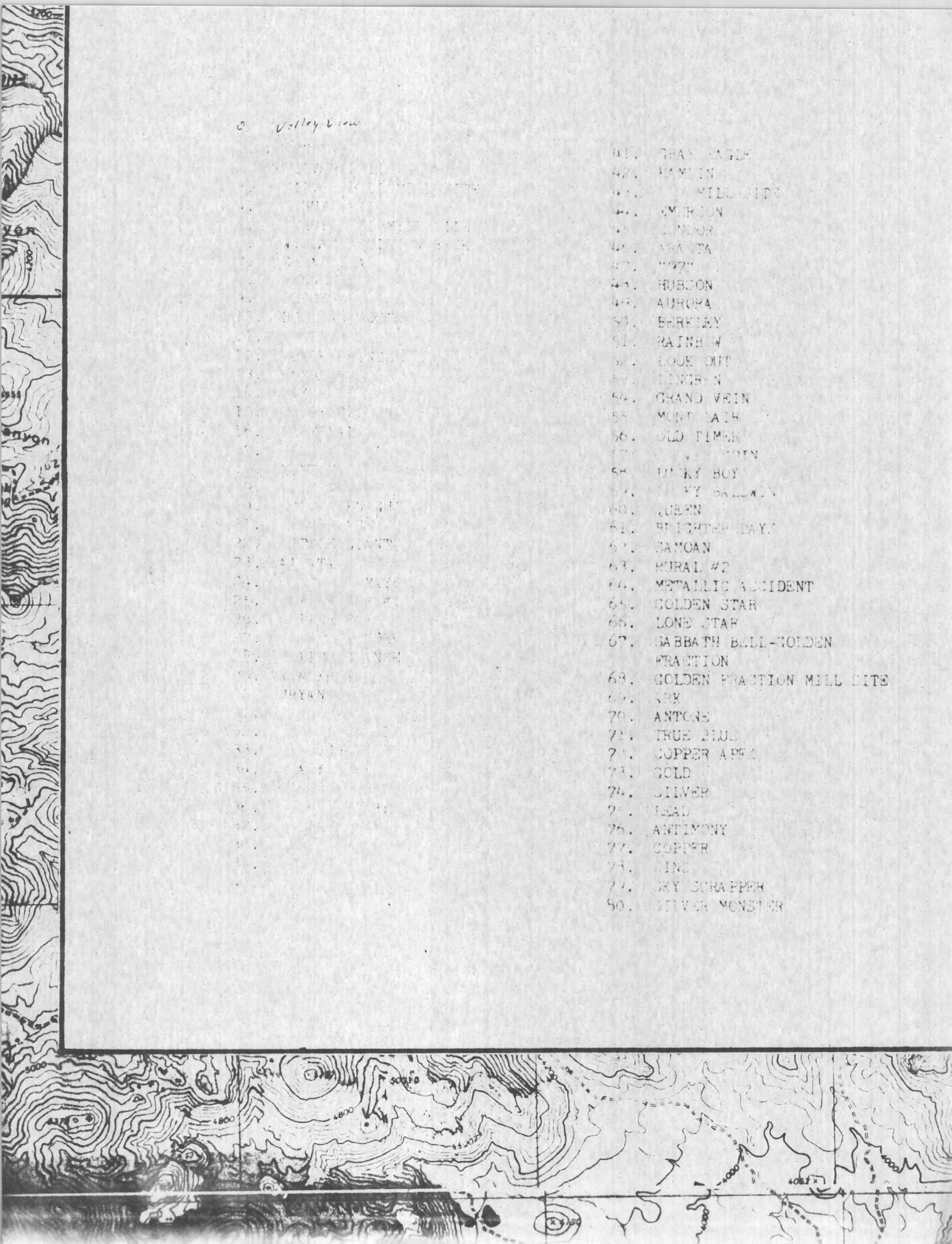
Robert M. Hernon

Robert M. Hernon

June 18, 1938


600,000
550,000
500,000
450,000
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
372,500
OPERATION
MINE BEHIND - FULL INSTALLATION
OPTIMAL RETURN
INVESTMENT RETIREMENT - 12 MONTHS
2
4
6
8
10
12
14
TIME IN MONTHS

0. Valley View
1. SONOMA
2. SILVER BELL
3. SILVER BELL MILL SITE
4. SCHUYL KIL
5. SCHUYL KIL MILL SITE
6. WILLACE-BULLION BECK
7. GREAT LEAD
8. TENNESSEE
9. PEGGY
10. BULLION SOUTH
11. BURLOCK
12. BLACK PRINCE
13. RAMBLER
14. PAY ROLL
15. MOLLY GIPSON
16. TERMINAL
17. JOHNNY BULL
18. MONTANA
19. ARIZONA
20. SILVER KNIGHT
21. SILVER AGE
22. LITTLE GIANT
23. ALTATA
24. CINCO DE MAYO
25. COPPER BAR #1
26. COPPER BAR
27. COPPER WONDER
28. COPPER GLANCE
29. WONDER
30. BRYAN
31. TOWNE
32. BUCKEY ONEIL
33. MIDNIGHT
34. READY CURE
35. PINKHAM
36. 20th CENTURY
37. RELIEF
38. WILLIAM
39. EMPRESS
40. SUPERIOR
41. GRAY EAGLE
42. HAMLIN
43. MILL SITE
44. EMERSON
45. CONDOR
46. ARASTA
47. "97"
48. HUBSON
49. AURORA
50. BERKLEY
51. RAINBOW
52. LOOK OUT
53. LINGREN
54. GRAND VEIN
55. MONTCLAIR
56. OLD TIMER
57. SILVER COIN
58. LUCKY BOY
59. LUCKY BALDWIN
60. QUEEN
61. BRIGHTER DAYS
62. SAMOAN
63. RURAL #2
64. METALLIC ACCIDENT
65. GOLDEN STAR
66. LONE STAR
67. SABBATH BELL-GOLDEN FRACTION
68. GOLDEN FRACTION MILL SITE
69. ARK
70. ANTONE
71. TRUE BLUE
72. COPPER APEX
73. GOLD
74. SILVER
75. LEAD
76. ANTIMONY
77. COPPER
78. ZINC
79. SKY SCRAPPER
80. SILVER MONSTER



o Valley View

41. GRAY EAGLE
42. HAMLIN
43. [illegible] MILL SITE
44. CAMERON
45. CONDOR
46. ANACONDA
47. "97"
48. HUDSON
49. AURORA
50. BERKELEY
51. RAINBOW
52. LOOK OUT
53. [illegible]
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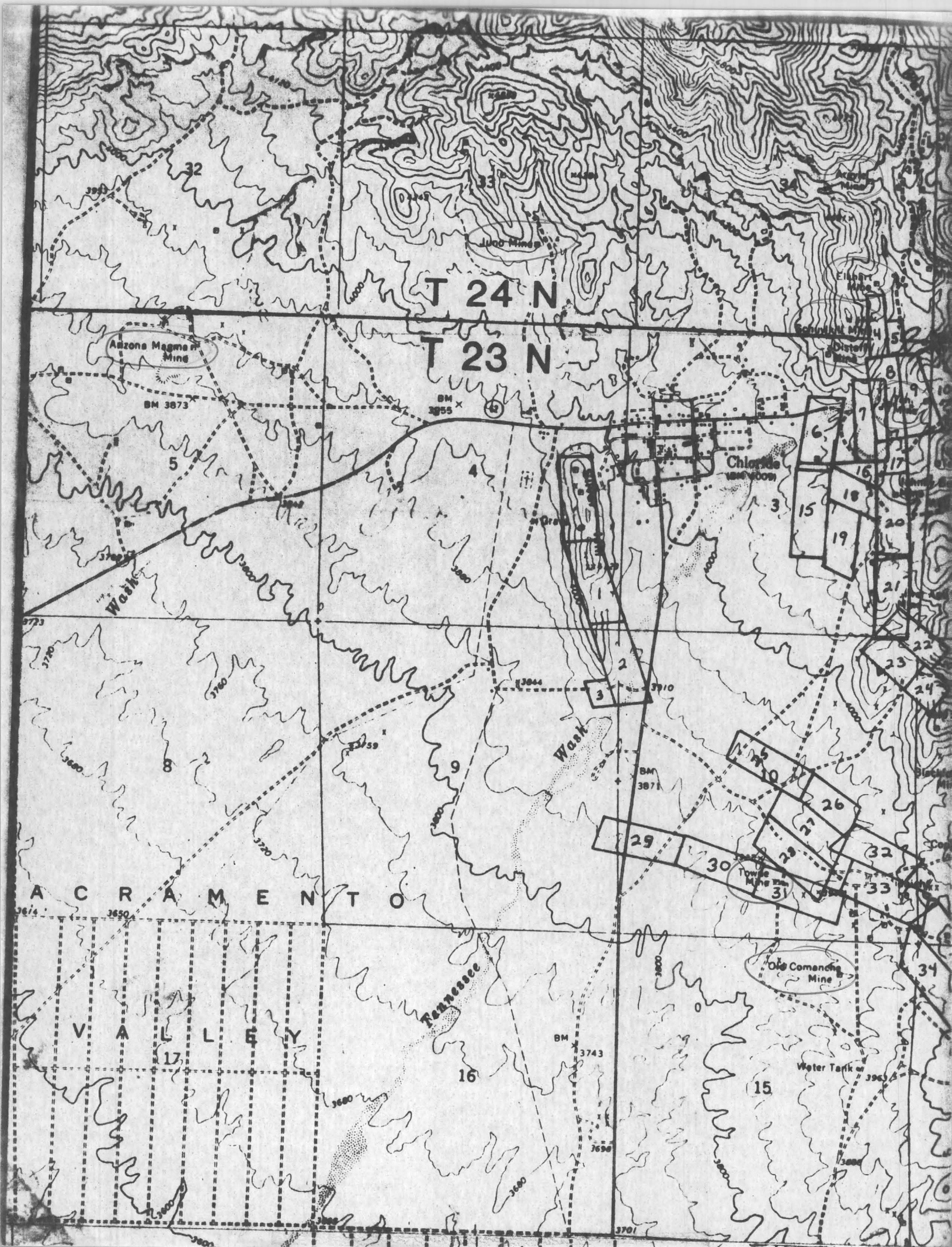
T 24 N
T 23 N
Arizona Magma Mine
BM 3873
BM 3955
Chloride
Wash
Tennessee
Wash
BM 3871
Towle Mine
Old Comanche Mine
Water Tank
BM 3743
A C R A M E N T O
V A L L E Y

GOLD, SILVER, COPPER, LEAD AND ZINC RECOVERED FROM ORES
at the
TENNESSEE - SCHUYLKILL MINE
Chloride, Arizona
from
1901 to 1943

Year	Tons Ore	Tons Concentrate	Ounces Gold	Ounces Silver	Pounds Copper	Pounds Lead	Pounds Zinc
1901	25,805		8.87	2,469		4,421,678	
1902	7,567		85.89	29,448		1,619,640	
1903	1,090		15.26	4,360		279,468	
1907	154		23.89	2,047	235	90,960	
1910	70	10	3.22	127		6,654	
1911	998	328	78.63	2,638	1,837	97,572	87,486
1912	1,358	988	266.67	13,127	2,361	459,771	260,966
1913	29,486	14,360	1,370.29	106,924	16,568	4,740,278	4,233,642
1914	22,081	12,671	739.15	74,748	11,981	3,657,302	4,932,108
1915	47,633	22,187	2,191.00	171,366	45,000	6,034,998	8,351,839
1916	47,013	19,777	1,564.00	135,158	32,285	5,086,177	7,517,627
1917	41,133	21,347	1,914.00	160,981	55,300	5,039,156	8,352,860
1926	164	71	12.71	819	435	32,024	32,697
1929	58	29	4.41	307	183	15,142	13,008
check monopo report 1936	12,233	3,239	2,870.00	40,850	24,300	1,433,000	1,000,000
1937	59,990	12,084	10,467.00	138,960	100,000	4,553,000	3,414,000
1938 56008	54,092	11,340	9,642.56 ?	107,720 ?	86,500 ?	3,792,450 ?	5,449,656
1939	11,762	3,197	1,088.60	24,198	22,280	676,560	1,624,000
1940	55,577	17,521	3,249.51	132,775	19,880	4,607,740	9,543,100
1941	45,150	10,590	2,843,28	113,061	11,340	4,854,860	4,330,580
1942	40,055	7,552	2,278.08	100,194	17,160	3,284,880	3,383,980
1943	38,286	6,115	1,079.63	71,698	58,521	2,677,185	3,492,209
1944 1945 1946 1947							
	541,755	163,406	41,796.65	1,433,975	506,166	57,460,495	66,019,758

1944 PRODUCTION

Period	Tons	Average Grade Au	Ag	Pb	Zn
Year 1943	38,286	.036	2.01	3.70	5.91
Jan., 1944	2,298	.037	2.76	4.81	8.14
Feb., "	1,982	.043	2.85	4.59	8.08
Mar., "	1,978	.039	1.89	3.79	5.96
Apr., "	2,683	.033	1.77	3.35	6.90
* May, "	3,019	.024	1.23	2.58	4.75
June., "	2,407	.032	1.92	3.49	6.66
July, "	2,480	.030	1.48	3.32	5.82
Aug., "	2,170	.029	1.32	3.32	5.26
	57,303				

* 1,377 tons dump ore included

					Cu	
			24.5	60.5	3.68	
Nov 1947 Pb	82	1.30				
	44	.305	32.3	58.0	1.90	
1946	about 3555	.05 Au	2.5 Ag	4.15 Pb 83	7.03 Zn 14.06	
		175.00	875.00	290500	492100	

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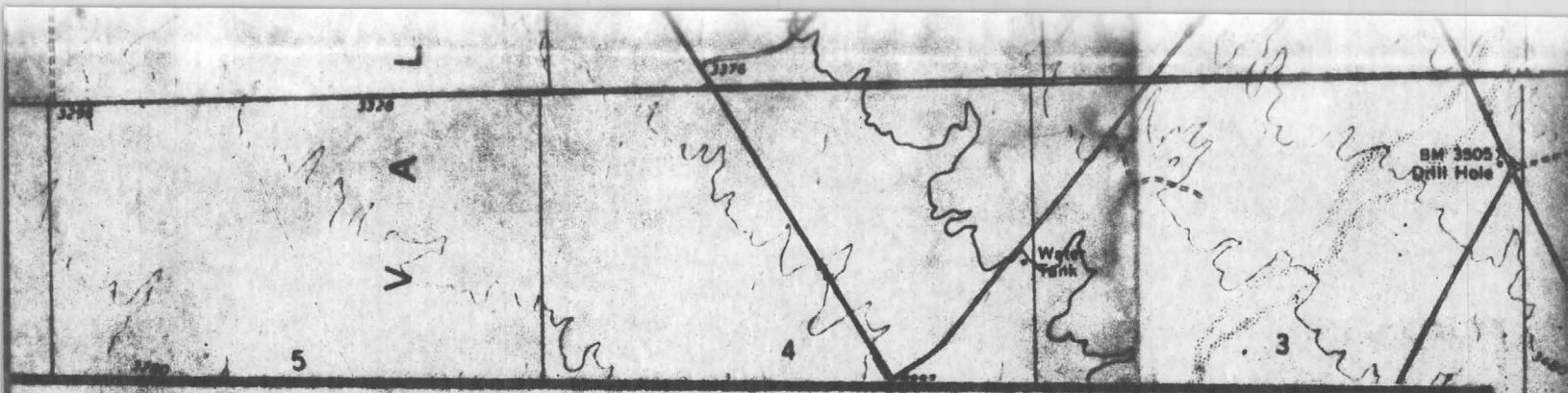
* 1,377 tons dump ore included

TABLE 2.—*Production of gold, silver, copper, lead, and zinc of selected mines in the*



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121. "78"
122. FLAGSTAFF
123. PRES. CLEVELAND
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126. RED DOG
127. CERBAT
128. JUROR #2
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130. FLORES NORTH #2
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155. TWINS EXTENSION
156. DAISY TWINS
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159. ORIGINAL NEW LONDON
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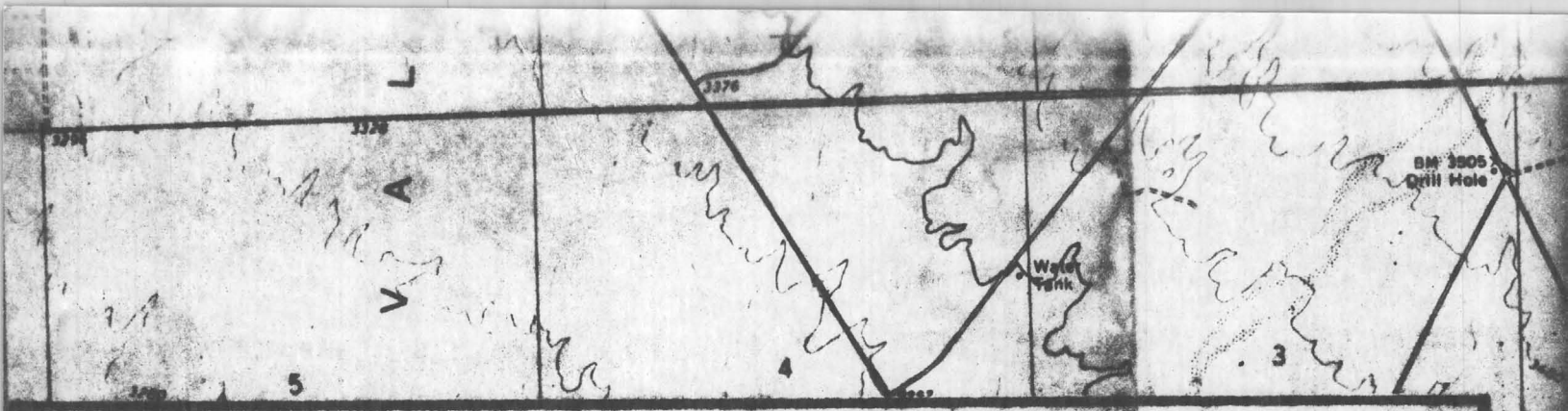

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147. SIWASH
148. BLACK WARRIOR
149. SACOTASH
150. BLACK EAGLE
151. BLACK EAGLE ANNEX
152. FRACTION
153. TWIN BASIN
154. TWINS
155. TWINS EXTENSION
156. DAISY TWINS
157. CHAMPION
158. BENTON
159. ORIGINAL NEW LONDON
160. STORM CLOUD

0. Valley View
1. SONOMA
2. SILVER BELL
3. SILVER BELL MILL SITE
4. SCHUYL KIL
5. SCHUYL KIL MILL SITE
6. WILIACE-BULLION BECK
7. GREAT LEAD
8. TENNESEE
9. PEGGY
10. BULLION SOUTH
11. BURLOCK
12. BLACK PRINCE
13. RAMBLER
14. PAY ROLL
15. MOLLY GIPSON
16. TERMINAL
17. JOHNNY BULL
18. MONTANA
19. ARIZONA
20. SILVER KNIGHT
21. SILVER AGE
22. LITTLE GIANT
23. ALTATA
24. CINCO DE MAYO
25. COPPER BAR #1
26. COPPER BAR
27. COPPER WONDER
28. COPPER GLANCE
29. WONDER
30. BRYAN
31. TOWNE
32. BUCKEY ONEIL
33. MIDNIGHT
34. READY CURE
35. PINKHAM
36. 20th CENTURY
37. RELIEF
38. BILLICAN
39. EMPRESS
40. BUFFER
41. GRAY EAGLE
42. HAMLIN
43. MILL SITE
44. EMERSON
45. CONDOR
46. ARASTA
47. "97"
48. HUBSON
49. AURORA
50. BERKLEY
51. RAINBOW
52. LOOK OUT
53. LINGREN
54. GRAND VEIN
55. MONTCLAIR
56. OLD TIMER
57. SILVER COIN
58. LUCKY BOY
59. LUCKY BALDWIN
60. QUEEN
61. BRIGHTER DAYS
62. SAMOAN
63. RURAL #2
64. METALLIC ACCIDENT
65. GOLDEN STAR
66. LONE STAR
67. SABBATH BELL-GOLDEN FRACTION
68. GOLDEN FRACTION MILL SITE
69. ARK
70. ANTONE
71. TRUE BLUE
72. COPPER APEX
73. GOLD
74. SILVER
75. LEAD
76. ANTIMONY
77. COPPER
78. ZINC
79. SKY SCRAPPER
80. SILVER MONSTER

0. Valley View
1. SONOMA
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3. SILVER BELL MILL SITE
4. SCHUYL KIL
5. SCHUYL KIL MILL SITE
6. WILLACE-BULLION BECK
7. GREAT LEAD
8. TENNESSEE
9. PEGGY
10. BULLION SOUTH
11. BURLOCK
12. BLACK PRINCE
13. RAMBLER
14. PAY ROLL
15. MOLLY GIPSON
16. TERMINAL
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24. CINCO DE MAYO
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31. TOWNE
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41. GRAY EAGLE
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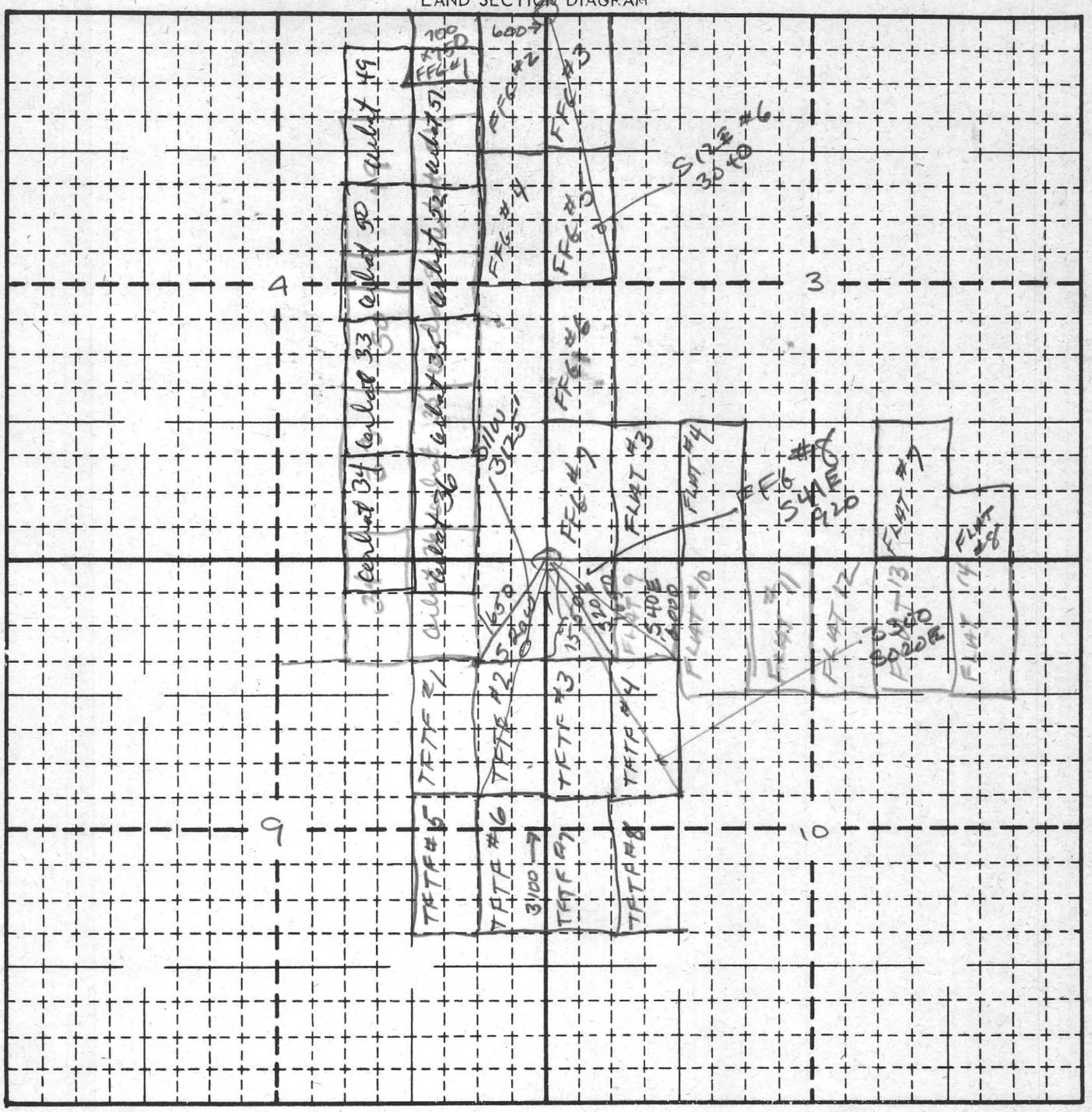
80. SILVER MONSTER

Form 9600–16
(May 1978)
(formerly 9180–14)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

LAND SECTION DIAGRAM



Land description

Section	Township	Range	Meridian
3, 4, 9, 10	23 N	18 W	

Remarks

TFTF #1-8 600 x 1500 AMC 94669-94676
Cyprus Resources Box 473 Boulder City Nev 89005
FFG #1-8 AMC 112527-112534 → P.O. Box 6 Boulder City Nev 89005

Terry A Gaucher
Sec/Treas

Prepared by:

Date

GPO 845-747

INSTR.	DKT. / PAGE	DATE / REC.	GRANTEE	FROM / TO	MASTER	MONTH	DAILY	REMARKS
			to North East Corner					
	FLAT	3	1200 E & 1500 N 4,3,9,10					
		4	1800 E & 1500 N ✓					
		7	3840 E 1500 N ✓					
		8	4440 E 1000 N ✓					
		9	1200 E of Sec ✓					
		10	1800 E of Sec ✓					
		11	2400 E ✓					
		12	3000 E ✓					
		13	3600 E ✓					
		14	4200 E ✓					
	FFG #1	#1	600' W of 4,3					
			720 long × 600 ↕					
		2	@ sec 4,3					
		3	600' E of Section 4,3					
		4	1500 S of ✓					
		5	1500 S & 600 E of ✓					
		6	2890 S & 600 E of ✓					
		7	800 N & 600 E of 4,3,9,10					
		8	900 S & 600 E of ✓					
	TFTF	1	1650 SW of Sec 4,3,9,10					
			1350 NW of BM # 3871					
		2	1550 SW of Sec 4 3 9 10					
			1050' NW BM 3871					
		3	1050 NW BM 3871					
			1650 SE of Sec Cor 4,3,9,10					
		4	1400 NE of BM 3871					
			2000 SE Sec Cor 4 3 9 10					
		5	1000 SW ~~BM~~ 3871					
			3125 SW Sec 4,3,9,10					

Form No. A-139
(Previous No. A-329)

INSTR.	DKT. / PAGE	DATE / REC.	GRANTEE	FROM / TO	MASTER	MONTH	DAILY	REMARKS
	TFTF	6	550 SW of BM 3871					
			3100 S of Sec 4,3,9,10					
		7	625 E of Bm 3871					
			3150 SE of Sec 4,3,9,10					
		8	1,100 SE Bm 3871					
			3300 SE Cor 43910					
	Cobat	35						
			1500 x 600					

Form No. A-139
(Previous No. A-329)

D.K. MARTIN & ASSOCIATES
Mining Development & Administration
4728 N. 21st Avenue
Phoenix, Arizona 85015

S I L V E R H I L L M I N E

WALLAPAI MINING DISTRICT

Mohave County, Arizona

(602) 246-9573

T 24 N
T 23 N
Chloride
(BM 4009)
Arizona Magma Mine
BM 3873
BM 3955
Wash
Wash
Dardanelles Mine
Argyle Mine
Schuykill Mine
Distelfi Mine
New Jersey Mine
Tennessee Mine
Johnny Bull Mine
Well
Clyde Mine
Pennsylvania
Mesota Conner
Blackfoot Mine
Lone Jack Mine
Uncle Abe Mine
Hidden Treasure Mine
Copper Age Mine
Jackpot Mine
Eureka Mine
Towle Mine
Pinkham Mine
Old Comanche Mine
Denver
C R A M E N T O

Geology

Work Sheets

Regional: From a regional standpoint, etc etc

Local:

The surface outcrops on Silver Hill is primarily of amphibolite schist and granitic rocks of Pre-Cambrian age. Coarse granitic rocks of Laramide age have intruded the western base of the property. The Laramide Complex (Cretaceous-Tertiary) is locally cut by dikes & stringers of Garnet bearing aplitic granite and a coarse pegmatitic granite

The schist has a Strike of N. 7-10° W & Dips 60° East & is cut by a well marked Shearing that dips about 35° W.

The northern half of the ridge is cut by a well marked mineralized Vein ranging from 2 to 12 feet or more in width. The Vein or mineralized zone lies within a Brecciated zone 20 to 40 feet wide which was created by fault action. Slickensided material is prevalent in the breccia which is indicative of major fault action. The crushed (breccia) zone is primarily silicified rhyolite porphyry. The ore is in lenses in the crushed zone

(over)

The main ore veins appear to be near the foot wall in the northern part of the property in the Valley view claim. In the central part of the property, primarily in the Sanoma claim, the vein material lies about half way between the foot and hanging walls. In the southern part of the Sanoma & northern part of the Silver Bell claim, the ore vein splits into two veins, one near the foot wall & the other near the hanging wall.

These veins range from a few inches to as much as 10 or 12 feet in width. The veins can be traced on the surface along most of Silver Hill for about 4000 feet but the most prominent outcrops extend at least 2000 feet.

C. W. Herron, mining engineer reports, "The Silver Hill vein occurs in a strong persistant fissure or fracture zone which follows the contact of the pre-Cambrian schist and the younger granite. The Silver Hill vein or fault has a strike of N 10 W and an average dip of 47° E." Subsequent field investigations

← show the strike to be 7 to 10° West and dips from 45° to 58° East. The younger granite intrusive is probably Laramide in age (Cretaceous-Tertiary) which is considered the source of mineralization in the Chloride and adjacent mineralized areas. No attempt will be made to go into the geological sequence of events at this time except to state that the mineralization is related to the Laramide intrusion in the pre-Cambrian complex.

More than 100 samples have been collected by reliable mining personal and the resultant assay values are acceptable within a reasonable degree of accuracy.

Many samples were taken underground before the shafts & tunnels caved. Many more samples were taken from surface outcrops. Assay averages are as follows for ore: (RFC)

	AU	Ag	Pb	Zn	~~Cu~~
All veins	0.28 oz/Ton	2.80 oz/Ton	3.0%	4.9%	
North Drift 66" vein	0.20	2.50	1.75%	5.0%	
Shipped Ore - Hand sorted or selective mining.					
	0.33 oz	4.4 oz	3.3%	6.1%	

(11)

Work Sheet

Production during 1941 Hayden Smelter (Ariz Min. Resources)

Smelter Returns	Au oz	Ag oz	Cu %	Pb %	Zn %
36.6 Tons	0.358	2.3	0.19	3.7	—

1942 El Paso Smelting Works

42.8 Tons	0.78	3.70	0.435	5.25	3.20
23.2 "	0.91	5.10	0.650	9.45	6.20
41.2 "	0.56	3.40	0.360	6.40	5.30

1943 (Smelter unknown)

114.6 Tons	0.53 oz	4.40 oz	0.55%	8.9%	6.2%

(Ariz Mineral Resources Report 1943)

Oxidized Zone (Between Shafts 1 & 3 19,700 Tons

Av. Au - 0.167, Ag 2.55

Sulphide ore, 5000 tons est. but may have not been fully blocked out (Prepared

Au 0.32 oz Ag 1.80 oz Pb 4.40% Zn 5.67%

The oxide - sulphide contact is about 70 feet below the surface. The oxide zone has the highest gold & silver content, however, when the mine was working during World War II the R.F.C. was primarily interested in Lead & Zinc and the precious metals were considered by-products.

Put top page I

From a regional standpoint, the Silver Hill property lies in an area approximately 10 miles long & 4 miles wide called the Wallapai District. This area is highly mineralized and many mines are present. Within the Wallapai District, the ore deposits hold with depth. The Tennessee mine, one mile east of Silver Hill and on a parallel vein, good sulphide ore was still present at 1600 feet. In many other mines in the district, good ore was still present at their max depth of 500 & 600 feet. This deeper ore is complex sulphide ore. The oxidized zone averages 150 feet in depth in the Wallapai, although the oxidized zone at Silver Hill is about 70 feet in depth.

Dept. Immanuel Newman Geog Report 1943

June 1944 Thru. July 1945

Shipped 1329 Tons –	Au	Ag	Pb	Zn	Cu
	0.1935	6.69	4.85%	4.94%	0.21%

No Known prod after 1945

Source 10-1-43 Ltr from mine supt to Western Knapp Eng Co. San Francisco

Data from Bkr of mine, RFC, min Hancock Eng & Mr. Farnham operating supt.

Mining below 100' level

Vein 7½ ft. Au 0.28oz Ag 2.8oz Pb 3.0% Zn 4.9%

RFC 7-20-42

TABLE 3. - Data on Bureau of Mines samples from Liberty mine

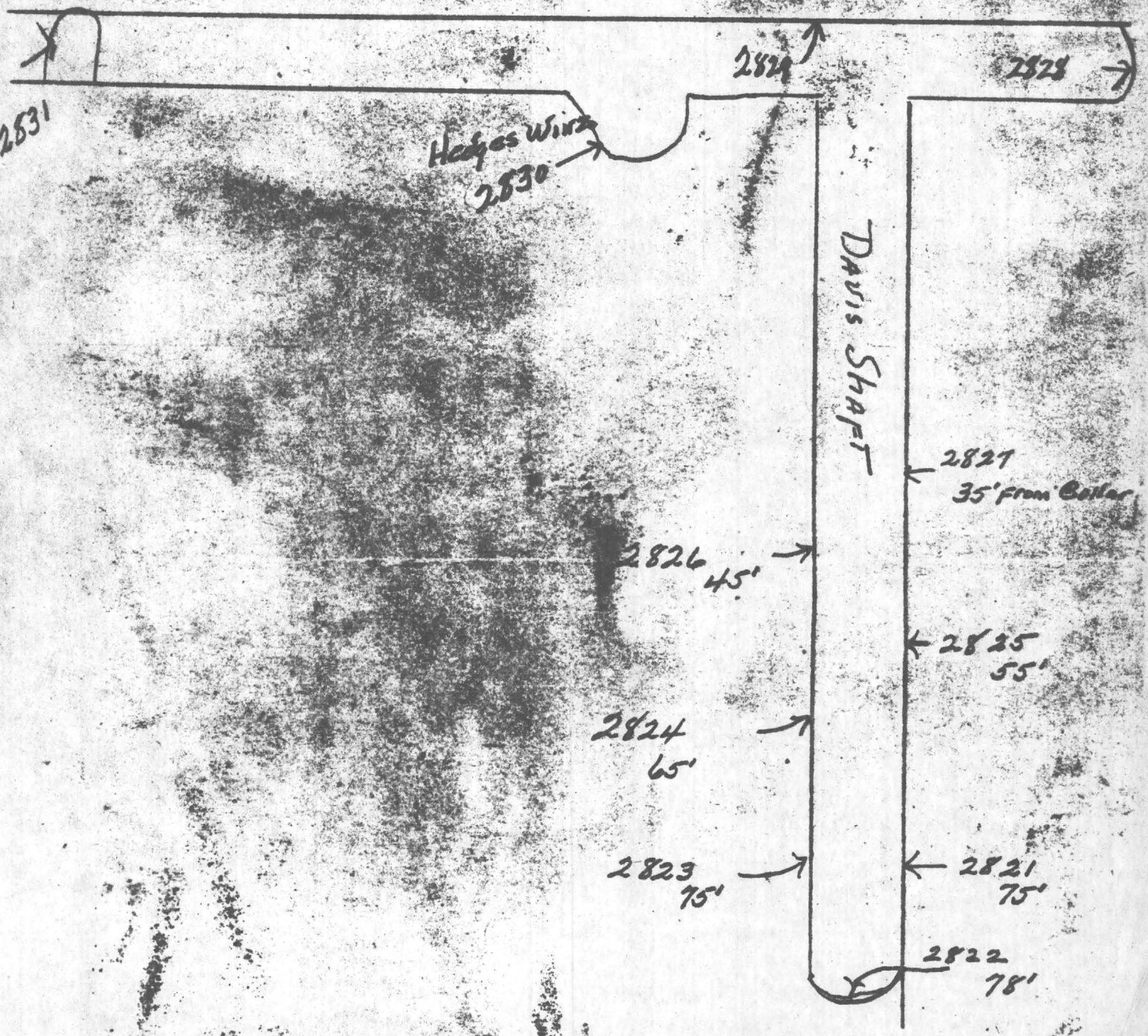
No.	Location	Description	Length, feet	Assays				
				Percent			Ounces/ton	
				Pb	Zn	Cu	Au	Ag
2821	Winze, 75 ft. from collar, N. side.	Soft, talcy, sulfides	6.0	2.3	3.6	0.03	0.185	1.20
2822	Winze, 78 feet from collar, center of winze.	do.	4.5	2.6	3.8	.03	.125	2.95
2823	Winze, 75 ft. from collar, S. side.	do.	5.5	.4	.1	.02	.045	[illegible]
2824	Winze, 65 ft. from collar, S. side.	do.	5.2	4.3	5.4	.09	.260	2.15
2825	Winze, 55 ft. from collar, N. side.	do.	5.3	6.9	6.5	.02	.255	2.85
2826	Winze, 45 ft. from collar, S. side.	do.	6.0	1.4	3.7	.03	.730	1.10
2827	Winze, 35 ft. from collar, N. side.	do.	5.2	2.6	6.7	.20	.935	2.35
2828	North end of main tunnel, breast.	Soft, oxidized.	4.0	.3	.1	.03	.005	.40
2829	Main tunnel, 3 ft. S. of winze, W. side.	Soft, oxidized, some sulfide.	2.3	.2	.1	.02	.005	.50
2830	Small winze, S. side, 10 ft. below drift.	Heavy sulfide	5.2	7.1	3.2	.47	.360	3.95
2831	Main tunnel, 39 ft. S. of small winze.	Soft, partly oxidized some sulfide	2.8	.2	2.6	.02	.090	.60
2832	S. drift, SW crosscut, S. side.	Soft, talcy, oxidized some pyrite	4.2	.1	1.9	.04	.010	.40
2833	S. drift, crosscut SW 15 ft. NE of end of crosscut.	Soft, talcy, oxidized	6.0	.2	.8	.02	.010	.25
2834	S. drift 45 ft. S. of main crosscut.	do.	4.2	.5	1.1	.04	.070	.30
2835	S. drift, 20 ft. S. of main crosscut.	Soft, talcy, oxidized, some sulfide	4.0	3.1	.8	.04	.125	[illegible]

by Bur[illegible] of Mines
July 1943.

2.3

No.	[illegible]	[illegible]	[illegible]	[illegible]	Au	Ag
2821	6.0 ft	[illegible]	[illegible]	.03	.185	1.2
2822	4.5	2.6	3.8	.03	.125	2.95
2823	5.5	0.4	0.1	--	.045	0.05
2824	5.2	4.3	5.4	.09	.26	2.15
2825	5.3	6.9	6.5	.02	.255	2.85
2826	6.0	1.4	3.7	.03	.73	1.10
2827	5.2	2.6	6.7	.20	.935	2.35
2828	4.0	0.3	0.1	.03	.005	0.40
2829	2.3	0.2	0.1	.02	.005	0.50
2830	5.2	7.1	3.2	.47	.36	3.95
2831	2.8	0.2	2.6	.02	.09	0.60

Pb Zn [illegible] Au Ag



ment of chalcocite on the pyrite and chalcopyrite. The vein at this point stands about vertical or dips very steeply northeast instead of southwest, its normal direction.

Later a fine body of high-grade copper sulphide ore, 18 to 24 inches in width, was opened in extending the drift northwestward on the fourth or 140-foot level. This ore averaged about 9 per cent of copper and 60 ounces of silver to the ton.

On the fifth or 230-foot level, which is practically the bottom of the mine, the vein dips about 70° SW. and is from 4 to 6 feet in width. The face of the drift, 100 feet northwest of the shaft, shows a width of 8 feet with the foot wall not yet in sight. Here the vein consists of coarsely streaked or irregularly banded ore, crushed quartz, and altered country rock, all pretty soft and containing 4 to 6 inch gouge seams.

South of the shaft the vein is mineralized for a width of 20 feet or more, and at the end of a 40-foot crosscut into the hanging wall there is a good looking small vein 1½ feet wide, which dips steeply to the northeast.

MIDNIGHT MINE.

The claim of the Midnight mine practically joins that of the Pinkham mine on the northwest, as shown in Plate III, and, like the Pinkham, is situated on open, gently sloping ground. (See Pl. VI, *B*.) The mine was discovered prior to 1866. The original owner was a pioneer named Carpenter, who in early times hauled some of the ore to the Mineral Park mill. Later the mine was owned by Heimrods, McDuffee & Gilleland, and still later by the partners Darius Brown, Robert Gibson, James Boyd, and John St. Charles. Finally, about 1898, John St. Charles and his brother Keene became the sole owners. They alone have done most of the development, and have shipped ore from the deeper levels.

The mine is developed principally by inclined shafts, drifts, and crosscuts, and is equipped with a gasoline hoist. The main shaft is 200 feet deep, and the drifts, crosscuts, and stopes aggregate several hundred feet of workings.

The same country rocks prevail as in the Pinkham vein, being principally pressed and crushed microcline-biotite granite, and this is also intruded by the same classes of diabase and granitic dikes in or near the mine, the diabase apparently being the later of the intrusives (fig. 11). The vein or lode is less well defined than the vein in the Pinkham mine. As shown in figure 10, it strikes in general about N. 65° W. and on the southeast seems to join the Pinkham vein. It has a width of 50 to 75 feet and contains much low-grade ore. As seen in the mine, it contains two main veins or ore bodies, of which the principal or south one strikes about northwest and dips irregularly southwest at angles of 35° or more. The second vein strikes about N. 80° W. and dips steeply to the north.

A large amount of good ore is shown in the mine, but it contains much zinc, and considerable disturbance, including lateral faulting, has taken place, by reason of which further development is needed before the structure can be worked out. The ore contains silver, copper, gold, zinc, and iron. The silver occurs mostly in chalcopyrite, the rule being the more chalcopyrite the more silver. Some bornite is present. The gold is found principally in the pyrite. The zinc blende, though more or less mixed with the ore, occurs also in a relatively pure 3-inch shoot on the hanging wall in the northeastern part of the mine.

For some years past the mine has been shipping copper ore in a small way. This ore was rich and averaged about $1,500 a ton, but some of it contained 5 or 6 per cent more of zinc than the 10 per cent allowed by the smelters and was accordingly penalized. It seems probable that by the use of a suitable magnetic separator the zinc could be extracted and profitably marketed as zinc ore. In certain parts of the mine the ore contains 30 to 40 per cent of zinc, and is so low in other values that it will be shipped as zinc ore. A recent carload shipment of the ore averaged 66 ounces in silver and $2.50 in gold to the ton and 4.5 per cent of copper. Under the present management the mine has produced about 300 tons of ore, with a total value of about $7,000. The ore is reported to mill about 5 to 1.

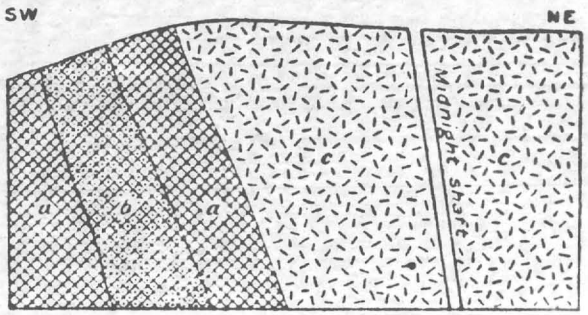


FIGURE 11.—Diagram showing intrusions near Midnight shaft. *a*, Aplite; *b*, diabase, intrusive into aplite; *c*, granite.

SILVER HILL VEIN.

The Silver Hill vein is located on Silver Hill, a prominent elongated ridge just southwest of Chloride and rising about 150 feet above it. It extends southward nearly to the railroad station. The ridge trends about north and south, is about three-fourths of a mile long and one-eighth of a mile broad, and is composed almost wholly of dark amphibolite schist. A coarse granititic rock appears to be intruded in its western base, and it is locally traversed by dikes and stringers of the garnet-bearing aplitic granite and also by a coarse pegmatitic granite. The schist dips about 60° E. and is cut by a well-marked sheeting that dips about 35° W.

As shown by openings and croppings, the northern or main half of the ridge is traversed longitudinally just west of the crest by a well-marked vein or mineral zone, varying from 2 to 12 feet or more in width, whose croppings, hardly rising above the surface, consist of brownish, yellowish, or greenish stained quartz, and seemingly altered dike material, which in places is calcareous and brecciated. The foot wall consists of a bowldery or brecciated schist.

The vein strikes N. 7° W. and dips steeply east. It is opened at intervals along its extent by five or six inclined shafts, some of which attain a maximum depth of about 100 feet. The work was done mostly in pioneer times, as this was among the first veins worked in the district. The ore contains silver, lead, and gold and is reported to carry about 2 ounces of gold to the ton, but the principal production is stated to be a small amount of lead.

JUNO MINE.

The Juno mine is situated in the low foothills about three-fourths of a mile northwest of Chloride, and is supposed to be located on the northward continuation of the Silver Hill vein. It is one of the early locations and was worked intermittently until about five years ago, when the shaft caved in, since which time work has been suspended. It was developed to the depth of 600 feet and equipped with a steam hoist. It is owned by E. T. Lloyd and B. Miller.

The vein dips steeply to the northeast. It is said to have been large on the surface, and the ore on the whole is rich. The surface ore was treated by a leaching process. The mine is stated to have produced much good ore and is regarded as a good property. Several operators have derived good returns from it.

MERRIMAC MINE.

The Merrimac mine is situated about a mile west of Chloride, at the border of the foothills and the Sacramento Valley, on open ground. It is one of the early discoveries and is owned by the Minnesota-Connor Mining Company. It is developed to the depth of about 200 feet and is equipped with a hoist and concentrating mill, but has not been worked for some time. The concentrating tables have been removed from the mill, and the mine has the appearance of being abandoned.

The country rock is pre-Cambrian coarse porphyritic gneiss. It is traversed by numerous veins or stringers, which are opened by prospect pits and shallow workings. The vein on which the mine is located seems to trend about N. 60° W. and dips to the northeast. The gangue is hard quartz and the ore contains silver and gold associated with pyrite. Much of the ore is banded and hard. The high-grade ore contains ruby silver with a small amount of gold. Difficulty is said to have been encountered in concentrating the low-grade ore. A large dump shows that much work has been done, and the mine is reported to have produced considerable good ore.

TUCKAHOE MINE.

The Tuckahoe mine, one of the early discoveries, is 1½ miles west of Chloride, on the main road to White Hills. It is located on open ground, like the Merrimac mine, at an elevation of about 3,900 feet and in about the same class of porphyritic pre-Cambrian granite, which a few hundred yards east of the mine is cut by a diabase dike. Some basalt débris is strewn upon the surface. The mine is developed by a 45° inclined shaft, 200 feet deep, sunk upon the vein, and is equipped with a windmill hoist. It is owned by John Barry.

The vein strikes about N. 25° W. and dips about 45° NE. Certain irregularities suggest that other associated veins or stringers may be present near by, as at the Merrimac mine. The gangue is hard quartz and a mixture of quartz and country rock, locally crushed and recemented in the form of a breccia or conglomeratic mass, with many of the rock fragments rounded or pebble-shaped. The ore contains principally silver values, but some gold and galena are also present, all in association with iron pyrite.

The mine has produced a considerable amount of good ore. It was worked some years ago by the hyposulphite leaching process and $10,000 is said to have been extracted in one year. The latest ore shipped is stated to have averaged $10 in gold and 75 ounces of silver to the ton, and 17 per cent of lead. The mine is now producing in a small way.

TINTIC MINE.

The Tintic mine is situated on open ground in Sacramento Valley, about 1½ miles west of Chloride and half a mile south of the Tuckahoe mine. It is said to be located on a nearly flat-lying vein, which dips to the northeast and is from 2 to 10 feet thick. Water is said to be encountered at a depth of 40 feet below the surface.

The ore values are almost exclusively in gold and are said to average about $150 a ton in carload lots. The production is reported to be many thousand dollars, most of which has been obtained within a distance of about 200 feet, extending horizontally along the vein.

OTHER MINES.

Besides the mines already described there are in the district probably a score or more of small mines and promising veins, such as the Century group, Bobby Burns, Roger Boy, Goldback, and others, concerning whose locations and character data adequate for descrip-

B.1.d. (cont.) comprise a 335 foot crosscut to the foot wall of the crushed zone, 200 feet of drift development in the zone, and a 40 foot raise connecting with the bottom of the Old No. 3 shaft.

Mr. Segar's production includes about 300 tons derived in part from development on the level, but chiefly from stopping near the foot of the Old No. 3 shaft, and four carloads shipped during the past year by Mr. Hedges from several small stopes above and below the level. The 300 tons were run through a leased mill and averaged .296 ounces of gold and 2.24 ounces of silver. Head assays for lead and Zinc were not run. The concentrates ran: Lead - 12.60% and Zinc - 5.3%, and the ratio of concentration was 4.87 to 1. Recoveries of lead and zinc are not known, but since the material was mixed oxidized and sulphide ore, they were probably low, and lead and zinc in the heads are estimated to have run around 5% lead and 2% zinc. Settlement sheets for Mr. Hedges shipments are attached to the report. The material was mined intermittently by Mr. Hedges and his wife, and was sorted up to grade.

The following is a description of the Segar workings and the sampling:

~~Sample #9~~ in the ~~north face~~ of the level was ~~cut across 26"~~. The ~~material was all oxidized~~ and the sample included ~~several inches of reddish-yellow material against the hanging wall which panned considerable coarse free gold~~. This latter material shows several feet of length, and is not visible in the back of the drift at this point. Sample #8 was cut on the east wall of the drift 10 feet back from the face. The working place here is not timbered, and the floor is covered with caved material. It was not possible to get a sample out of the back because of the unsafe condition of the ground.

At 20 feet south from the face, a fault cuts diagonally across the drift. The material north ~~of the fault is~~ all ~~oxidized~~, while south ~~of the fault~~, oxidation ~~is only partial~~. Sample #4 south of the fault showed considerable sphalerite with galena and cerrusite.

Samples #5, #6, #7 and #10 were cut in a stope which Mr. Hedges had opened at this point. He reported that he removed 38 tons from here which

Data Notes

Data from Reconstruction Finance Corporation

R.F.C. Reports - Wash D.C. - Field Eng Report

Ariz Dept. of Mines Resources, Phx - " " "

D.K. Martin files

Aerm Report - 1941

Heron Report - 1941

Cave & Snaccenube

@ 1934 Report by R.D. Leisk 1934

Au - .37 oz Ag - 2.1 oz Pb - 1.56% no Zn Reported.

Jacobson hunt Au assay a .17 in same area.

Mineralized Zones in the 30' crushed zone

(a) on the foot wall (North end) (b) Half way between foot & hanging wall (center)

(c) on both foot & hanging wall. (S. end

Vein outcrops most of 4500' Length of Claims

From 1880 to 1936 Silver Hill produced 700,000 # Pb,

$5,000 in gold ($21/oz) (350?) & $10,000 in silver (714 oz)

Smelting - get 89.5% of Au & 93% Ag. Pb 95.8% Zn 89.5%

Ore occurs in shoots & lenses in a fault zone up to 30' wide

Country Rock is altered pre-C granite & Amphibole Schist (No Qtz)

Vein dips 45° E str N 10 W. Mw dip 58° E

Sneyphite at 70'

Schoenfeld - Chicago Hurm - Matlock CPA

6' wide 4000' Long 620000 Tons

70' deep

~~30~~ 70 x 4000 = 311,111 Tons (300,000

.2 x 300,000 Tons = 60,000 sq ft x $300 = 18 million

7.5 x 70' x 2000' = 1,050,000 sq ft ÷ 27 = 38,889 Tons

6.5 x 70' x 2000' = 910,000 " ÷ 27 = 33,704 Tons

72,593 Tons x .2 sq = 14,519 sq ft

14,519 sq @ $325 sq = $4,718,345

Over 100 reliable samples have been assayed
Av. .2 – .33 g/Au

In a regional sense, almost all mines in the area have good ore at depth

Oxidized zone about 70'

Jones Mine about ½ N of Silver Hill is in the Silver Hill Trend

The Tennessee Mine is on a parallel vein 1 mile to the East

Regionally, the whole area is highly mineralized as the Pine Creek Complex

has been intruded by Laramide (Cret.-Tert.) granitic complex

Too much Zn so leaching is not good.

RFC value

Ore Shipments – hand sorted – had Values of:

Oz Au	Oz Ag	% Pb	% Cu	% Zn
.565 – .915	3.4 – 5.15	5.25 – 9.45	.36 – .65	3.2 – 6.2

Ore Samples

Width of Vein	Oz/Au	Oz/Ag	% Pb	% Zn	RFC Values
Gold get level & Shaft					
2.1' – 5.35' Av. 3.85'	.22 – .50 Av. .382	1.28 – 5.76 Av. 3.31	3.17 – 12.40 Av. 6.07	4.25 – 7.55 Av. 5.39	

pg 10 RFC Feb 30/1902

Smelter Returns – 241 Assays

Au – .26 oz – .36
Ag – 3.55 – 5.2 oz
Cu – 0.48 – 0.49%
Pb – 5.0 – 6.8%
Zn – 5.13 – 5.88%

Ore –

Some Samples were Oxide
Dump " mostly oxides

Note almost all mine in the Vicinity have good ore w/ depth – Tennessee – 1 mile E is good TO 1600' or more.

Ore Vein in Crushed zone Av. 7.5' 5.6' – 10' wide

Country Rock – Pre-C granite, Schist & gneiss intruded by Pegmatites, Rhyolite & Saramak granites

Silver Hill Vein is a Crushed (Fault) zone 20–40' wide along a Contact between Granite & Amphibolite schist

Crushed Zone is Silicified Rhyolite Porphyry. Str N10W Dip 47° E
Ore in thin lenses in crushed zone.

98.6 AU
1960 AC
178 PD
372 22
$123.00
0 CV

98
1960
$117.60

Reconstruction Finance Corporation
MINING DIVISION
Report of Superising Engineer
SILVER HILLS MINE

Docket No. B-ND-4276
Date Authorization for Exam. Rec'd. July 30, 1942
Date of Examination, incl. Aug 15 - 16
Date of report

1. Name and Address of Applicant.

Name. Wm. S. Segar
Address P.O. Box 243
City & State Chloride, Arizona

2. Correspondent Wm. S. Segar
c/o Sidney Rosenbaum
76 Williams St.,
New York City, NY.

2. Character of Project

Development of zinc-lead-gold-silver property

3. (see insert Page 1A)

4. Applicant

The applicant was not present during the examination. Mr. Hedges, the custodian on the property, is fully conversant with the situation and acted as guide and helper. The applicant, Mr. Segar, is not a mining engineer but appears to be one who has considerable experience with the business details of mining. He formerly ~~was in Wyoming where he~~ was connected with ~~[illegible]~~ mining development in Wyoming. He expresses the intention in his application to place the mining operations in the hands of a competent

3. Location of Mine

The mine is located in sections 4, 9 and 10 Township 23 North, Range 18 West, G. & S.R.B.L. in Mohave Co., Arizona. The mine is on the western edge of the Town of Chloride, and is 22 miles north by highway from Kingman, Arizona, the nearest rail point and supply center.

mining engineer and to handle the business details himself. Mr Hedges has taken care of the development to date for Mr. Segar and is now mining and shipping from the property. Mr. Hedges retains the proceeds from these shipments ~~as~~ in return for maintaining the workings and as payment on account owing for past services. Mr Hedges while not a mining engineer is a competent practical miner with an intelligent understanding of mining problems. He has had charge of mining work and has been a successful lessee in various mining camps.

correct said name

lessee

5. Loan Requested
$20,000

6. A General Features

1. ~~The portal of the main crosscut together with the compressor bldg, blacksmith shop and one line, also cottage and well with windmill are located on the East Chance claim which parallels the claim. This claim is not listed~~

1. There are no mine workings etc which are not confined within the Applicant's ownership
2. Proposed project would comply with State compensation and safety first statutes.
3. There are no apparent legal discrepancies in the project.
4. There are no ~~unimpeded~~ impeded right-of-way facilities.
5. There is no likelihood of surface or subsurface trespass.

B. Existing Development

1. Mine is opened by shaft and tunnel.

a. Complete maps are included in the data supporting the application. Compass and tape survey (attached hereunto) was made of the present active workings.

b. Samples were cut with pick and mail and gathered on canvas. The mine openings are timbered and closely lagged and the vein material therefore is frequently not visible.

c. The major part of the workings are inaccessible. Those parts of the mine workings confined within the applicant's recent development were accessible and generally in good condition.

d. The property comprises 4 patented lode claims and 1 millsite, also 1 unpatented lode claim. All are held by the applicant under lease and option to purchase. History, description of claims, property ownership and lease agreements, and detailed regional geology are adequately covered in the several reports which are submitted as supporting data with the application.

The Silver Hills mine is located on a low hill on the western edge of the town of Chloride. The Silver Hills vein occurs as a broad crushed fracture zone (20-40 feet wide) along the contact between granite and amphibolite schist. The filling of the

crushed zone is a generally silicified rhyolite porphyry. The material has been subjected to intense repeated movement which has resulted in a ground crushed mass with numerous faults and gouge seams. Pronounced slickensiding is common and in places the silicified material has been reduced to a fine sand or powder. The general direction of the movements is parallel to the strike and dip of the contact though there are many cross faults which ~~These latter~~ however, do not penetrate the limiting walls of the crushed zone. Ore occurs in thin lenses scattered in a random manner throughout the zone and while there is ~~show~~ a general tendency to conform with the dip and strike of the contact frequently lenses are found lying at varying dips and strikes across the zone. The lenses generally lack continuity though such continuity as has been noted occurs at or near one or other of the limiting walls of the crushed zone.

contact not contact

The ore minerals are gold, silver, lead and zinc with minor amounts of copper. The material at the surface and in the upper part of the mine is oxidized. The history of development in the district indicates that sulphides begin to appear at shallow depth and that at depths of several hundred feet the mineralization is practically all sulphide. The water level in the old Silver Hills workings is reported to occur at approximately 150 feet from the surface on the slope of the fracture zone. The Segar workings appear to have been developed near the lower limit of the transition zone between oxidized and sulphide mineralization. Sphalerite is quite common in the upper part of these workings

and galena and pyrite begin to appear at about the level of the ~~x~~ cross cut and main drift.

Para The early development is described in the reports submitted with the application. These old workings are all caved and inaccessible.

MoTP The Segar workings comprise a 335 foot crosscut to the ~~foot~~ Foot wall of the crushed zone, ~~with~~ 200 ft of drift development in the zone and a 40 feet raise connecting with the bottom of the old No 3 shaft.

Par 11 Mr Segar's production includes about 300 tons derived in part from development on the level but chiefly from stoping near the foot of the old No 3 shaft and ~~four~~ Four carloads shipped during the past year by Mr. Hedges from ~~main~~ ~~drift~~ level. ~~level.~~ The 300 tons was run thru a leased mill and ~~averaged~~ averaged .296 oz Au and 2.24 oz Ag. Head assays for lead and zinc were not run. The ~~extent~~ concentrates ran Pb 12.60% and Zn 5.30% and the ratio of concentration was 4.87 to 1. ~~Recovery~~ Recoveries of lead and zinc are not known but since the material was mixed oxidized and sulphide ore they were probably low and Pb and Zn New B3 #3 in the heads ~~are estimated to~~ are estimated to have run around 5% Pb and 2% Zn. ~~respectively.~~ End 507 Settlement sheets for Mr. Hedges shipments are attached to this report. The material was mined intermittently by Mr Hedges and his wife, and ~~the mill~~ was sorted up to grade.

Par 12 Following is a description of the Segar workings and the sampling.

Par 13 Sample #9 in the north face of the level was cut across 26". The material was all oxidized and the sample included several inches of reddish yellow material against the hanging wall which pannED considerable coarse free gold. This material ~~appears~~ shows ~~for~~ several feet of length and ~~is~~ is not visible in the face of the drift at this point.

Sample No 8 was cut on the east wall of the drift 10 feet back from the face. This working place here is not timbered and the floor is covered with caved material. It was not possible to get a sample out of the back because of the unsafe condition of the ground.

Para At 20 feet south from the face a fault cuts diagonally across the drift. The material north of the fault is all oxidized while south of the fault oxidation is only partial. Sample No 4 south of the fault showed considerable sphalerite with galena and cerussite.

Para Samples No. 5, 6, 7 and 10 were cut in a stope which Mr. Hedges had opened at this point. He reported that he removed 38 tons from here which were included in a car ~~which was sent~~ sent to El Paso ~~and~~ which assayed:

Oz Au	Oz Ag	% Pb	% Cu	% Zn
.78	3.7	5.25	.435	3.2

Para The total payments for metals was $32.89 per ton (including bonus for lead) of which gold and silver accounted for $27.08. Shipper's net was $ 25.39 (including bonus for lead). The ore here rolled over the drift and made a good punch ~~pocket~~ in the hanging wall and just below the drift. Some sorting was done to make the grade for this car.

Para 20 feet South of the above described working Mr. Hedges opened another small stope below the level. Samples No. 1, 1A, 2 and 3 show narrow widths of sphalerite, galena and heavy iron sulphide with some carbonates of lead and zinc. Mr. Hedges stated that 16 tons from here were contained in a car that assayed:

Oz Au	Oz Ag	% Pb	% Cu	% Zn
.915	5.15	9.45	.65	6.2

Some sorting was done in making up this car.

Sample No. 19 (corrected to a width of 32") across the drip of the vein showed sphalerite and a little galena and cerussite. Timber and muck (Muck) on the side of the drift presented (Prevented) taking a sample north of No 19 on the drift but No 11 was cut in a cased area (cased) above the drift. The ground here is jagged and very loose and has caved (caved) out over a wide area.

Para South, and above sample No 19, a slope has been opened for approximately 25 feet on the slope above the top of the drift and a length on strike of 20 ft. Samples No 12, 13, 14 15 16 and 18 (on the end) show 20" to 36" of oxidized ore with some sphalerite. A muck sample (No 17) represented 10 or 12 tons of broken ore in the chute and on the floor of the slope. Mr. Hedges stated that 14 tons of ore from here was included in a 41 ton car which assayed:

Oz Au	Oz Ag	% Pb	% Cu	% Zn
.565	3.4	6.4	.36	5.3

Para The material from this working place was rather closely sorted for shipment.

Para South from No 18 the material in the drift was either not worth sampling or could not be examined because of timbering and muck.

Para Sample No 20 was taken from a small hole gouged (gouged) in the floor and showed sphalerite and small amounts of galena — with iron sulphide.

Para Sampling and inspection of this south part of the area does not indicate the presence of a worthwhile body of ore.

Para Sample 26 was cut on a pillar and showed oxide ore ~~apparently~~ in a lens which apparently strikes across the crushed zone but because of the close timbering in the area the extent of the

showing could not be determined.

Para Samples No 25 and 27 were taken across a lense lying near the foot wall of the crushed zone. The vein above samples No 26 and 27 was partially stoped and produced most of the 300 tons referred to above. Mr. Hedges is mining in this area at the present time and sample No. 28 represents the material which he is handling. He screens and sorts the material closely.

Para Sample No 29 was cut in the wall of old No 3 shaft. The material here is all oxidized.

Para The report by Mr. Jacobson, which is included among the applicants supporting data, lists the various dumps together with assays and tonnage estimates.

~~Since this report was made a separate attempt has been made to gather more material and recover some of the hundred tons of dump material and attempted to concentrate it.~~

~~Samples No 30 and 31 were taken as rough checks of the dump assays and also determine the lead and zinc contents which was not previously assayed for. The material in the dumps from sent sphalerite is mostly oxidized tho some sphalerite was noted. Sample No 30 was taken from the dump at No 1 shaft.~~

~~Sample No 31 was taken from the material in the dumps is mostly oxidized though some sphalerite was noted. Sample No 30 was taken from the No 1 shaft dump and No 31 was taken from the second dump at the old smelter site~~

~~Samples No. 30 and 31 were taken for a rough check of the dump assays and to determine the lead and zinc content.~~

~~Assays of samples No 30 and 31 check within reasonable limits with the gold and silver values obtained by Mr. Jacobson~~

~~Samples~~

~~The material in the dumps is mostly oxidized the some sphalerite is visible particularly in the large concrete dump at the old smelter site.~~

No. II Dump samples No 30 (at No 1 shaft) and No 31 (at the ~~smelter site~~ smelter site) were taken as a check on these figures, and also to determine the lead and zinc content, which was not previously reported.

The assays check within reasonable limits with the gold and silver values obtained by Mr. Jacobson. The material on the dumps is mostly oxidized though some sphalerite is visible particularly in the dump represented by sample No 31. Since the time of Mr. Jacobson's ~~examination~~ a nearby operator removed several hundred tons from the various dumps and attempted (unsuccessfully) to cyanide cyanidet.

C Proposed Development (see attached sketch)

1 Applicant proposes to sink a winze 100 feet below the present drift level in the north end of the mine and open a new level with 600 feet of drifting from that point. ~~Connections would be made with the north end of the 100 Ft. level opened from shafts No 1 and No 2 the north face of the north drift in the new workings is approximately 40 ft above the old 100 ft. level and~~

2. Applicant is not mining at present. Former stope operations were cut and fill and continuation of this method of mining is recommended.

D. Equipment

1. Equipment on the property consists of:

210 cu Ft. Chicago Pneumatic Compressor
40 H.P. motor
4-Room Cottage
Blacksmith shop
Compressor House
1-16 cu ft mine car
2 small water tanks
windmill
4' x 8' Air Receiver
550 Ft. 10# rails
300' - 4" pipe
400' - 2" ✓
460' - 1½" ✓
600' - 3/4" ✓
100 gal pressure tank.

2. There is no mill on the property. A test run in a leased mill on a nearby property showed an extraction of 88% of the gold and 84% of the silver. The run was made on material which

was largely oxidized and no attempt was made to determine recoveries on lead and zinc. The ~~T~~ mean by Tennessee-Schuylkill mill, a differential flotation plant makes a lead concentrate and a zinc concentrate with ~~the metals is considered~~ satisfactory recoveries for each of the metals.

3 Not applicable

4. Equipment and supplies required would include

Hoist and cable
2 Rock drills
Rail
Timber
Pipe~~s~~
Tools and general supplies.

5. Not applicable

6. Buildings on property are in good condition.

7. ~~The~~ mine is in the town of Elbride and living accomodations would not need ~~to~~ be provided at the mine

8. No further recommendations.

E. Cost Estimates

1. Successful operation of the property would require milling of the ore on the property or at a nearby location.

a Mining cost would be high because of (1) the narrow width of ore, (2) the soft crushed nature of the ground, (3) a high development cost because of the lack of continuity and ~~the~~ irregular occurrence of the ore lenses in the crushed zone. In view of the

(4)

Mo PP

Consideration might be given to shipping the product to a custom mill. There are no local custom plants however, and transportation costs to plants in Utah and New Mexico would be prohibitive except for the better grade portions of the ore body. Freight rate to the Midvale plant of the U.S. Smelt. & Ref. Co. is $4.51 on $20.00 ore and trucking to Kingman would cost $1.50 or a total of $6.01 for transportation. Milling charge would be $3.00 per ton.

above, and in the absence of a satisfactory performance record in the mine, an ~~adequate~~ estimate of mining and development costs is difficult. Allowance must be made for rapidly rising unit costs for labor and supplies. This engineer would venture an estimate of mining costs as follows (based upon a minimum output of 50 tons per ton)[21]

Mining	4.00
Development	2.00
Total	$ 6.00 per ton

b, c, d. Cost for Drifting crosscutting and raising ~~cost~~ is estimated at approximately $15.00 per foot.

e. Cost for sinking a single compartment winze ~~cost~~ is estimated at $30 per foot

f. Cost for Sinking of two-compartment shaft is estimated at $75.00 per foot.

g. An estimate of milling cost would depend upon many factors not now known such as ratio of concentration, required fineness of ~~ground~~ Grind etc. A lead and a zinc concentrate would be made, and possibly an iron concentrate. An estimated milling cost of $2.00 per ton would seem reasonable for a 50 ton per day plant.

h. Haulage rate to rail point, Kingman, is $1.50 per ton.

i. Freight rate on crude ore to El Paso ranges from $3.00 per ton minimum to $5.57 on ore having a net value of $31.59 per ton (shipment by Mr. Hedges). Freight on concentrates cannot be estimated without knowing the value of the concentrates. Lead concentrates would go to El Paso, Texas, and zinc concentrates would be sent to Amarillo, Texas.

j. Smelter treatment on crude ore at El Paso has ranged between $3.50 per ton minimum to $7.86 per ton (shipment by Mr. Hedges).

~~[illegible]~~. Smelter treatment charges for concentrates will vary according to the metal contents and cannot be estimated at the present time.

k. All costs per ton have been included in the above estimates.

~~l. Timber costs 65.00 per thousand in Kingman. Mature timber formerly priced at $45.00 per thousand is no longer available.~~

l. Timber prices have fluctuated widely in recent months. Oregon Pine sells for about $65.00 per thousand at Kingman, Ariz., with substantial reductions for large lot purchases. Mature Timber formerly priced at $45.00 per thousand is no longer available.

m. Total operating costs per ton (50 tons per day milling basis)

Mining and Development	6.00
Milling	2.00
Total	$8.00

~~[illegible]~~

Ore Reserves

Par 4 **Value**

Recent mining operations have aimed at a shipping product of high gold content and low zinc content. Estimation of ore reserves is based upon the proposition that the ~~mine~~ ore will be milled at the property.

~~There is no blocked out reserve for the mine.~~

Par 5 A continuous length of 70 feet of ore mostly sulphide is exposed in the north drift of the ~~Seigel workings~~ ~~material in the end of the drift~~. Sampling in the area A-A, gives an average for that place of:

Width	Oz Au	Oz Ag	% Pb	% Zn
5.35'	.43	1.28	3.17	4.29

Par 6 Sampling in the ~~area~~ area B-B, gives an average of:

Width	Oz Au	Oz Ag	% Pb	% Zn
2.1'	.45	5.76	12.40	7.55

Par 7 In order to arrive at an average value for the 70 feet of ore the above two averages are used in conjunction with samples No. 4, 11, and 18 ~~and~~ with the following result:

Width	Oz Au	Oz Ag	% Pb	% Zn
3'	.50	1.99	4.85	5.45

~~Unfortunately, I presented a more systematic sampling of this ore shoot and it seems probable that the best placers in it~~

Close timbering in the mine presented a more systematic sampling and since selective mining of the high gold bearing portion of the shoot has recently been in progress and ~~it seems probable that~~ this class of ore is better exposed. It would seem safer therefore to assign a gold value somewhere between that shown above and the average shown in Mr. Herron's report (accompanying the application) or about .4 Au.

As previously stated in this report the old workings are inaccessible. Mr. Jacobson ~~and Mr. Blackburn~~ however sampled the south end of the 100 ft level from shafts No. 1 and No. 2 (this level was open until several years ago) and it is believed that his results can be accepted with a reasonable degree of accuracy. Pb and Zn were not assayed but gold and silver values in the south 40 feet of this level showed:

Width	Oz Au	Oz Ag
4.8'	.22	4.27

The face of this 100 Ft level is approximately 30 ft north of the north face of the Segar workings and approximately 40 feet below it. The ore shoot in the Segar workings is practically all sulphide and while the north face of the drift is in oxidized material it would seem reasonable to expect sulphides to come in at a short distance below this point. Lead and zinc content in the 100 ft level are not known but since these metals occur in appreciable amounts with gold and silver in all the accessible workings it seems safe to assume that they will be present in about the same proportions on that level.

~~There would appear the to be an ore shoot~~
~~The ore shoot then would~~

The ore shoot then would appear to be a length of about 160 feet and a width of ~~somewhere on~~ 4 feet with a probable average metal content as follows:

width	Oz Au	Oz Ag	% Pb	% Zn
4.0	.31	3.23	3.86	4.25

Ore with characteristics similar to that under consideration ~~is~~ being successfully handled at the near-by Tennessee-Schuylkill mill. If recoveries of 85% ~~of the probable metals~~ ~~are~~ assumed net recovered a value for the ore of the above grade would work out about as follows: (~~after marketing cost~~)

	$
Gold	9.22
Silver	2.75
Pb @ 1¢ per unit	3.86
Zn @ 0.75¢ per unit	3.19
Net Value	$19.02
Less ~~mining~~ milling and development	8.00
Anticipated Profit	11.02

Tonnage

There is no blocked out reserve of ore in the mine. The opening of a level 100 below the present lower working should block out a minimum of 5,500 tons of ore of the grade noted above. The chances seem good for developing ~~ore south of the ore zone~~ more ore in a southerly extension of this shoot and there is

a good possibility that other lenses will be discovered in the crushed zone. ~~with the~~ Also, ~~[illegible]~~ ore of shipping grade and some will be ~~is available from~~ above the Sagar working level.

7. A. 2 miners ~~men~~ are now working on the property.

B. The proposed development would require a mining crew as follows.

1	Boss
2	Miners
2	helpers
2	hoist and compressor
2	Trainees ~~[illegible]~~
9	

~~Miners~~ wages in the district have been rising and are not yet stabilized. Present miner's wage is 6.50 per day with overtime rates of comp. for time in excess of 40 hrs per week.

C Work would be carried on at 2 shifts per day.

8. A. There are no objections to the project.

B. The project would bring out an appreciable amount of lead and zinc and with favorable results from further development could become a ~~substan~~ substantial producer of these metals.

9. A. The ~~development~~ proposed development would require about 4 months time for completion.

B. Work in the district could be carried on the year-round

C. Favorable results from development would justify a general loan for building mill.

~~10.~~

10. A. Proposed development includes sinking 100 ft of winze and drifting 500-600 ft at that level.

B. Cost of the Proposed Development Program would be about as follows:

Hoist and cable		$ 400
Sink 100 Ft winze	@ 75.00	7,500
Drift 500 Ft	@ 15.00	7,500
2 Rock Drills & mounting etc.	@ 450.00	900
~~Roof~~		
Deposit with Power Co.		350
Deposit for Compensation Insurance		1000
Supervision 4 mos @ 350		1400
Contingencies		950
		$ 20,000

C. No construction would be required

D 1. Applicant was not present to discuss the matter of supervision. He proposes, in his application, to hire a competent mining engineer and lists $350 per month as the salary to be paid.

2 Insurance, legal expense and engineering - $500

3. Compensation - approximately $200 per month

4 Interest - $600

11 E Contingencies $950

11 1 Not applicable

2 Class A loan of approximately $35,000

$$180 \times 4 \times 100$$

$$\begin{array}{r} 340 \\ \times\ 18 \\ \hline 2720 \\ 34 \\ \hline 8000 \end{array}$$

Para Sampling of the Segar workings indicates a shoot of sulphide ore in the north drift with irregular lenses of ore showing at other places in the workings. Reports by Heron, Blackburn and Gordon (accompanying the application) ~~indicate ore in the old workings~~ (now inaccessible) north of ~~the Segar workings.~~ ~~These reports~~ seem sufficiently authoritative and to contain enough checks upon each other to ~~make their acceptance appear safe as to the~~ justify acceptance of assays in the old workings (now inaccessible) north of the Segar workings. These figures together with the sampling which was done in the Segar workings indicate that the proposed development can reasonably be expected to make available upwards of 8000 tons of ore in this shoot, which, with a mill on the property would be capable of yielding a profit of around 10c per ton. The chances for developing a considerably larger tonnage in the ~~present~~ 500 feet of development on the level to be opened by the proposed mine seem very good. Also, in the above estimated reserve no account has been taken of the ore above the level in the Segar workings. This area ought to ~~be able to~~ supply a considerable amount of ore, most of it oxidized and therefore a direct shipping ore, though because of the lack of systematic development there is no ~~exact~~ basis upon which to estimate tonnages. ~~could be estimated~~.

Para While lack of continuity of ore and high mining and development cost lend some uncertainty to the project the ore values nevertheless are sufficiently high to make ~~the make~~ the project attractive. The performance of other mines in the district points to the probable increase of base metal content, particularly zinc

The Sergeant working together with the

8 4 1 mr sink
3 mrs dr.

19650

19150

9/630/189 667/100

~~12. Comments of Supervising Engineer~~

as depth is gained in the ore zone and that this increase will be accompanied by little or no falling off in gold values.

A Development loan appears to be justified.

SILVER HILL & VALLEY VIEW October 2, 1942

Chloride, Mohave Co. Elgin B. Holt

PRODUCTION POSSIBILITY SURVEY

OWNER: William S. Segar, Chloride, Arizona.

CUSTODIAN: S. M. Hedges, Chloride, Arizona. Hedges is working the mine and is making regular ore shipments. The crew consists of Hedges himself and Mrs. Hedges. Both work in the mine, doing the drilling, mucking, tramming and sorting of the ore for shipment. Mrs. Hedges is a first class driller and operates on the business end of a single Jack hammer.

METALS: Zinc, lead, copper, gold and silver.

LOCATION: This property is located at the western edge of the town of Chloride. It consists of 4 patented and 2 unpatented mining claims and one patented mill site.

DEVELOPMENT WORK: The vein strikes N. 7 degrees W., and dips steeply E. It is opened at intervals along its extent by five inclined shafts, sunk to the following depths: 78', 75', 80', and 155'; the No. 1, or main shaft, being sunk on vein to a depth of 225 feet. A cross-cut tunnel was driven by Segar some two years ago from the east side of the hill. This tunnel has a length of 400' and cuts Shaft No. 5 at 80' depth. A drift was then run north on vein 199' and south 70'. Also a winze has been started, in north drift, and is now 12' deep on vein, which is 37 feet wide. Ore occurs in lenses up to 90' long and 4' wide. Sulphide ore comes in below the said cross-cut tunnel level.

1941 PRODUCTION:

One car was shipped to Hayden smelter, and gave the following results:

Tons	Au, oz	Ag, ozs.	Cu,%	Pb,%		Net returns
36.6	0.358	2.5	0.19	3.7	————————	$217.55

1942 PRODUCTION:

During 1942, Hedges and wife have shipped three carloads of ore to the El Paso Smelting Works, with following results:

Tons	Au, oz.	Ag, ozs.	Cu,%	Pb,%	Zn,%		Net returns
42.8	0.78	3.7	0.435	5.25	3.2	————	$860.96
25.2	0.91	5.1	0.650	9.45	6.2	————	652.50
41.2	0.565	3.4	0.360	6.4	5.3	————	533.67

Also another car, consisting of 36 tons, has been shipped to El Paso, recently; but returns on the same had not been received at the time of visit, Oct. 1, 1942. Hedges states that this car should average about as follows: Gold, 0.70 oz.; silver, 5.50 ozs.; copper, nothing; lead, 12.0%; and zinc nothing.

PLANS FOR INCREASING PRODUCTION

Hedges stated that Mr. Segar is now making financial arrangements to sink a winze from the cross-cut tunnel level to a depth of 100 feet on vein and then drift on vein north 300' and south 300'. Also, that Segar plans to sink a two-compartment shaft, in hanging wall, vertically to a depth of 200', with cross-cuts to vein at 100-foot and 200-foot intervals. Then drifts would be run on vein in order to block out ore. Furthermore, that Segar is planning to erect a 200-ton selective flotation mill at property, when and if he succeeds in financing the above outlined development work. While this property has more than usual merit, it is now in the development stage; its main needs being capital with which to carry out the above plans to develop the mine in a large way and then equip it with a mill.

Elgin B. Holt.

SILVER HILL MINE

1943 PRODUCTION: The total production for 1943 is not available. However, Mr. Klein furnished me with the following record of a car load of ore shipped during the said year from an underhand stope on the sulphide ore shoot mentioned above and located in the north drift from the said cross-cut tunnel level:

Tons	Au-oz	Ag-ozs	Cu-%	Pb-%	Zn-%
49.6	0.53	4.40	0.55	8.90	6.20

ORE RESERVES

Per another assay map of this property, furnished me by Mr. Klein, there are now blocked out, more or less, in the oxidized ore zone, above the said cross-cut tunnel level, between Shafts Nos. 1 & 3, 19,700 tons of ore, averaging: Gold, 0.167 ounces, and silver, 2.55 ounces per ton; lead and zinc values not being given. However, as this ore tonnage is oxidized material, the same, of course, could not be used as a source of ore to supply any custom mill that may be erected in this area and using selective flotation, which would have to be operated on sulphide ores and not on oxidized ores.

SULPHIDE ORE RESERVES:

There are no sulphide ore reserves now blocked out in this mine. However, on the sulphide ore shoot a winze has recently been started by Mr. Klein, and which will be put down to water level in the mine, expected at from 100' to 150', before drifting on the ore vein is started, with the end in view of blocking out a considerable reserve of desirable sulphide milling ore, which should assay equal to or better than the average assays set forth in the paragraph above, captioned "ORE SHOOT".

INSERT A: On February 10, 1944, I had another interview with Mr. J. P. Klein, who was Superintendent of the Silver Hill mine at the time this report was prepared, and he informed me that later work resulted in developing about 5,000 tons of Sulphide ore assaying approximately as follows:

Zn-%	Pb-%	Au-oz	Ag-ozs
5.67	4.40	0.32	1.80

RFC LOAN: This property is now being developed by funds furnished by RFC; 12 men being employed.

ESTIMATED DAILY PRODUCTION: As stated, while there is now no sulphide ore blocked out in this property, Mr. Klein stated, in sinking the winze mentioned, around 2 tons of sulphide milling ore should be produced daily for each foot of sinking, during which time, or while the winze is being sunk to at least a depth of 100 feet, no stoping of ore could be carried on. However, after the said winze has reached around 100 feet in depth, below the cross-cut tunnel level, drifts would be run both to the north and to the south on the ore vein, and then stoping of ore could start.

In other words, it is believed that this mine can be put in shape within a period of 90 days to supply at least 25 tons of ore daily for a custom mill, while further development work is progressing. Also, within a period of one year this mine could be developed to a stage where it should produce around 75 tons daily, of ore assaying not less than: 5.67% zinc; 4.40% lead; 0.32 ounce gold; and 1.80 ounces silver, as above set forth.

/s/ Elgin B. Holt
Elgin B. Holt

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/s/ Elgin B. Holt
Elgin B. Holt

UNDERGROUND DEVELOPMENT

(Phase III)

The most favorable location for an initial mining operation is on the Little Boy and '98 Claims, located in the northwest quarter of Section 5, Township 22 North, Rnage 17 West. Several mineralized veins intersect in this area which show abnormally high gold and silver values.

The Little Boy, Goetz and '98 Shafts all penetrate mineralized veins, indicating considerable ore reserves. Values increase significantly with depth.

The '98 Shaft is approximately 100 feet in depth with short horizontal tunnels developed along the vein. Oxide ore is in place in the shaft and the tunnels are bordered by altered material. At the 100 foot level, the vein and altered material average about 3 feet in width. Assay samples across this zone gave values of 3.3 ounces gold and 23.0 ounces silver per ton. Surface exposures showed only a trace of gold and 0.78 ounces of silver, indicating increasing values with depth.

The Goetz shaft is on an extension of the '98 Vein and is reported to be about 220 feet in depth, but is caved at the 10 foot level. Assays of stockpiled ore from the 50 foot level showed values of gold ranged from 0.384 to 0.55 ounces per ton and silver ranged between 35.64 and 63.0 ounces per ton. The vein is oxidized to the 200 foot level where assay values showed gold to be 0.256 and silver 13.42 ounces per ton. At this level the vein is 2.5 feet in width. By contrast, surface samples at the Little Boy Vein had values of gold showing 0.15 and silver 1.79 ounces per ton. The vein at the surface is only one foot in width.

MANAGEMENT PROPOSAL

(602) 246-9573

D.K. MARTIN & ASSOCIATES
Mining Development & Administration

4728 N. 21st Avenue

Phoenix, Arizona 85013

OPERATIONAL EXPENSE PROJECTION

Mining on and in ore body, estimating each foot will produce 125 tons and each month containing 21 working days is the basis on which the following figures are derived:

ONE HEADING, producing 630 tons per month:

EMPLOYEES:	
Crew of 4, 21 days	$6,700
Administration: 2 @ 2 hrs/dy, 21 days	1,260
Geologist and Helper, 12 days	5,160
Subsistance: 5 @ $40/dy, 12 days	2,400
Crushing: Crew of 2, 9 days	1,440
Tabling: Crew of 2, 21 days	3,360
Employee Taxes	3,990
EQUIPMENT:	
Crusher (lease Purchase)	3,200
Compressor (lease purchase)	1,800
Drill & Accessories (lease purchase)	600
Utilities	600
Housing (rental)	300
Conveyor, slusher or tram (lease purchase)	800
Safety and Security	50
Electrical, Air, Track, Timber	230
Small Tools and Equipment	200
Assay and Metalurgical Testing	210
Transport Concentrates	
19 tons Pb to El Paso, Texas	220
27 tons Zn to Bartelsville, Oklahoma	350
LAND (monthly option)	3,300
CONTINGENCY (15%)	5,430
TOTAL COST, ONE HEADING, PER MONTH	$41,600

TWO HEADINGS, producing 1050 tons per month:

Similar to above with:	
31 tons Pb to El Paso	
43 tons Zn to Bartelsville	$54,200

NOTE: If any piece of equipment is not available on terms, capital expenditure will increase, while monthly operational expenses shall decrease.

Silver Hill

Dupl

ORIGIN OF CERTAIN RICH SILVER ORES NEAR CHLORIDE AND KINGMAN, ARIZONA.

By Edson S. Bastin.

FLOTATION TEST

Liberty Mines, Operators
Silver Hill Mines

FLOTATION CIRCUIT

	Oz Au.	Oz Ag.	% Pb.	% Zn.	% Fe	VALUE
HEAD ASSAY	0.38	3.46	4.8	5.7	9.3	
PB CONCENTRATES	3.11	29.44	56.3	3.9	8.8	
ZN CONCENTRATES	0.37	2.79	0.5	55.2	7.6	
TAILING ASSAY	0.11	0.73	0.2	0.6	8.7	
EXTRACTION	71.1	78.1	95.8	39.5		

TABLE CIRCUIT

HEADS	0.11	0.73	0.2	0.6	8.7
CONCENTRATES	2.43	6.09	0.1	0.2	61.9
TAILINGS	0.04	0.28	0.1	0.4	6.4
TOTAL EXTRACTION - Au. & Ag - %	89.5	93.0			
CONCENTRATION RATIO - (Approximate)	11	11	12	10	
TOTAL EXTRACTION - BOTH CIRCUITS	89.5	93.0	95.8	89.5	

REAGENTS

PB CIRCUIT - PH 8.6	Pounds per dry ton	Remarks
Zn SO4	1.1	
Ca CO3	—	Determined by pH
Reagent 241	.12	
Pine Oil	.05	
Zn Circuit - pH 10.4		
Cu SO4	1.3	
Ca CO3		Determined by pH

REAGENTS CONT'D

ZN CIRCUIT - pH 10.4	Pounds per dry ton	Remarks
Pentasol Amyl Xanthate	.20	
Dupont Frother B-23	.03	

FLOTATION CIRCUIT DENSITY, by Weight, - 3.9 to 1

Weight of Test Samples - 1000 gms.

Computations based on 100 tons

NOTE:

A third selective flotation product for the iron and gold content of the tailings is inadvisable, as most of the iron is barren, and a tabling process will prove more efficient, as well as less costly.

/s/ J. N. SHARPE

Metallurgist.
Tennessee Schuylkill Corp.
Chloride, Ariz.

Sept. 10, 1943

Second Loan Application - 9/10/43
Silver Hill Mine - $30,000. — Dupe
Balance of data on printed forms - Submitted

Sept.10,1943.

Reconstruction Finance Corp;
Washington,D.C.

Re:Wm.S.Segar;Docket 4276

Gentlemen;

During early July,1943 a $20,000 development loan was granted to Wm.S.Segar on the Silver Hill mine in Chloride, Arizona.Liberty Mines,as operator,started work about the middle of July,1943 upon above property and have,as of Sept.1, 1943 made the following expenditures thereon:

Rehabilitation of Mine;Equipment,Water Supply; Bldgs and Powder Magazine; ----------	$7534.31
Underground Work;	
20 feet of Raise for winze headworks; ----	700.00
107 feet of Winze sinking;----------	6200.00
Total expenditures to Sept.1 ------	$ 14434.31
Balance in Trust Fund Sept.1;------	$ 5565.69

At the present rate of expenditures this balance will last until about Sept.25,1943.

Owing to the excellent showing of ore,disclosed by the work to date,we feel that further expenditures are more than justified and are therefore making application for an additional $30,000 loan to continue the development of this promising ore body.

After the rehabilitation of the mine,a winze was started near the north end of the Segar Adit level.This winze, 7 x 9 ft in clear of timbers (8 x 10 ft;rock section) was sunk during August,to a point 110 feet below the floor of the Segar Adit,with an average dip of 47 degrees.This work produced about 587 tons of ore and 97 tons of waste.At a depth of 50 feet below the collar of the winze the hangingwall of the ore flattened and passed into the back of the winze?Had this ore been taken out during the course of the sinking,judging from the drill holes samples,it would have yielded some 180 tons of ore (4.4'x 10'x 45'),assaying 0.34 Au; 3.5 Ag;4.2% Pb and 4.4% Zn.Out of the 587 tons of ore actually taken out of the winze,some 155 tons were shipped to Midvale,Utah;judging from our sampling this ore had an average assay of 0.33 Au; 4.4 Ag; 3.3% Pb; 6.1% Zn.The remaining 432 tons of ore was stock piled and judging from many samples,both grab and channel,had an average content of 0.25 Au; 2.0 Ag; 2.4% Pb; 4.8% Zn. Thus the weighed average of the ore removed from the winze, together with that that dipped out of the opening,was 0.28 Au; 2.8 Ag; 3.0%Pb; 4.9% Zn.This grade of ore with a zero quota and A-B-C premiums on lead and zinc would have a gross assay value as follows;

Gold; 0.28 @ $35.00 ----------	$ 9.80
Silver;2.8 @ 0.71 ----------	1.99
Lead;3.0%; 60 lbs @ 0.12-------	7.20
Zinc;4.9%; 98 lbs @ 0.165-------	16.17
	$ 35.16

Under our contract with the U.S.Smelt.Refin;& Mng.Co; a copy of which is enclosed,we would realize with premiums on the above ore; ----------$21.23

Less Treatment ---------	3.25	
" Haul to Kingman ---	1.50	
" Frt to Midvale ---	5.00	9.75
Mill net,after all charges;--		$ 11.48

With a local mill getting only the recoveries as paid for at Midvale and with a milling cost of $2.00 per ton, the mill net on the above ore would be $19.23.With a mining and development cost of $10.00 per ton the profit would be about $9.00 per ton of ore.

The widths of ore exposed in the winze ranged from of 12 feet to a minimum of 4 feet,with an average of about 7.5 ft. This ore is exposed along the Segar Adit level for a distance of 110 feet,60 feet to the south and 50 feet north of the winze to the face of the drift.Judging from the assay maps of R.C.Jacobson and R.D.Leisk of the old 100 ft level from No.1 shaft (Now inaccessible),this ore shoot could persist for another 200 feet north of the face of the Segar Adit level. The ore shoot thus has a possible or indicated length of some 300 feet.Should it be found to have a length of 200 feet and with an average width of 7.5 ft;it would produce about 125 tons per foot of depth.Should the porposed development program,here in outlined,prove successful,it would on the above basis,put in sight about 28,000 tons of ore.

In many respects,geolgically the neighboring Tennessee-Schuylkill and the Silver Hill properties are comparable.They are parallel fissures about one mile apart. Both are heavily crushed zones in pre-Cambrain crystalline rocks.The Tennessee fissure is traceable for nearly two miles,the Silver Hill is exposed along the outcrop for some 4000 feet.The vein filling of both are identical,comprised of a strong gouge on both walls between which occur pyrite, galena,sphalerite and small amounts of chalcopyrite in a gangue of quartz and soft altered fragments of wall rocks. Minable ore bodies in the Tennessee range from 2 to 14 feet in width.Along the strike four ore shoots,attaining stope lengths up to 600 feet,have been mined to a maximum depth of 1600 feet.The longitudinal limits of the ore down the pitch can be predicated fairly accurately,with slight if any changes in grade of ore between succeeding levels.

In 1938 the Tennessee mined and milled some 54,000 tons of ore having an average metal content of about; 0.20 Au; 2.1 Ag; 3.6% Pb; 5.7% Zn.Making a lead-iron concentrate and a zinc concentrate,the flotation plant recovered about 95 % of the gold;94 % of the Silver;94 % of the lead and 72 % of the zinc (in the zinc concentrate).

Exhibit A

10. Proposed Work;

By the time (Sept.25th) that the present funds are exhausted it is estimated that about 80 feet of drifting will have been accomplished on the first level below the Segar Adit.As it is proposed to do about 250 feet of lateral work on this new level,altogether,there would thus be left about 170 feet.Cost of drifting and cross cutting is estimated at $18.00 per foot;thus

170 feet of lateral work at $18.00 ---------- $3060.00-(200 Ft. LEV.)

Should this work prove satisfactory it would then be necessary to raise to the Segar Adit level,estimated as;

130 feet of raise @ $35.00 per ft.---------- 4550.00

Then raise from the top of the present winze through to the surface,to serve as working shaft,estimated as;

60 feet of raise @ $35.00 per ft;----------2100.00

Equip at the surface of the new shaft,as follows;

Headframe & Bins;----------	1300.00
Hoist & Compressor Bldg; ----------	750.00
Moving & erection of hoist; ----------	200.00
Moving & erection of compressor,from the Alvarado mine; ----------	550.00
Extension of Power Line;----------	100.00
Water Supply to new site;----------	200.00

Then sink the present winze from 130 ft below the Segar Adit to a point 250 feet below the adit level,this would allow a sump 20 feet deep.

120 feet of Shaft @ $60.00 per ft;----------7200.00

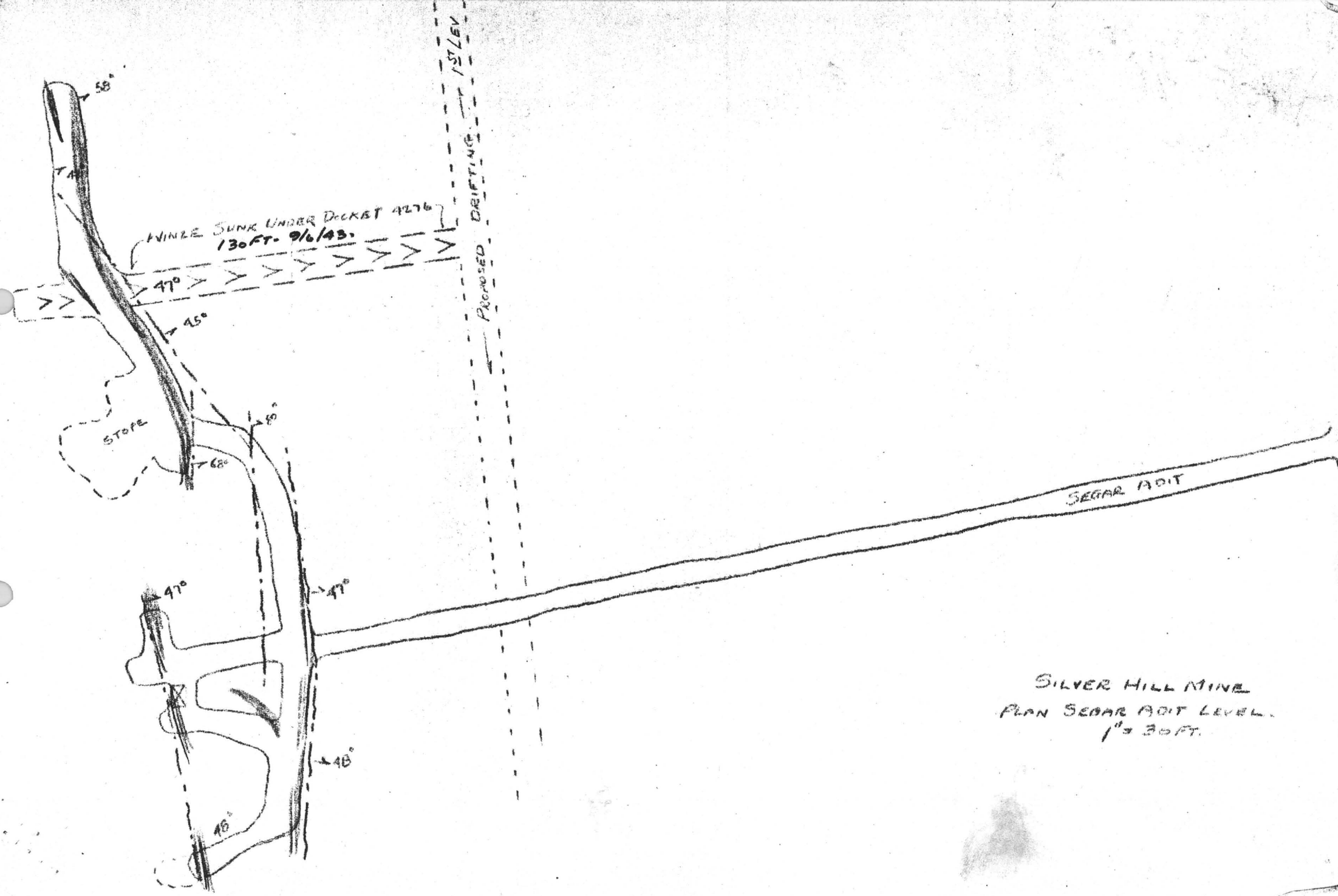
Then from a pint 230 feet below the adit level,open another level (this would be the 300 Ft level measured from the outcrop) by some 250 feet of drifting and cross cutting;

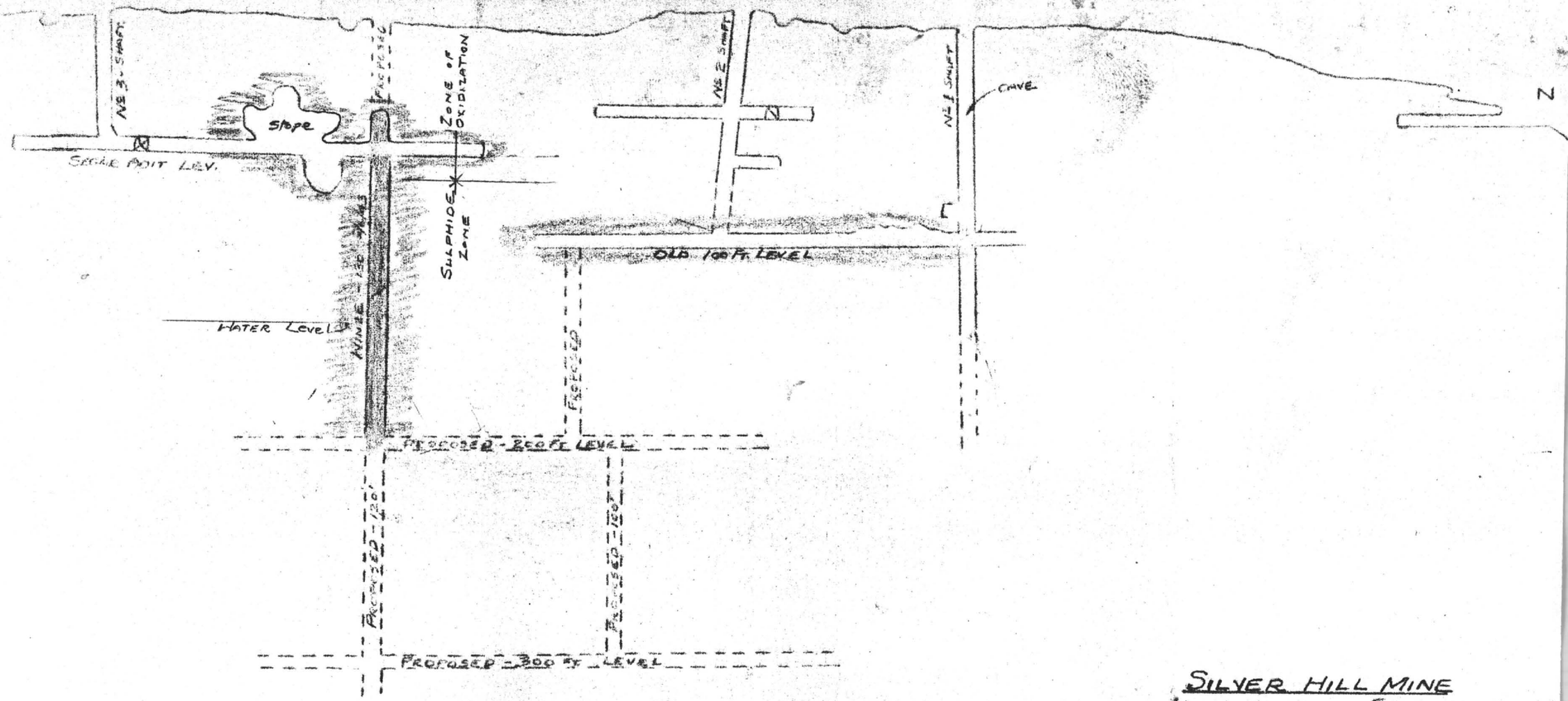
250 feet of lateral work @ $18.00 ---------- 4500.00-(300 Ft. LEV.)

Then 100 feet of raise, 300 to 200 level;-------- 3500.00

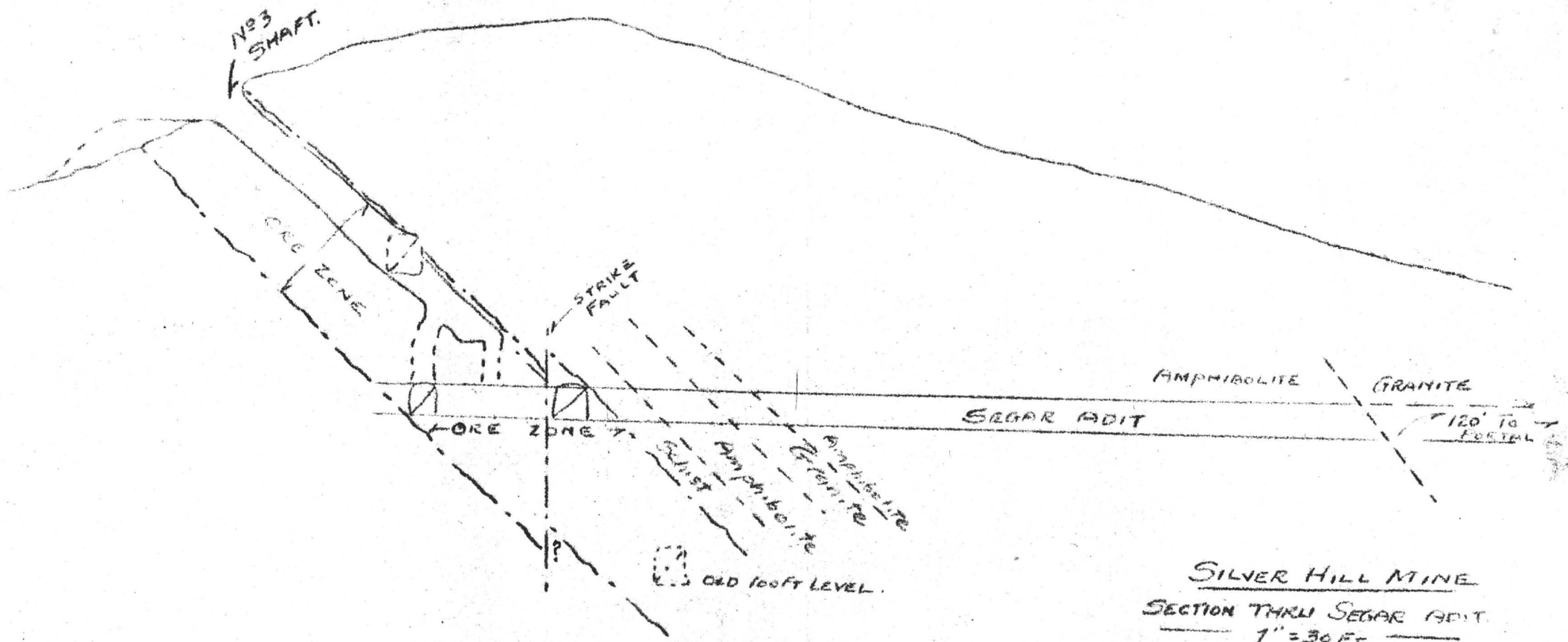
Contingencies; ---------- 1990.00

$ 30,000.00


58°
WINZE SUNK UNDER DOCKET 4276
130 FT. 9/6/43.
47°
45°
STOPE
60°
68°
1ST LEV
PROPOSED DRIFTING
SEGAR ADIT
47°
47°
48°
48°
SILVER HILL MINE
PLAN SEGAR ADIT LEVEL.
1" = 30 FT.



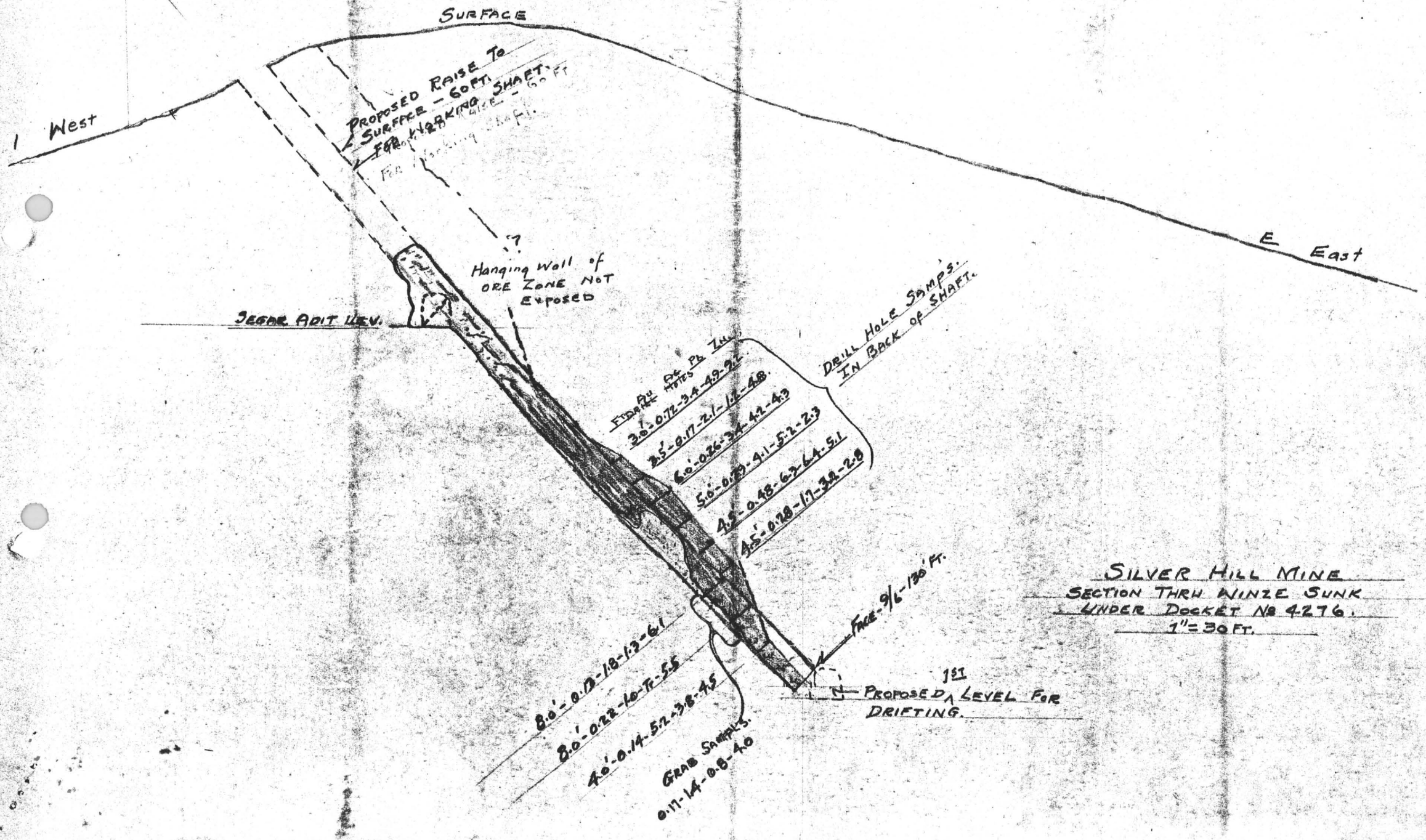
SILVER HILL MINE
LONGITUDINAL SECTION
1" = 60 Ft.



SILVER HILL MINE

SECTION THRU SEGAR ADIT

1" = 30 FT.

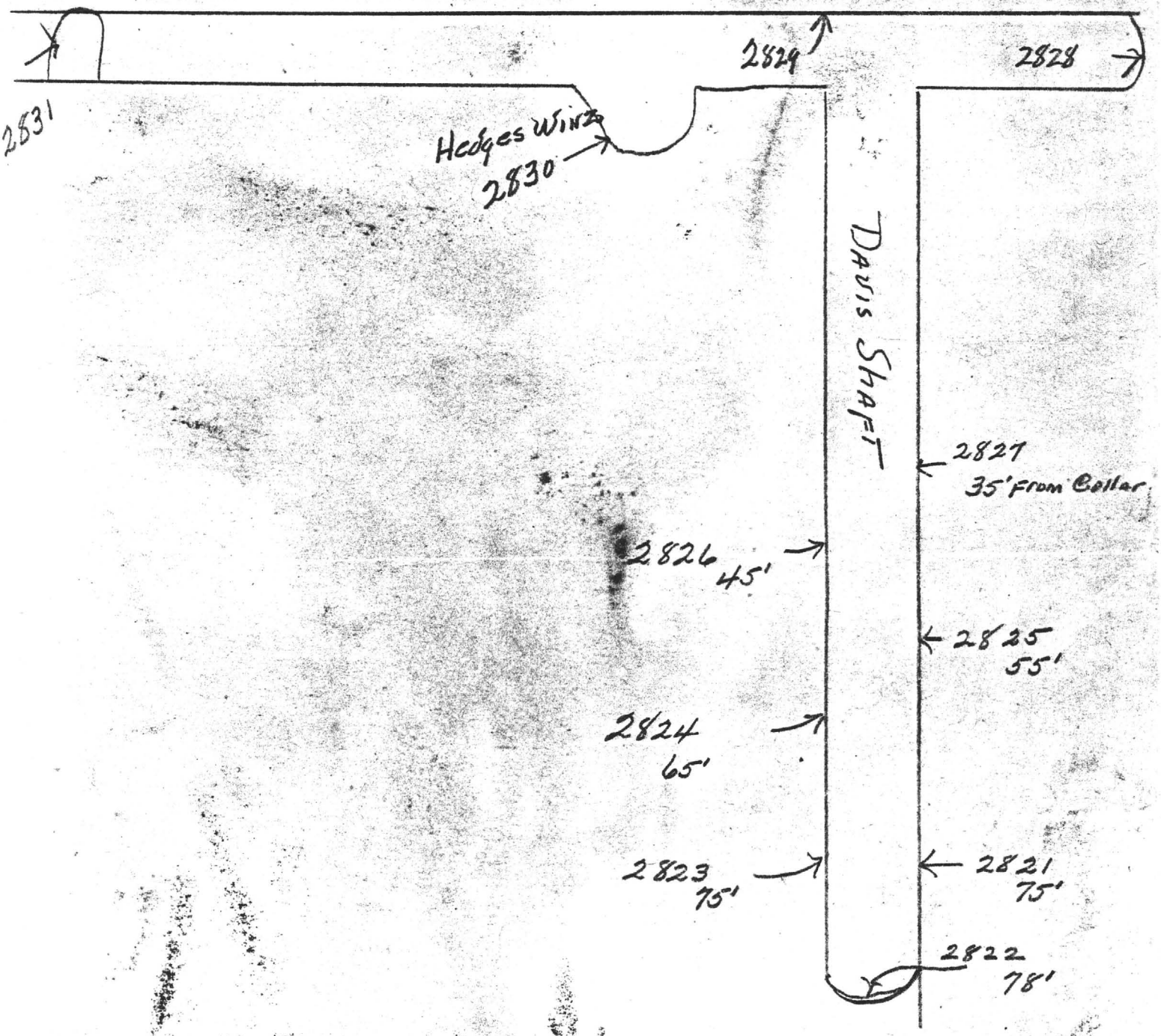

SURFACE
West
East
PROPOSED RAISE TO SURFACE - 60 FT.
FOR HOISTING SHAFT.
Hanging Wall of ORE ZONE NOT EXPOSED
JEGAR ADIT LEV.
DRILL HOLE SAMPS. IN BACK OF SHAFT.
3.0'-0.72-3.4-4.9-9.2
2.5'-0.17-2.1-1.2-4.8
6.0'-0.26-3.4-4.2-4.3
5.0'-0.29-4.1-5.2-2.3
4.5'-0.48-6.2-6.4-5.1
4.5'-0.28-1.7-3.8-2.8
FACE-9/6-130 FT.
8.0'-0.13-1.8-1.3-6.1
8.0'-0.22-1.0-7.-5.5
4.0'-0.14-5.2-3.8-4.5
GRAB SAMPLES.
0.17-1.4-0.8-4.0
PROPOSED 1ST LEVEL FOR DRIFTING.
SILVER HILL MINE
SECTION THRU WINZE SUNK
UNDER DOCKET No 4276.
1" = 30 FT.

Si

Min. Trans., Vol. 30, 1999, pp. 1044–1054.

by Bur[illegible] of Mines
July 1943.

No.	Width	Pb	Zn	Cu	Au	Ag
282I	6.0 ft	2.3	3.6	.03	.I85	I.2
2822	4.5	2.6	3.8	.03	.I25	2.95
2823	5.5	0.4	0.I	--	.045	0.05
2824	5.2	4.3	5.4	.09	.26	2.I5
2825	5.3	6.9	6.5	.02	.255	2.85
2826	6.0	I.4	3.7	.03	.73	I.I0
2827	5.2	2.6	6.7	.20	.935	2.35
2828	4.0	0.3	0.I	.03	.005	0.40
2829	2.3	0.2	0.I	.02	.005	0.50
2830	5.2	7.I	3.2	.47	.36	3.95
283I	2.8	0.2	2.6	.02	.09	0.60



RECONSTRUCTION FINANCE CORPORATION
Mining Division

Report of Supervising Engineer

SILVER HILLS MINE

Docket No.	B-ND-4276
Date Authorization for Exam Received	July 20, 1942
Date of Examination, includes	August 15-16
Date of Report	

1. Name of Applicant	William S. Segar
Address	P. O. Box 243
City & State	Chloride, Arizona
Correspondent	William S. Segar c/o Sidney Rosenbaum 76 Williams Street New York City, New York

2. Character of Project:

Development of Zinc-Lead-Gold-Silver property

3. Location of Mine:

The mine is located in Sections 4, 9, and 10, Township 23 North, Range 18 West, G&SRB&M in Mohave County, Arizona. The mine is on the western edge of the town of Chloride, and is 22 miles North by highway from Kingman, Arizona, the nearest rail point and supply center.

4. Applicant:

The applicant was not present during the examination. Mr. Hedges, the custodian of the property, is fully conversant with the situation and acted as guide and helper. The applicant, Mr. Segar, is not a mining engineer, but appears to have had considerable experience with the business details of mining. He formerly was connected with mining development in Wyoming. He expresses the intention, in his application, to place the mining operations in the hands of a competent mining engineer, and to handle the business details himself. Mr. Hedges has taken care of the development to date for Mr. Segar, and is now mining and shipping from the property.

Mr. Hedges retains the proceeds from these shipments in return for maintaining the workings, and as payment on account for past services. Mr. Hedges, while not a mining engineer, is a competent practical miner with an intelligent understanding of mining problems. He has had charge of mining work, and has been a successful lessee in various mining camps.

5. Loan Requested:

   $20,000.00

6. A. General Features:

   1. There are no mine workings, etc. which are not confined within the applicant's ownership.

   2. Proposed project would comply with State Compensation and safety-first statutes.

   3. There are no apparent legal discrepancies in the project.

   4. There are no impeded right-of-way facilities.

   5. There is no likelihood of surface or sub-surface trespass.

   B. Existing Development:

   1. Mine is opened by shaft and tunnel.

      a. Complete maps are included in the data supporting the application. Compass and tape survey (attached herewith) was made of the present active workings.

      b. Samples were cut with pick and moil, and gathered on canvass. The winze openings are timbered and closely logged, and the vein material, therefore, is frequently not visible.

      c. The major part of the workings are inaccessible. Those parts of the mine workings confined within the applicant's recent development were accessible and generally in good condition.

      d. The property comprises four patented lode claims and one mill site, also, one unpatented lode claim. All are held by the applicant under lease and option to purchase. History, description of claims, pro-

B.1.d (cont.) perty ownerships and lease agreements, and detailed regional geology are adequately covered in the several reports which are submitted as supporting data with the application.

The Silver Hills Mine is located on a low hill on the Western edge of the town of Chloride. The Silver Hills vein occurs as a broad crushed fracture zone (20-40 feet wide) along a contact between granite amphibolite schist. The filling of the crushed zone is a generally silicified rhyolite porphyry. The material has been subjected to intense repeated movement which has resulted in a ground crushed mass with numberous faults and gouge seams. Pronounced slickensiding is common, and in places the silicified material has been reduced to a fine sand or powder. The general direction of the movement is parallel to the strike and dip of the contact though there are many cross faults which, however, do not penetrate the limiting walls of the crushed zone. Ore occurs in thin lenses scattered in a random manner throughout the zone, and while there is a general tendency to conform with the dip and strike of the contact, frequently, lenses are found lying at varying dips and strikes across the zone. The lenses generally lack continuity, though continuity, as has been noted, occurs at or near one or other of the limiting walls of the crushed zone.

Fremont Note
to determine

The ore minerals are gold, silver, lead, and zinc with minor amounts of copper. The material at the surface and in the upper part of the mine is oxidized. The history of development in the district indicates that sulphides begin to appear at shallow depth and that at depths of several hundred feet, the mineralization is practically all sulphide. The water level in the old Silver Hills workings is reported to occur at approximately 150 feet from the surface on the slopes of the fracture zone. The Segar workings appear to have been developed near the lower limit of the transition zone between oxidized and sulphide mineralization. Sphalerite is quite common in the upper part of the workings, and galena and pyrite begin to appear at about the level of the cross cut and main drifts. 70'

The early development is described in the reports submitted with the application. These old workings are all caved and inaccessible. The Segar workings

B.1.d. (cont.) comprise a 335 foot crosscut to the foot wall of the crushed zone, 200 feet of drift development in the zone, and a 40 foot raise connecting with the bottom of the Old No. 3 shaft.

Mr. Segar's production includes about 300 tons derived in part from development on the level, but chiefly from stopping near the foot of the Old No. 3 shaft, and four carloads shipped during the past year by Mr. Hedges from several small stopes above and below the level. The 300 tons were run through a leased mill and averaged .296 ounces of gold and 2.24 ounces of silver. Head assays for lead and Zinc were not run. The concentrates ran: Lead - 12.60% and Zinc - 5.3%, and the ratio of concentration was 4.87 to 1. Recoveries of lead and zinc are not known, but since the material was mixed oxidized and sulphide ore, they were probably low, and lead and zinc in the heads are estimated to have run around 5% lead and 2% zinc. Settlement sheets for Mr. Hedges shipments are attached to the report. The material was mined intermittently by Mr. Hedges and his wife, and was sorted up to grade.

The following is a description of the Segar workings and the sampling:

Sample #9 in the north face of the level was cut across 26". The material was all oxidized and the sample included several inches of reddish-yellow material against the hanging wall which panned considerable coarse free gold. This latter material shows several feet of length, and is not visible in the back of the drift at this point. Sample #8 was cut on the east wall of the drift 10 feet back from the face. The working place here is not timbered, and the floor is covered with caved material. It was not possible to get a sample out of the back because of the unsafe condition of the ground.

At 20 feet south from the face, a fault cuts diagonally across the drift. The material north of the fault is all oxidized, while south of the fault, oxidation is only partial. Sample #4 south of the fault showed considerable sphalerite with galena and cerrusite.

Samples #5, #6, #7 and #10 were cut in a stope which Mr. Hedges had opened at this point. He reported that he removed 38 tons from here which

B.1.d. (cont.) were included in a car sent to El Paso which assayed as follows:

Oz. Au	Oz. Ag	% Pb	% Cu	% Zn
.78	3.7	5.25	.435	3.2

The total payment for metals was $32.89 per ton (including bonus for lead) of which gold and silver accounted for $27.08. Shipper's net was $25.39 (including bonus for lead). The ore here rolled over the drift and made a good bunch in the hanging wall and just below the drift. Some sorting was done to make the grade for this car.

Twenty feet south of the above described workings, Mr. Hedges opened another small stope below the level. Samples #1, #1A, #2, and #3 show narrow widths of sphalerite, galena and heavy iron sulfide with some carbonates of lead and zinc. Mr. Hedges stated that 16 tons from here were contained in a car that assayed:

Oz. Au	Oz. Ag	% Pb	% Cu	% Zn
.915	5.15	9.45	.65	6.2

Some sorting was done in making up this car. Sample #19 (corrected to a width of 32") across the dip of the vein showed sphalerite and a little galena and cerrusite. Timber and muck on the side prevented taking a sample north of #19 on the drift, but #11 was cut in a cased area above the drift. The ground here is jagged and very loose, and has caved out over a wide area.

South and above Sample #19 a stope has been opened for approximately 25 feet on the slope above the top of the drift and a length on strike of 20 feet. Samples #12, #13, #14, #15, #16 and #18 (on the level) show 20" to 36" of oxidized ore with some sphalerite. A muck sample (#17) represented 10 or 12 tons of broken ore in the chute and on the floor of the stope. Mr. Hedges stated that 14 tons of ore from here were included in a 41 ton car which assayed as follows:

Oz. Au	Oz. Ag.	% Pb	% Cu	% Zn
.565	3.4	6.4	.36	5.3

The material from this working place was rather closely sorted for shipment.

B.1.d. (cont.) South from #18, the material in the drift was either not worth sampling or could not be examined because of timbering and muck.

Sample #20 was taken from a small hole gouged in the floor, and showed sphalerite and small amounts of galena with iron sulphide.

note Sampling and inspection of the south area does not indicate the presence of a worthwhile body of ore.

Sample #26 was cut on a pillar and showed oxide ore in a vein which apparently strikes across the crushed zone, but because of the close timbering in the area, the extent of this showing could not be determined.

Samples #25 and #27 were taken across a lens lying near the footwall of the crushed zone. The vein above Samples #26 and #27 was partially stoped and produced most of the 300 tons of ore referred to above. Mr. Hedges is mining in this area at the present time, and Sample #28 represents the material which he is hauling. He screens and sorts the material closely.

Sample #29 was cut in the wall of Old #3 shaft. The material here is all oxidized.

The report by Mr. Jacobson, which is included among the applicant's supporting data, lists the various dumps together with assays and tonage estimates.

Dump samples #30 (at #1 shaft) and #31 (at the smelter site) were taken as a check on these figures and also to determine lead and zinc content, which was not previously reported. The assays check within reasonable limits with the gold and silver values obtained by Mr. Jacobson. The material on the dumps is mostly oxidized, though some sphalerite is visible particularly in the dump represented by Sample #31. Since the time of Mr. Jacobson"s examination, a nearby operator removed several hundred tons from the various dumps and attempted (unsuccessfully) to cyanide it.

note

C. Proposed Development: (See attached sheet)

1. Applicant proposes to sink a winze 100 feet below the present drift level in the north end of the

C.1. (cont.) mine and open a new level with 600 feet of drifting from that point.

2. Applicant is not mining at present. Former stope operations were cut and fill, and continuation of this method of mining is recommended.

D. Equipment:

1. Equipment on the property consists of:

210 cu. ft. Chicago Pneumatic Compressor
40 hp motor
4 room cottage
Blacksmith shop
Compressor house
1 - 16 cu. ft. mine car
2 - small water tanks
Windmill
4' x 8' Air Receiver
550 ft. of 10 lb. rails
300 ft. 4" pipe
450 ft. 2" pipe
460 ft. 1-1/2" pipe
600 ft. 3/4" pipe
100 gal. pressure tank

2. There is no mill on the property. A test run in a leased mill on a nearby property showed an extraction of 88% of the gold and 84% of the silver. The run was made on material which was largely oxidized, and no attempt was made to determine recoveries on lead and zinc. The nearby Tennessee-Schuykill mill, a different flotation plant, makes a lead concentrate and a zinc concentrate with satisfactory recoveries for each of the metals.

3. Not applicable.

4. Equipment and supplies required would include:

Hoist and cable
2 - Rock drills
Rail
Timber
Pipes
Tools and general supplies

5. Not applicable.

6. Buildings on property are in good condition.

6.D. (cont.)

7. The mine is in the town of Chloride, and living accommodations would not have to be provided at the mine.

8. No further recommendations.

E. Cost Estimates:

1. Successful operation of the property would require milling of the ore on the property or at a nearby location.

a. Mining cost would be high because of (1) the narrow width of the ore, (2) the soft crushed nature of the ground, (3) a high development cost because of the lack of continuity and irregular occurance of the ore lenses in the crushed zone. In view of the above, and in the absence of a satisfactory performance record in the mine, an estimate of mining and development costs is difficult. Allowance must be made for rapidly rising unit costs for labor and supplies. This engineer would venture an estimate of mining costs as follows (based upon a minimum output of 50 tons per day):

Mining	$ 4.00
Development	2.00
Total	$ 6.00 per ton

b.c.d. Cost for drifting, cross-cutting and raising is estimated at approximately $15.00 per foot.

e. Cost for sinking a single compartment winze is estimated at $30.00 per foot.

f. Cost for sinking of a two-compartment shaft is estimated at $75.00 per foot.

g. An estimate of milling cost would depend upon many factors not now known, such as ratios of concentration, required fineness of grind, etc. A lead and a zinc concentrate would be made, and possibly an iron concentrate. An estimated milling cost of $2.00 per ton for a 50 ton per day plant would seem reasonable. Consideration might be given to shipping the product to a

6.1.g. (cont.) custom mill. There are no local custom plants, however, and transportation costs to plants in Utah and New Mexico would be prohibitive except for the better grade portions of the ore body. Freight rate to the Midvale Plant of the U.S. Smelting & Refining Co. is $4.51 on $20.00 ore, and trucking to Kingman would cost $1.50, or a total of $6.01 for transportation. Milling charge would be $3.00 per ton.

h. Haulage rate to rail point, Kingman, is $1.50 per ton.

i. Freight rate on crude ore to El Paso ranges from $3.00 per ton minimum to $5.57 per ton on ore having a net value of $31.59 per ton (shipment by Mr. Hedges). Freight on concentrates cannot be estimated without knowing the value of the concentrates. Lead concentrates would go to El Paso, and Zinc concentrates would be sent to Amarillo, Texas.

j. Smelter treatment on crude ore at El Paso has ranged between $3.50 per ton to $7.86 per ton (shipment by Mr. Hedges).

k. All costs per ton have been included in the above estimates.

l. Timber prices have fluctuated widely in recent months. Arizona Pine sells for around $65.00 per thousand at Kingman, Arizona, with substantial reductions for large lot purchases. Native timber, formerly priced at $45.00 per thousand, is no longer available.

m. Total operating costs per ton (50 tons per day milling basis):

Mining and Development	$ 6.00
Milling	2.00
Total	$ 8.00

ORE RESERVES:

Value:

Recent mining operations have aimed at a shipping product of high gold content and low zinc content. Estimation of ore reserves is based upon the proposition that the ore will be milled at the property.

A continuous length of 70 feet of ore, mostly sulphide, is exposed in the north drift of the Segar workings. Sampling in the area A-A, gives ore averages for that place of:

Width	Oz. Au	Oz. Ag	%Pb	%Zn
5.35'	.43	1.28	3.17	4.29

Sampling in the area B-B gives an average of:

Width	Oz. Au	Oz. Ag	%Pb	%Zn
2.1'	.45	5.76	12.40	7.55

In order to arrive at an average value for the 70 feet of ore, the above two averages are used in conjunction with samples #4, #11, and #18 with the following results:

Width	Oz. Au	Oz. Ag	%Pb	%Zn
3 ft.	.50	1.99	4.85	5.45

Close timbering in the mine presented a more systematic sampling, and since selection mining of the higher gold bearing portions of the shoot has recently been in progress, this class of ore is better exposed. It would seem safer, therefore, to assign a gold value somewhere between that shown above, and the average shown in Mr. Herron's report (accompanying the application), or about .4 ounces gold. Note

As previously stated in this report, the old workings are inaccessible. Mr. Jacobson, however, sampled the south end of the 100 foot level from shafts #1 and #2 (this level was open until several years ago), and it is believed that his results can be accepted with a reasonable degree of accuracy. Lead and Zinc were not assayed, but gold and silver values in the south 40 feet of this level showed:

Width	Oz. Au	Oz. Ag
4.8'	.22	4.27

Ore Reserves (cont.)

The face of the 100 foot level is approximately 30 feet north of the north face of the Segar workings, and approximately 40 feet below it. The ore shoot in the Segar workings is practically all sulphide, and while the north face of the drift is in oxidized material, it would seem reasonable to expect sulphides to come in at a short distance below this point. Lead and Zinc content in the 100 foot level are not known, but since these metals occur in appreciable amounts with gold and silver in all the accessible workings, it seems safe to assume that they will be present in about the same proportions on that level.

The ore shoot then would appear to have a length of 160 feet and a width of 4 feet with a probable average metal content as follows:

Width	Oz. Au	Oz. Ag	% Pb	% Zn
4.0'	.31	3.23	3.86	4.25

Ore with characteristics similar to that under consideration is being successfully handled at the nearby Tennessee-Schuykill mill. If recoveries of 85% ore are assumed, then the net recovered follows: (After marketing cost)

Gold	$ 9.22
Silver	2.75
Lead @ $1.00 per unit	3.86
Zinc @ $0.75 per unit	3.19
Net Value	$ 19.02
Less mining, milling & development	$ 8.00
Anticipated Profit	$ 11.02

TONNAGE:

There is no blocked out reserve of ore in the mine. The operation of a level 100 feet below the present Segar workings should block out a minimum of 5,500 tons of ore of the grade noted above. The chances seem good for developing more ore in a southerly extension of this shoot,

Tonnage (cont.)

and there is a good possibility that other lenses will be discovered in the crushed zone. Also, oxidized ore of shipping grade and some mill ore is available above the Segar working level.

7. A. Two (2) mines are now working on the property.

B. The proposed development would require a mining crew as follows:

1 - Boss
2 - Miners
2 - Helpers
2 - Hoist and Compressor
2 - Trainees
9

Wages in the district have been rising and are not stabilized. Present miners' wage is $6.50 per day with over-time rates for time in excess of 40 hours per week.

C. Work should be carried on at two shifts per day.

8. A. There are no objections to the project.

B. The project would bring out an appreciable amount of lead and zinc, and with favorable results from further development could become a substantial producer of these metals.

9. A. The proposed development would require about four months time for completion.

B. Work in the district can be carried on the year around.

C. Favorable results from development would justify a general loan for building a mill.

10. A. Proposed development includes sinking 100 feet of winze and drifting 500-600 feet at that level.

B. Cost of the proposed development program would be as follows: (approximately)

10.B. (cont.)

Hoist and Cable	$ 4.00
Sink 100 ft. Winze @ $75.00	7,500.00
Drift 500 ft. @ $15.00	7,500.00
2 - Rock Drills, Mountings, etc. @ $450.00	900.00
Deposit with Power Company	350.00
Deposit for Compensation Insurance	1,000.00
Supervision 4 months @ $350.00	1,400.00
Contingencies	950.00
	$ 19,604.00

C. No construction would be required.

D. 1. Applicant was not present to discuss the matter of supervision. He proposes, in his application to hire a competent mining engineer, and lists $350.00 per month as the salary to be paid.

2. Insurance, legal expense and engineering: $500.00.

3. Compensation - approximately $200.00 per month.

4. Interest - $600.00.

E. Contingencies - $950.00.

11. 1. Not applicable.

2. Class A Loan of approximately $35,000.00.

12. Comments of Supervising Engineer:

Sampling of the Segar workings indicates a shoot of sulphide ore in the north drift with irregular lenses of ore showing at other places in the workings. Reports by Herron, Blackburn and Jacobson (accompanying the application) seem sufficiently authoritative and to contain enough checks upon each other to justify acceptance of assay in the old workings (now inaccessible) north of the Segar workings. These figures together with the sampling which was done in the Segar workings indicate that the proposed development can reasonably be expected to make available upwards of 8,000 tons of ore in this shoot which, with a mill on the property, would be

12. (cont.)

capable of yielding a profit of around $10.00 per ton. The chances for developing a considerably larger tonnage in the 500 feet of development on the level to be opened by the proposed winze seems very good. Also, in the above estimated reserves, no account has been taken of the ore above the level in the Segar workings. This area should supply a considerable amount of ore, most of it oxidized and therefore a direct shipping ore, though because of the lack of systematic development, there is no basis upon which to estimate tonnage.

While lack of continuity of ore and high mining and development cost lend some uncertainty to the project, the ore values are sufficiently high to make the project attractive. The performance of other mines in the district points to the probable increase of base metal content, particularly zinc, as depth is gained in the ore zone, and that this increase will be accompanied by little or no falling off in gold values.

A development loan appears to be justified.

SILVER HILLS MINE

The mine is located on a low hill near the western edge of Chloride in Secs. 4, 9 and 10, T. 23 N., R. 18 W. The property consists of 4 patented claims and 1 millsite.

The country rock consists of pre-Cambrian granite, schist and gneiss intruded by pegmatites, rhyolites and younger granites. The Silver Hills vein occurs as a broad crushed fracture zone; 20-40 feet wide, along a contact between granite and amphibolite schist. The filling of the crushed zone is generally a silicified rhyolite porphyry. Repeated and intense movement along the zone has resulted in a grainy crushed mass with numerous faults and gouge seams. The dip of the vein is 47 degrees easterly.

Ore occurs in the thin lenses scattered in a random manner throughout the zone. Although the lenses conform with the dip and strike of the contact, here and there lenses are found lying at varying dips and strikes across the zone.

The ore minerals are gold, silver, lead and zinc with minor amounts of copper. Ore at the surface and in the upper part of the mine is oxidized. The Silver Hill workings appear to have been developed near the lower limit of the transition zone between oxidized and sulfide mineralization. Sphalerite is common in the upper part of the workings and galena and pyrite begin to appear at about the level of the crosscut and main drifts.

The mine is developed by five shafts ranging in depth from 100 feet to 220 feet with a distance of 360 feet between Nos. 1 and 3 shafts. Extending from these shafts are about 450 feet of drifting and some crosscutting on the 50 and the 100 foot horizons. The south end of the property, which is developed by two shafts sunk to the 100 level, is caved and inaccessible. Mr. Segar's production prior to 1943 includes about 300 tons derived chiefly from stoping near the foot of the old No. 3 shaft. The 300 tons were run through a mill and averaged .296 oz au, 2.24 oz ag and probably 5% Pb and 2% zn.

By October 13, 1943 the winze had been sunk 144 feet and drifting advanced 125 feet north. Drifting on this level has developed a continuous shoot of ore 132 feet in length and about 5 feet in thickness. The ore shoot fades out in the south drift at 12 feet from the shaft.

The attached table shows the production from the property under RFC.

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RECONSTRUCTION FINANCE CORPORATION
MINING DIVISION
SUPERVISING ENGINEER'S PROGRESS REPORT

Docket No. B-ND-4276
William S. Seegar
Date of Inspection: Oct. 13, 1943
Date of Report: October 22, 1943

The property was visited on October 13, and progress since the last visit and report by Supervising Engineer Bryan R. Frisbie (on September 12, 1943) was noted as follows:

At about the time of Mr. Frisbie's visit, sinking of the winze was discontinued (at 144 feet) and drifting was started in both directions on the vein at 100 below the adit level. At the time of my visit the north drift had been advanced 125 feet from the winze. Drifting was in progress in the north end but work had been discontinued in the south drift. The drifting on this level has developed a continuous shoot of ore some 132 feet in length with average width of about 5 ft. The average of 14 channel samples which were cut in the face of the north drift after each round was:

width	oz au.	oz ag.	%pb	% zn
66"	.20	2.5	1.75	5.0

Further samples in the north end show a narrower vein width but considerably higher values (see attached sketch). The ore shoot ends at 120 feet from the shaft and the face was entering the footwall country rock at the time of my visit. This is the only point where the country rock enclosing the fissure zone is exposed in the workings below the adit level. A fault which dips steeper than the vein cuts the ore off below this level. The fault roughly parallels the vein strike except at the end of the north drift where it swings sharply westward, cutting off the ore in this direction. The fault is visible at several points in the east wall of the north drift.

Note for it cuts off vein

The ore shoot fades out in the south drift at 12 ft. from the shaft and the face of the drift is in barren material.

The winze passes into the fault at about 10 feet below the level. Work was recently resumed in the winze and at its present depth of 155 feet the hanging wall of the fault, a hard quartz, coincides with the hanging wall of the winze. This wall had been visible for the last 20 or 30 feet because of the fault material caving away from it. Sinking in the fault zone has been extremely difficult owing to the loose nature of

the ground, but the incidence of this hard hanging wall has lately helped the situation considerably. The operators plan to carry the winze through this wall and on down to a depth of somewhat over 200 feet below the adit level and to establish a level at the 200 foot point. The entry of water into the winze has been small and it has been possible to keep the winze clear by hand bailing.

The direct cost for sinking 144 feet of winze was $43.89 per foot. Drifting on the 100 ft. level was costly because of the necessity for timbering most of the drift and because of an excessive amount of material which sloughed in after each blast. The drifting costs had not been gathered entirely at the time of my visit. However, the labor cost for 62 feet of drift averaged $16.10 per foot, indicating that the work is costing about $22.00 per foot. Several days ago, the superintendent sent a note in to this office saying that the face of the north drift was entirely in the schist footwall and that he had begun to crosscut eastward through the fault from this point. He proposes to resume drifting northward in the fissure zone when the crosscut has passed thru the fault.

The boundaries of the ore shoot have been proven on each end of the 100 Ft. level and below that level. The next indicated step in the development is to explore northward beyond the fault and through the fault in the bottom of the winze. Meanwhile the sinking of the winze is in progress.

I have suggested that a raise from a point near the north end of the ore shoot on the 100 Ft. Level would be a good project at this time. The raise would start in ore and, if the old records are reliable, it should continue in ore into the workings from the No. 2 shaft at a point some 50 feet above its starting point. This might be an easy means for proving up a substantial block of ore and, if the old workings are accessible, the ore situation there might afford a valuable guide for further development from the present winze.

Production to date under the loan has been four (4) carloads of ore sent to Salt Lake. Another car was in transit at the time of my visit. Tons shipped and average settlement assays were as follows:

Tons	oz. au.	Oz. ag.	%cu	%pb	%zn
223	0.355	3.89	.36	6.28	6.08

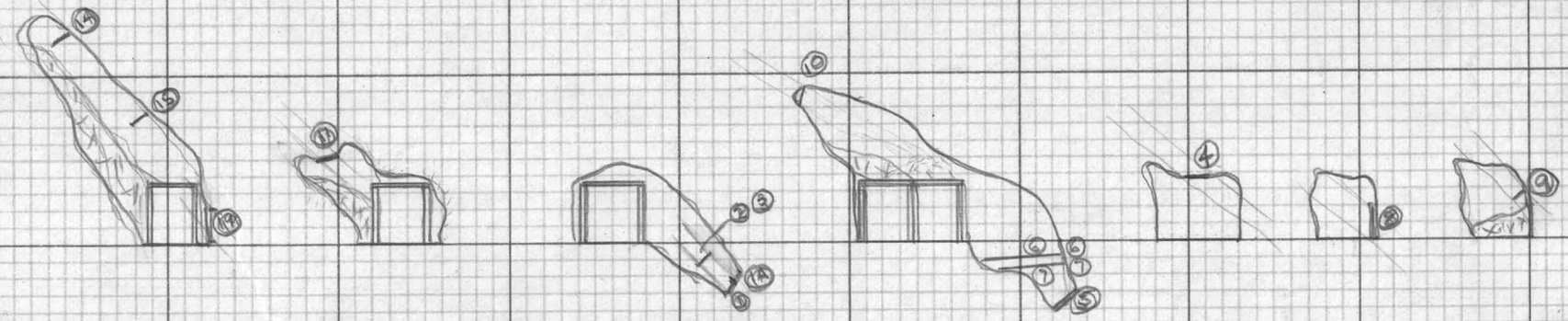
The above was in part selectively mined and in part sorted out. The pile of "mill rock" at the portal of the adit amounts to approximately 600 tons, estimated to average (from car samples) about as follows:

oz. au.	oz. ag.	%pb	% zn
.2	2.0	2.0	4.0 - 5.0

The property receives "B" premiums, zero quotas, for lead and zinc.

TRAVIS P. LANE
Supervising Engineer

90



Sec. C-C,

Sec. B-B,

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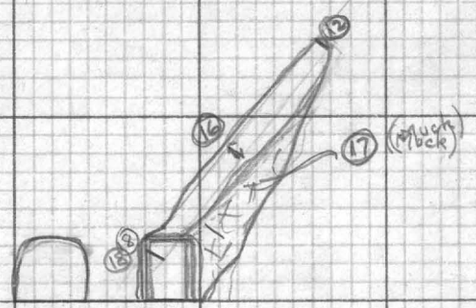
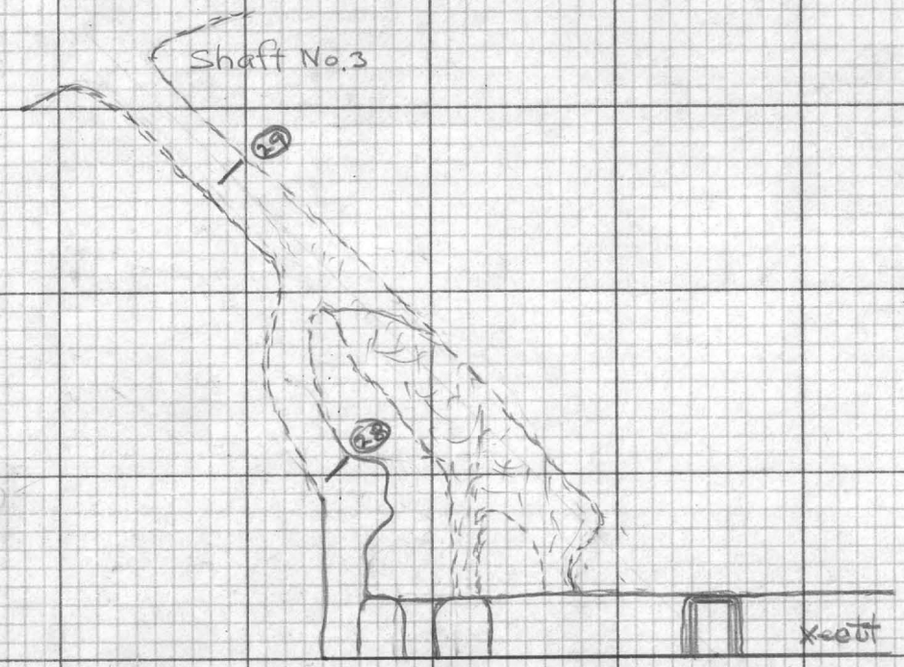
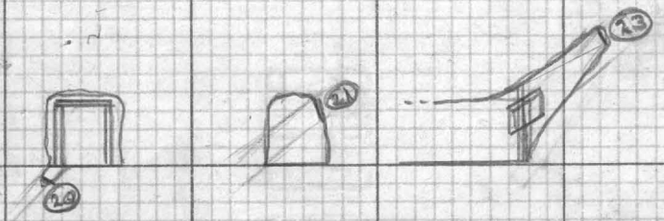


Sec. D-D, (South view)



Section E-E, (South view)



SECTIONS SHOWING SAMPLING

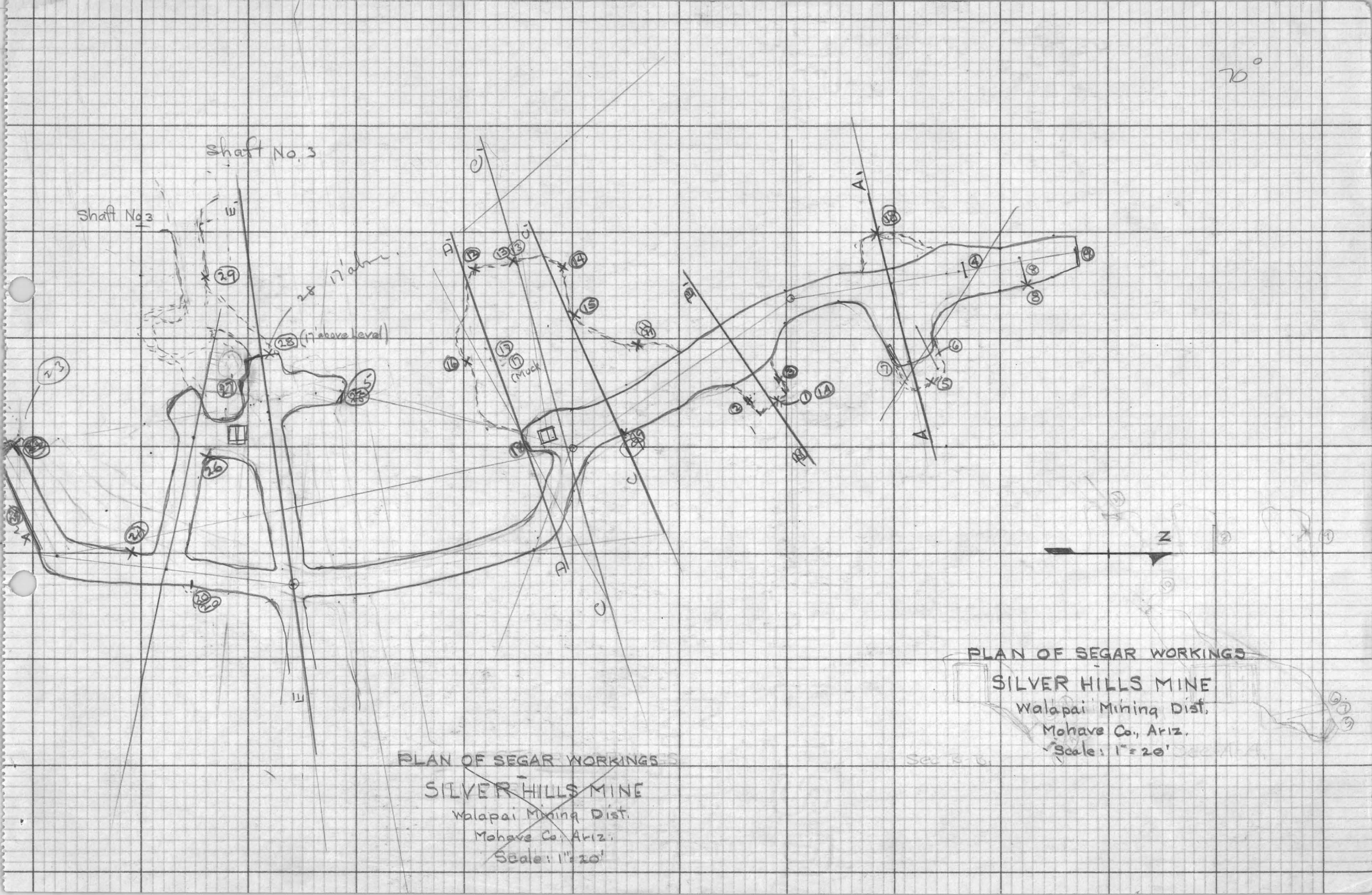
SILVER HILLS MINE

Walapai Mining Dist.

Mohave Co., Arizona

Scale: 1" = 20'

Scale: 1" = 20'


Shaft No. 3
Shaft No 3
17' above
(17' above level)
Muck
A
A'
C
C'
B
B'
N
PLAN OF SEGAR WORKINGS
SILVER HILLS MINE
Walapai Mining Dist.
Mohave Co., Ariz.
Scale: 1" = 20'
PLAN OF SEGAR WORKINGS
SILVER HILLS MINE
Walapai Mining Dist.
Mohave Co. Ariz.
Scale: 1" = 20'

REPORT ON THE

SILVER HILL MINE

CHLORIDE MINING DISTRICT

MOHAVE COUNTY, ARIZONA

Examined October 10th. to 13th. 1941

By Charles M. Heron, E.M.

REPORT ON THE

SILVER HILL MINE

CHLORIDE MINING DISTRICT

MOAVE COUNTY, ARIZONA

GENERAL:

The older workings of the Silver Hill Mine are caved and inaccessible, except the #3 shaft, which is connected with the recent work done by W.S.Segar. The extensive sampling of these older workings by R.C.Jacobson in 1936 has been checked to a certain extent more recently by WM.H.Blackburn, and seems to be fairly accurate. R.D.Leisk, who examined the property in 1934 for the United Verde Extension Mining Co.,obtained an average of .37 oz. gold, 2.1 ozs. silver and 1.56% lead, but made no mention of zinc. His samples were taken from the 100 foot level, along which Jacobson obtained an average of .17 oz. gold .

One point which has not been made perfectly clear in the data submitted is the structure of the vein, - its lack of continuity, and the difficulty in mining the ore without excessive dilution. In the 220 feet of developed length shown on the map accompanying this report the ore is found,(a) on the footwall of the 30 foot crushed zone toward the north face,(b)half way between the foot and hanging walls at the centre, and (c)on both the hanging wall and footwall, as seen at the south end of the drift.

The distribution of gold for the full length of the outcrop as shown in the shafts and test pits, is so general that one wonders why the mine has not been more fully developed. Whether the wide crushed zone exists throughout the entire length of the claims has not been brought out;however in the open pit at #2 shaft this wide crushed zone is clearly shown; also the map of the 100 foot level by Jacobson shows the drift meandering back and forth, which perhaps indicates a similar condition. The fact that the old workings are now inaccessible is probably accounted for to a great extent by the width of the crushed zone.

LOCATION AND PROPERTY:

The Silver Hill property consists of 4 patented claims, including a 500-foot square millsite, and 3 full-sized lode claims as follows:

Valley View	Silver Bell
Sonoma	Silver Bell Millsite

The claims cover a length of 4500 feet, and for the full length of the three claims the outcrop can be traced intermittently by testpits and outcroppings.

The property is on the west edge of the town of Chloride, Mohave County, Arizona.

TOPOGRAPHY:

The outcrop of the Silver Hill vein forms the crest of the hill is to a hight of about 150 feet above the valley floor which surrou t the hill has a rolling soil covered surface, with a sparse growth low vegetation. The outcrop is indicated more by oxide stain and attered quartz than by any continuous projecting rock. The hill is evidently an erosional feature of topography rather than a fault scar

Water for domestic purposes is obtained from a 40-foot well, on the Sonoma claim, from which it is pumped by a windmill.

For a mill water could probably be developed and pumped from the valley floor, within a short distance. The mine would undoubtedly encounter a considerable amount of water within a hundred feet from the tunnel level, the amount increasing with depth.

HISTORY:

The ore occurances of the Chloride district were discovered in the early sixties. The town was established in the seventies, and some mining has been carried on almost continuously since that time. While there have been two or three fairly successful operations, such as the Tennessee, the Schuykill and the Golconda, there have been many more short unsuccessful attempts to operate, and many stock promotions.

The Silver Hill vein was one of the very early discoveries of the district. Jacobson's report quotes Schrader's report as follows: "The Silver Hill mine from 1880 to 1930 produced 700,000 pounds of lead, $5,000 in gold and $10,000 in silver, a total of $50,000.00."

Wm. S. Segar acquired the mine in 1936, and during the ownership most of the work was done on the tunnel level the adit of which is on the east side of the hill. This recent work has been connected with the old #3 shaft. Within the past few months Shaft #1, which is well timbered, caved at a depth of about 40 feet.

In 1940 Mr. Segar leased the Ruth Mill, and made a test run of 300 tons of ore from the Silver Hill; the ore was partially oxidized but the results shed some light on the metallurgical problems.

GEOLOGY:

The predominant rock of the district is a pre-Cambrian granite, gneiss and amphibole schist. The earlier rocks have been intruded by a later granite, pegmatite, minette and rhyolite, which are very little altered. The dikes for the most part seem to have been intruded along the schistosity, or on the faults which follow the schistosity.

The Silver Hill vein occurs in a strong persistent fissure or fracture zone which follows the contact between the pre-Cambrian schist and a younger granite. The Silver Hill vein or fault has a strike of N 10 W and an average dip of 47 E.

The crushed rock appears to be chiefly a quartz porphyry or rhyolite, an intrusion along the contact which was thoroughly crushed by movements subsequent to the intrusion. The ore deposition appears to have taken place in open fissures within the fault zone, which at the crosscut, where it is now exposed, is over 50 feet wide horizontally and true width of about 32 feet measured at right angles to the dip of the fault, which is 47 . Because this zone is so thoroughly crushed much of the drifting is timbered and lagged tightly, and the character of the material can be seen only through narrow openings in the lagging.

Throughout the fault zone are numerous slips and faults along which is formed a heavy clayey gouge, indicating substantial movements. Many of these faults do not cut the footwall, but seem to result from subsidence in the zone.

The fact that the lenses of ore take all sorts of positions within the crushed zone, - some even lying at right angles to the walls,- seems to indicate there deposition was subsequent to the movement which crushed the intrusion.

Silicification is not general throughout the crushed zone, but the seams of quartz ore are fairly continuous, although varying greatly in width and in position in the zone. When the ore lies on the hanging wall the mining should be simple, but when it is in the center of the zone or toward the footwall it will be difficult to prevent excessive dilution.

A typical section across the vein in the sulphide zone would include two or three distinct seams of well mineralized quartz (heavily impregnated with sulphides) separated by crushed and kaolinized material.

The sulphides found, in order of abundance, pyrite, zinc blend and galena; there is chalco-pyrite in some of the ore but this less general.In the oxidized zone the quartz is honeycombed and heavily stained with iron oxide.

In certain parts of the vein the material is crushed almost to a powder,and contains disseminated pyrite; the powder has the appearance of being kaoline but is actually finely crushed quartz.

The lens of sulphide ore which is exposed from the south end of the stope to the point where sample #22 was taken, 70 feet in length, is cut off to the north by the diagonally striking fault along which samples #18,19,20,21,22,28,29 and 30 were taken. Beyond this fault to the north the ore is entirely oxidized.

There seems to be a fairly uniform relation between the lead and the silver; the gold seems to have been depositied with the quartz and the pyrite,- but occurs in no uniform ratio to either thelead or the zinc. Generally speaking, where there is not considerable amount of orequartz the ore is low in each of the four metals.

The character of the sulphides,- galena, sphalerite and pyrite,- even where they occur in massive form, is not complex but such that they could easily be separated by flotation. Whether the association of metals is such that three distinct flotation products could be made to advantage is a question to be answered by careful metallurgical tests. The assays seem to indicate that such a selective process would be justified.

DEVELOPMENT

The recent development work done by Wm. S. Segar comprises:

Crosscut adit to hanging wall	335 feet
Drifting	262 "
Crosscutting in crushed zone	105 "
Connection with old #3 shaft	40 "
	742 Feet

Because of the extent of timbering which had been necessary certain parts of this development work could not be examined or sampled, but where the vein was exposed it was sampled with a certain degree of regularity; the assays and geology were plotted on the enclosed map.

The data submitted by Mr. Segar included a report and maps by R.C. Jacobson, mining engineer of Kingman, dated August 1936; from these maps the following measurements were taken:

At the north end, on the Valley View claim:

Shaft #1	150 feet	(caved about 45 ft from collar)
Shaft #2	100 "	(caved)
Shaft #3	60 "	(open and connected with the recent work)
Drifting on 40 foot level	110feet	
Drifting on 60 foot level	25 "	
Drifting on the 100 ft "	230 "	

At the south end, on the Sonoma claim:

Adit	640 feet
Shaft #4	140 "
Shaft #5	140 "
Intermediate level	60 "
Numerous open pits	

Between the work on the Sonoma and that of the Valley View there is an offset, apparently a fault, although the work has not been continuous enough to show whether it is the same vein displaced by a fault or two parallel veins.

The collar of #1 shaft is 4 feet lower than the collar of #3 shaft. The drift is at 100 feet of depth at the #1 shaft, while the new north drift in recent work is 62 feet below the collar of #3 shaft. Taking into consideration the grade of the drifting, the north face of the new work is roughly 40 feet higher than the south face of the old level.

Judging from the dumps, most of the ore encountered in the older workings was oxidized.

In the Jacobson report, while the presence of galena and zinc blend is mentioned, their commercial importance is not stressed; in fact in the three-page list of samples, the lead and zinc content is not shown in any of the assays.

EQUIPMENT:

The equipment on the property at the mine includes:

12' X 14' blacksmith shop, with forge, anvil and hand tools
12' X 24' compressor house.
Chicago Pneumatic 210 cubic foot compressor driven by
Allis Chalmers 40 HP motor
4' X 8' air receiver
Water tank 4' X 6'
30 feet 4-inch pipe
400 " 2- " airline
460 " 1½-" "
600 " 3/4 " pipe
100 gallon pressure tank
550 feet track @ 10 pound rails
2 - 16 cubic foot mine cars
4-room house (needing some repairs) for foreman
Windmill and storage tank

Inasmuch as the mine is in the town of Chloride no provision would have to be made for living quarters for the workmen.

SAMPLING:

30 samples were taken on the Silver Hill property. This was not a complete sampling, even of the new workings, but was sufficient to correlate the results with the sampling done in the old workings by Jacobson and the late M.H.Blackburn. The samples taken in this examination of oxidized materialwere assayed for gold, silver,lead and zinc.

The following list of assays shows the total value in addition to the gold, silver, lead and zinc:

Number	Width in Feet	Oz.Gold	Ozs. Silver	%Lead	% Zinc	Total Value
1	4½	.08	.45	1.04	2.17	$7.46
2	5½	.04	.21	.21	1.61	4.12
3	2	.01	.05			.39
4	4	.10	.80	1.46	3.84	11.29
5	4	.03	.22	.63	2.53	5.60
6	4	.04	.21			1.55
7	4	.05	.55	1.25	6.36	12.84
8	3½	1.10	7.30	12.00	5.66	66.00
9	6	.55	.65			19.71
10	3½	.17	118	.21	1.67	8.73
11	3½	.08	.32	.63	1.62	6.10
12	2	.06	.19	.31	.50	3.31
13	2½	.03	.27			1.24
14	3	.07	.33			2.68
15	2½	.02	.05			.74
16	3½	.02	.03			.72
17	3	.14	2.46	4.18	3.94	17.13
18	4½	.23	3.15	7.52	6.06	27.65
19	4	.39	1.31	5.74	3.28	25.88
20	1½	.32	5.38	9.40	8.33	37.71

Number	Width in Feet	Oz. Gold	Ozs. Silver	% Lead	% Zinc	Total Value
1	[illegible]	.07	.73	1.04	2.12	$7.23
2	[illegible]	1.08	1.68	2.40	13.52	61.33
3	5½	.25	.50			9
4	2	.06	1.84			[illegible]
5	2	.58	[illegible]			22.[illegible]4
6	1½	.13	[illegible]			4.74
27	[illegible]	.10	[illegible]	.31	.76	5.09
28	4	.39	[illegible]1	2.30	3.33	21.94
29	3	.26	[illegible]4	4.59	4.95	22.90
30	3	.18	[illegible]2	3.86	3.38	16.25
31	3½	.16	[illegible]9			6.16

Gold at $35 per oz.
Silver at 71 cts per oz.
Lead at 5.[illegible] cts per pound
Zinc at 7.[illegible] cts per pound

MAPS:

Included in the report are two maps:

Plan and section, with geology and assays of the new work, (based on Brunton survey by Heron)

Photostat of Jacobs' map to which had been added assays of samples by Blackburn.

ORE RESERVES:

There is some basis for assuming a definite tonnage per foot of depth along a given length of drift which has been adequately sampled; considering the lack of systematic sampling, or of development work itself, beyond the 100 foot level of the #2 shaft, it would seem that an assumption of a specific tonnage is not warranted.

On the north drift of the new work the 70 foot lens of sulphide ore averages 3.4 feet in width, with an average assay of $25.13, and represents 20 tons per foot of depth.

Beyond the sulphide lens for 40 feet to the north face of the workings the ore is oxidized, and the values include no lead and zinc. The average assay for the 40 feet for 2.5 feet of width is $9.56. If this 40 feet still contained the sulphides which have been oxidized, the entire 110 feet would very rpobably constitute a lens of commercial ore. In other words, when the work reaches the permanent sulphide zone, as it should do within 100 feet, the continuity of the ore should be considerably greater than it is in the oxide zone.

METALLURGY:

As mentioned above, a mill test was made for MR. Segar in 1940, on 300 tons of the Silver Hill ore. The Ruth Reduction mill was leased, and the test was conducted by Wm.A.Crowfoot. The test was made on a mixed oxidized and sulphide ore, which averaged $12.08 per ton in gold and silver. An extraction of 88% of the gold and 84% of the silver was obtained under difficult and unfavorable conditions.

heads assayed	$12.08	(.296 oz. gold, 2.24 ozs. silver)
tails "	1.54	
concentrates	40.17	plus 12.60% Pb; 5.30% Zn

(gold at $35 and silver at 71 cts per oz.)

MINING METHODS AND COSTS:

Judging from what can be seen, the ore may be found anywhere in a 30 foot crushed zone. When the ore lies on the hanging wall the dilution in mining will be [illegible] and less timbering will be required. From any other part of the zone it will be necessary to mine the ore selectively - by some sort of cut and fill system of mining, with the fill kept well up toward the back of the stope. The mining costs will be high, but if frequent bodies of ore are encountered, - 70 to 100 foot lengths of continuous ore - , as seems possible from what can be seen, the cost should not be prohibitive.

If the development program outlined below should prove productive there should be sufficient stoping ground to furnish between 75 and 100 tons per day.

On this basis the operating costs would probably be about as follows:

Mining costs (including development)	$5.50 per ton
Milling costs	1.50
	$7.00 " "

This figure does not include taxes, insurance, overhead or metallurgical loss; nor does it take into account the scarcity of labor or any rise in wages.

PROPOSED DEVELOPMENT:

For the most immediate results a 100 foot inclined shaft should be sunk from the Segar tunnel level on the crushed zone, following the hanging wall. At a 100 foot depth a station and pocket should be cut, and drift run both north and south with crosscuts at 50 foot intervals.

There is no reason to believe that the structural characteristics of the vein should change within a few hundred feet of depth, except that it is to be hoped that the sulphide content will be fairly uniform and widely distributed, as the gold seems to be in the oxidized zone.

CONCLUSIONS:

From the sampling done in connection with this examination there seems to be every reason to assume that the average of the Jacobson and Blackburn sampling is reasonably correct for the part of the mine that is now accessible.

Granting this assumption, there appears to be a length indicated by the Segar north drift and the olf 100 foot level of at least 200 feet of ore of minable width (at least 3 feet wide) which averages .30 oz. gold and 1.75 ozs. silver in the Segar drift and .19 oz. gold and 3.22 ozs. silver in the old 100 foot level; or an average of .20 oz. gold and 2.49 ozs. silver, or about $9.27 in gold and silver.

[illegible]ing f om the 70 feet of sulphide ore in the Segar drift, [illegible] lead content where the zone is unoxidized will be 4.62% [illegible]ad and 6.01% zinc, or $13.98 per ton (lead at 5.7 cts and zinc at [illegible]5 cts per pound).

In other words the zinc and lead content , which has been [illegible]riously considered in previous examinations, is of considerably more [illegible]lue than the gold and silver.

Within a hundred [illegible] water level should be reached and the zone of oxidation bottomed. [illegible] no apparent reason why the ore occurance should not extend [illegible] the sulphide zone.

RECOMMENDATION:

The program suggested above seems warranted by the probabiltiy of developing a substantial body of ore, and it is therefore recommended that this development work be done.

Respectfully submitted,

(signed) Charles M. Heron

Examined October 10 to 13, 1[illegible].

ASSAY RECORD — MINE RUN SAMPLES FROM DEVELOPMENT WORK — SILVER HILL MINE

Samples taken from ore used in mill-run test made in June 1940; ore taken from the new Segar north drift level; work done since that time in driving drifts and upraise to complete #3 shaft connection show higher values.

Date 1940	Number	Description	Gold	Silver	Lead	Zinc
4-22	57	1st 10 cars -south drift	.52	1.38		
4-24	60	24 cars -face south drift,upraise	.38	1.86		
5-1	63	18 cars - face " " "	.19	1.81		
5-3	65	24 cars " " " "	.27	1.81		
5-4	65	(recheck by Jacobson)	.58	2.98		
5-4	66	" of 57, 60, 63	.145	2.38		
5-6	68	9 cars north drift CC	.14	2.36	3.8%	
5-6	69	14 " south " & upraise	.66	4.94	2.7	
5-6	69	Recheck by Jacobson	.49	7.43	4.7	
5-8	71	10 cars north drift CC	.18	1.22	3.6	
5-13	--	Check by Nelson " "	.24	1.76		
5-8	71	Recheck	.645	2.22	3.2	

Note: From #63 to 71 totalling 75 mine cars, our first carload of ore to AS&RCo,El Paso, averaged .315 Au, 2.5 Ag; shipped May 10; AS&RCo averaged .325 Au & 2.6 Ag.

5-10	72	6 cars south drift	.375	6.87	3.6%	
5-13	73	14 cars " & N " s	.335	3.37		
5-16	76	10 cars 1st round N drift	.40	3.60	6.7	
5-21	77	11 cars south & 30 cars N CC	.295	2.03	2.4	3.2

Note: From #72 to 7% , 78 cars - our second carload shipment to AS&RCo at Hayden, Ariz., averaged .315 Au & 2.9 Ag; shipped May 24th; AS&RCo paid for .275 Au & 1.7 Ag

5-25	78	14 cars north drift	.30	1.50		
5-26	80	11 " " "	.37	1.87		
5-27	81	11 " " "	.262	2.14		
5-29	83	41 " " "	.345	3.33	5.2	
6-3	84	60 " " "	.365	2.66		
6-5	86	36 " " "	.38	2.34		
6-8	88	60 " " "	.295	2.71		
6-10	89	54 " " "	.365	2.26		

Note: Assay averages remain close to an average of .33 Au, 2.5 Ag, and 2.5% to 3% lead, the same average obtained from the sampling done in the 200 feet of the 100 foot level drift north from #1 shaft .

.1 oz Gold = $40 .1 Ag = .90
.5 " " = 200 1.0 " = 9.00
1.0 " " = 400

REPRESENTATIVE SAMPLES TAKEN SINCE JANUARY 1941 :

Number	Description	Ounces Gold	Silver	Lead	Zinc
A25	Ist contact new ore -south drift	.19	16.53		
B9	6' upper outside edge,new ore 22' above drift level	.355	1.41		
B10	7' Breast, across vein, drift	.485	2.34		
B11	From fault next to ore, "	.215	1.59		
B13	4' lower half, face in drift, under ore body	.24	6.40		
B14	4' upper half, ditto above	.21	2.00		
B15	Grab sample, from breast of drift around B13,B14,A25	.40	4.60		
B16	Breast sample 7' wide	.70	6.10		
B17	32 cars - after blasting breast shown in B16	.44	2.84		
B18	4' upper part of stope	.23	1.40		
B19	5' lower " " "	.64	6.20		
B20	18 cars - all taken on break of B18, B19 - broke thru to main tunnel, taking much fault mat.	.39	4.60		
#14	In north drift, driving to connect with #1 shaft	.23	4.80	9.02%	4.46%
15	ditto	.91	3.60	6.16	10.60
16	"	.04	.20		
17	"	.23	.90		
18	"	.58	3.40	4.12	8.03
19	"	.32	5.40	4.95	
20	"	.61	.70		
21	"	.56	6.50	3.47	11.60
23	"	.97	1.90		
24	"	.47	1.80		
25	" - 4' oxides ,top of drift	.67	1.60		
26	" - 4' " next to top	.56	1.60		

- -

CARLOAD SHIPMENTS TO AS&RCO:

3-19-42	41.96 tons	.78 Au, 3.7 Ag, 5.25% Pb	Value-$30.39	per ton
5-21-42	22.98 "	.915 Au,5.15 Ag, 9.45% Pb	" 39.45	"
7-21-42	40.84 "	.565 Au,3.4 Ag, 6.4% Pb	" 24.24	"
9-21-42	27.32 "	.572 Au,4.9 Ag, 8.05% Pb	" 26.98	"
11-23-42	42.67 "	.52 Au, 4.25 Ag, 6.9% Pb	" 23.82	"

Note: until recently it was necessary to cob out the zinc because the Smelter fined us for anything in excess of 5%; now we have a contract with USS&RCo to pay for the zinc as well, and are just sending them a carload od ore containing zinc as well as the gold,silverand lead.

SILVER HILL MINE

Assume sulphide ore to be , without dilution,
.30 oz. gold, 1.75 ozs. silver, 4.6% lead and 6% zinc.

100 tons of crude ore will have:-

30 ozs. gold	175 ozs. silver	9,200 lbs Pb.	12,000 lbs Zn.
at $35	70 cts	6½ cts	8¼ cts.
$990.00	$122.50	$598.00	$990.00

Gross value contents : $2,700.50

Assume 20 tons pyrite conc., 8 tons Pb. conc, 10 tons Zn. conc., and 62 tons tailings:

	ASSUME	AMOUNT IN PRODUCT	PER TON PRODUCT	KINGMAN VALUE PRODUCT PER TON F.O.B.	VALUE PRODUCT 100 TONS CRUDE
Pyrite	80% of Au	24 ozs.	1.2	$35	$700
20 tons	50% of Ag	87.5 ozs	4.4		
	5% of Pb	460 lbs	1.1		
	5% of Zn	600 lbs	1.5		
Galena	80% of Pb	7360 lbs	46%	$52	$416
8 tons	20% of Ag	35 ozs.	4.375 ozs.		
	5% of Zn	600 lbs	3.75%		
	6% of Au	1.8 ozs	0.225 ozs.		
Blend	80% of Zn	9600 lbs	43%		
10 tons	5% of Pb	460 lbs	2.3%	$34	$340
	15% pf Ag	26.25 ozs	2.625 ozs		
	6% of Au	1.8 ozs	0.018 ozs.		
Tailings	8% of Au	2.4 ozs	0.039 oz		
62 tons	15% of Ag	26.25 ozs	0.42 ozs		Nil
	10% of Pb	920 lbs	0.07%		
	10% of Zn	1200 lbs	0.10%		
					$1,456.00

$14.56 net smelter returns per ton crude on 100 tons F.O.B. cars Kingman

Mining (and development)	$5.50
Milling	1.50
Ins. etc	.40
Gen'l	1.00
	$8.40 before taxes

Second Loan Application - 9/10/43
Silver Hill Mine - $30,000.—
Balance of data on printed forms - Submitted

Sept.10,1943.

Reconstruction Finance Corp;
Washington,D.C.

Re: Wm.S.Segar;Docket 4276

Gentlemen;

During early July,1943 a $20,000 development loan was granted to Wm.S.Segar on the Silver Hill mine in Chloride, Arizona.Liberty Mines,as operator,started work about the middle of July,1943 upon above property and have,as of Sept.1, 1943 made the following expenditures thereon:

Rehabilitation of Mine;Equipment,Water Supply; Bldgs and Powder Magazine; ----------	$7534.31
Underground Work;	
20 feet of Raise for winze headworks; ----	700.00
107 feet of Winze sinking;----------	6200.00
Total expenditures to Sept.1 ------	$ 14434.31
Balance in Trust Fund Sept.1;------	$ 5565.69

At the present rate of expenditures this balance will last until about Sept.25,1943.

Owing to the excellent showing of ore,disclosed by the work to date,we feel that further expenditures are more than justified and are therefore making application for an additional $30,000 loan to continue the development of this promising ore body.

After the rehabilitation of the mine,a winze was started near the north end of the Segar Adit level.This winze, 7 x 9 ft in clear of timbers (8 x 10 ft;rock section) was sunk during August,to a point 110 feet below the floor of the Segar Adit,with an average dip of 47 degrees.This work produced about 587 tons of ore and 97 tons of waste.At a depth of 50 feet below the collar of the winze the hangingwall of the ore flattened and passed into the back of the winze?Had this ore been taken out during the course of the sinking,judging from the drill holes samples,it would have yielded some 180 tons of ore (4.4'x 10'x 45'),assaying 0.34 Au; 3.5 Ag;4.2% Pb and 4.4% Zn.Out of the 587 tons of ore actually taken out of the winze,some 155 tons were shipped to Midvale,Utah;judging from our sampling this ore had an average assay of 0.33 Au; 4.4 Ag; 3.3% Pb; 6.1% Zn.The remaining 432 tons of ore was stock piled and judging from many samples,both grab and channel,had an average content of 0.25 Au; 2.0 Ag; 2.4% Pb; 4.8% Zn. Thus the weighed average of the ore removed from the winze, together with that that dipped out of the opening,was 0.28 Au; 2.8 Ag; 3.0%Pb; 4.9% Zn.This grade of ore with a zero quota and A-B-C premiums on lead and zinc would have a gross assay value as follows;

Gold; 0.28 @ $35.00 ----------	$ 9.80
Silver;2.8 @ 0.71 ----------	1.99
Lead;3.0%; 60 lbs @ 0.12-------	7.20
Zinc;4.9%; 98 lbs @ 0.165------	16.17
	$ 35.16

Under our contract with the U.S.Smelt.Refin;& Mng.Co; a copy of which is enclosed,we would realize with premiums on the above ore; ----------$21.23

Less Treatment ---------	3.25	
" Haul to Kingman ---	1.50	
" Frt to Midvale ---	5.00	9.75
Mill net,after all charges;--		$ 11.48

With a local mill getting only the recoveries as paid for at Midvale and with a milling cost of $2.00 per ton, the mill net on the above ore would be $19.23.With a mining and development cost of $10.00 per ton the profit would be about $9.00 per ton of ore.

The widths of ore exposed in the winze ranged from of 12 feet to a minimum of 4 feet, with an average of about 7.5 ft. This ore is exposed along the Segar Adit level for a distance of 110 feet, 60 feet to the south and 50 feet north of the winze to the face of the drift. Judging from the assay maps of R.C. Jacobson and R.D. Leisk of the old 100 ft level from No.1 shaft (Now inaccessible), this ore shoot could persist for another 200 feet north of the face of the Segar Adit level. The ore shoot thus has a possible or indicated length of some 300 feet. Should it be found to have a length of 200 feet and with an average width of 7.5 ft; it would produce about 125 tons per foot of depth. Should the porposed development program, here in outlined, prove successful, it would on the above basis, put in sight about 28,000 tons of ore.

In many respects, geolgically the neighboring Tennessee-Schuylkill and the Silver Hill properties are comparable. They are parallel fissures about one mile apart. Both are heavily crushed zones in pre-Cambrain crystalline rocks. The Tennessee fissure is traceable for nearly two miles, the Silver Hill is exposed along the outcrop for some 4000 feet. The vein filling of both are identical, comprised of a strong gouge on both walls between which occur pyrite, galena, sphalerite and small amounts of chalcopyrite in a gangue of quartz and soft altered fragments of wall rocks. Minable ore bodies in the Tennessee range from 2 to 14 feet in width. Along the strike four ore shoots, attaining stope lengths up to 500 feet, have been mined to a maximum depth of 1600 feet. The longitudinal limits of the ore down the pitch can be predicated fairly accurately, with slight if any changes in grade of ore between succeeding levels.

In 1938 the Tennessee mined and milled some 54,000 tons of ore having an average metal content of about; 0.20 Au; 2.1 Ag; 3.6% Pb; 5.7% Zn. Making a lead-iron concentrate and a zinc concentrate, the flotation plant recovered about 95 % of the gold; 94 % of the Silver; 94 % of the lead and 72 % of the zinc (in the zinc concentrate).

Exhibit A

10. Proposed Work;

By the time (Sept.25th) that the present funds are exhausted it is estimated that about 80 feet of drifting will have been accomplished on the first level below the Segar Adit. As it is proposed to do about 250 feet of lateral work on this new level, altogether, there would thus be left about 170 feet. Cost of drifting and cross cutting is estimated at $18.00 per foot; thus

170 feet of lateral work at $18.00 ---------- $3060.00 - 200 Ft. Lev.

Should this work prove satisfactory it would then be necessary to raise to the Segar Adit level, estimated as;

130 feet of raise @ $35.00 per ft.---------- 4550.00

Then raise from the top of the present winze through to the surface, to serve as working shaft, estimated as;

60 feet of raise @ $35.00 per ft;----------2100.00

Equip at the surface of the new shaft, as follows;

Headframe & Bins;----------	1300.00
Hoist & Compressor Bldg; ----------	750.00
Moving & erection of hoist; ----------	200.00
Moving & erection of compressor, from the Alvarado mine; ----------	550.00
Extension of Power Line;----------	100.00
Water Supply to new site;----------	200.00

Then sink the present winze from 130 ft below the Segar Adit to a point 250 feet below the adit level, this would allow a sump 20 feet deep.

120 feet of Shaft @ $60.00 per ft;----------7200.00

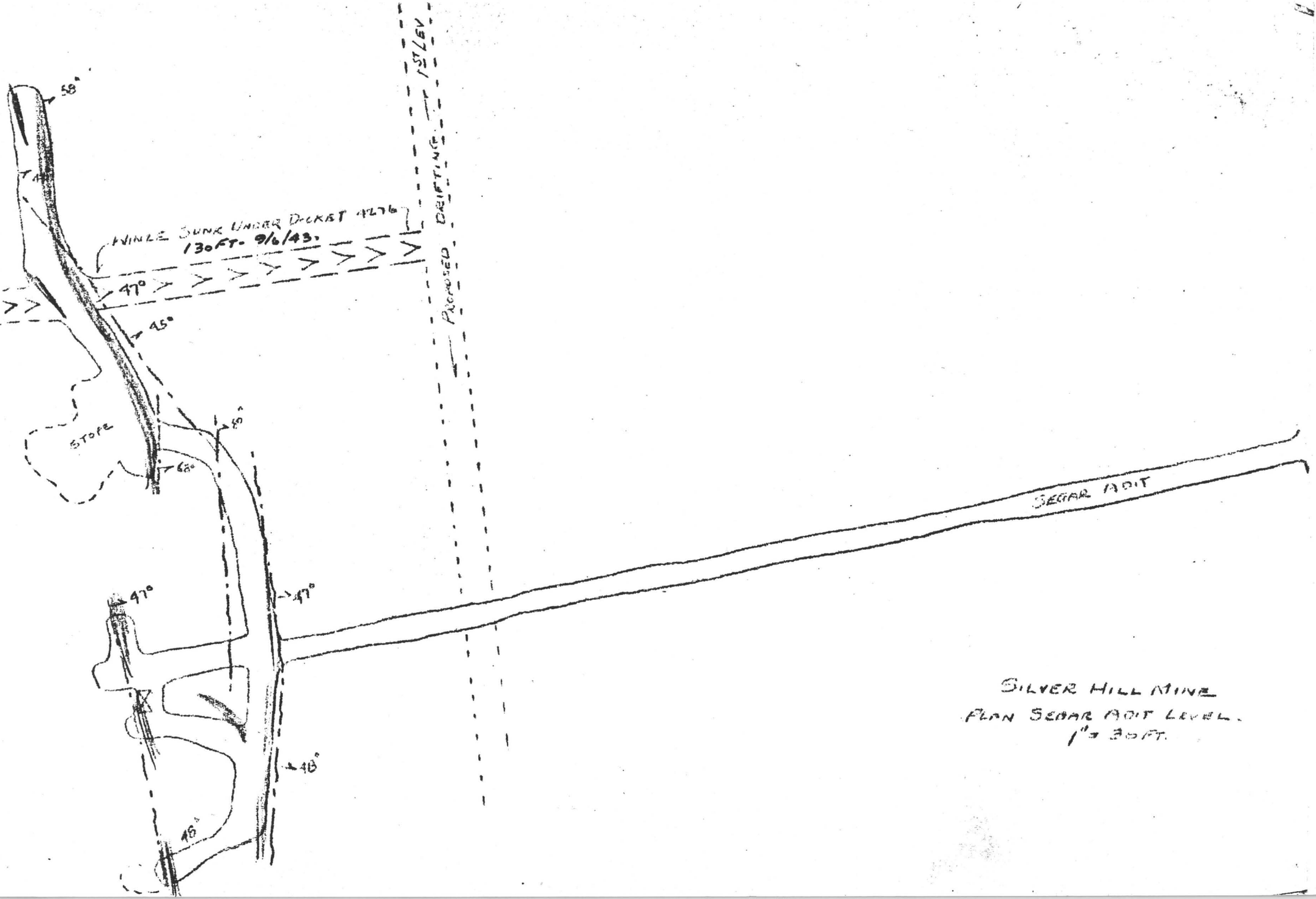
Then from a point 230 feet below the adit level, open another level (this would be the 300 Ft level measured from the outcrop) by some 250 feet of drifting and cross cutting;

250 feet of lateral work @ $18.00 ---------- 4500.00 - 300 Ft. Lev.

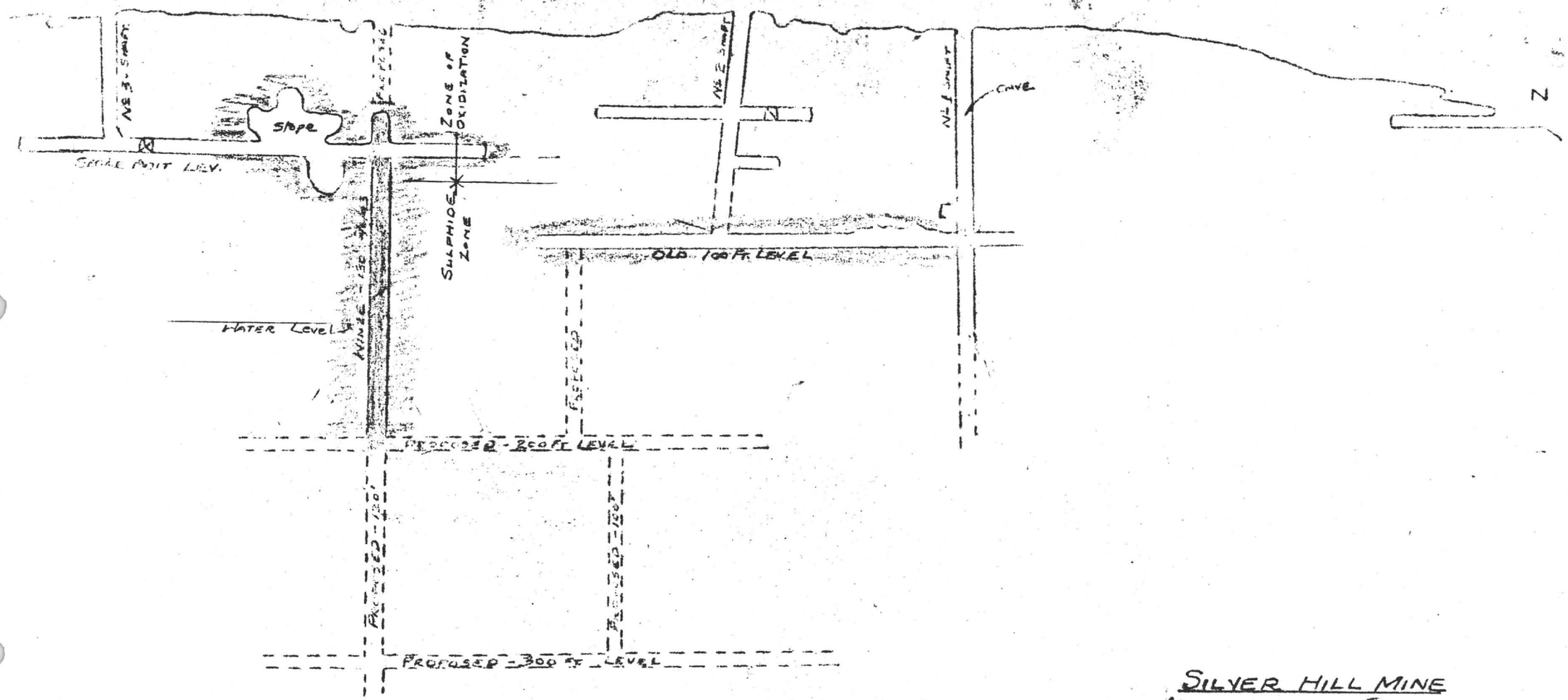
Then 100 feet of raise, 300 to 200 level;--------- 3500.00

Contingencies; ---------- 1990.00

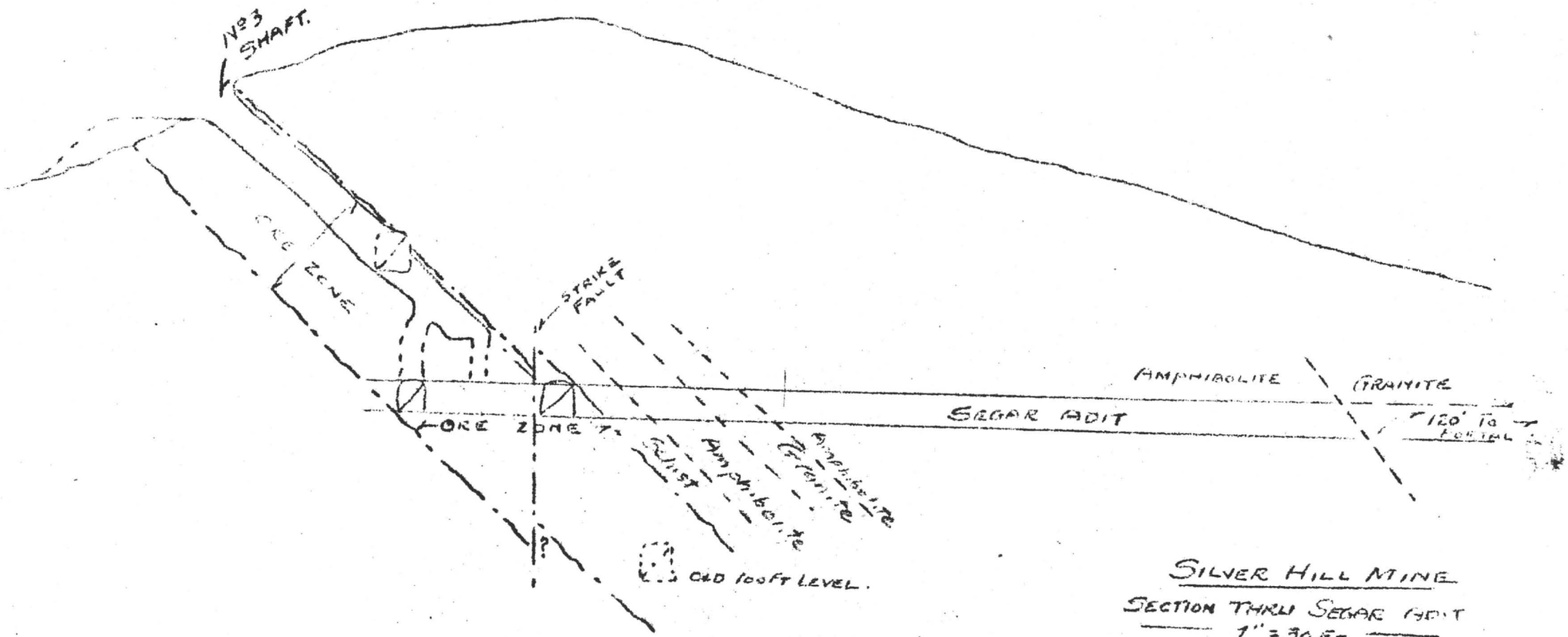
$ 30,000.00



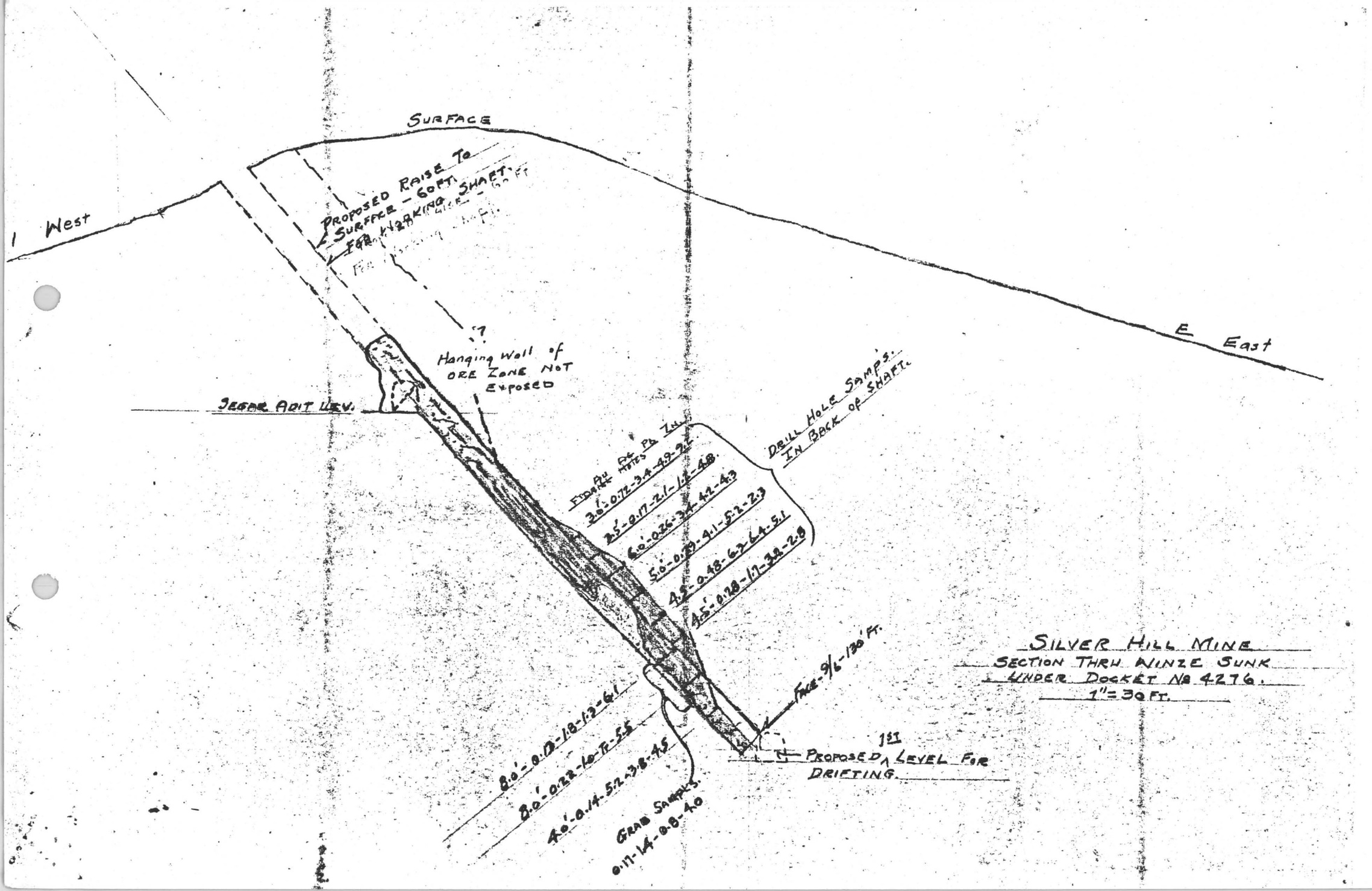
SILVER HILL MINE
PLAN SEGAR ADIT LEVEL.
1" = 30 FT.



SILVER HILL MINE
LONGITUDINAL SECTION
— 1" = 60 FT. —



SILVER HILL MINE
SECTION THRU SEGAR ADIT
1" = 30 FT.


SURFACE
West
E East
PROPOSED RAISE TO SURFACE - 60 FT.
FOR HOISTING SHAFT.
Hanging Wall of ORE ZONE NOT EXPOSED
JEGGER ADIT LEV.
DRILL HOLE SAMPS. IN BACK OF SHAFT.
3.0'-0.72-3.4-4.9-2.7
2.5'-0.17-2.1-1.3-4.8
6.0'-0.26-3.4-4.2-4.3
5.0'-0.29-4.1-5.2-2.3
4.5'-0.48-6.2-6.4-5.1
4.5'-0.28-1.7-3.2-2.8
FACE-9/6-120 FT.
8.0'-0.10-1.8-1.2-6.1
8.0'-0.22-1.0-1.7-5.5
4.0'-0.14-5.2-3.8-4.5
GRAB SAMPLES.
0.11-1.4-0.8-4.0
PROPOSED 1ST LEVEL FOR DRIFTING.
SILVER HILL MINE
SECTION THRU WINZE SUNK
UNDER DOCKET No 4276.
1" = 30 FT.

Comco West

H.E. PATTERSON
1709 E. OREGON
PHOENIX, ARIZ. 85016

James M. Hutchinson
666 Rudd Road
Vista, Ca. 92083
(714) 726-7227

MARCH 19, 1981

DEAR MR. PATTERSON: DAVIS 724-1140

This is in answer to your request for information regarding the mining property advertised for sale. The Silver Hill Mine is owned by Mrs. Eleanor Davis of Vista, Ca. and she has asked me to assist her in selling it. I am not a real estate agent, just a friend of hers.

The Silver Hill Mine is located on the west edge of the town of Chloride, Mohave County, Arizona and consists of three full sized patented lode claims: THE VALLEY VIEW(20 acres), THE SONOMA(20 acres), THE SILVER BELL(20 acres), and THE SILVER BELL MILLSITE (5 acres) for a total of 65 acres. The claims cover a length of 4,500 feet following an outcroping which runs the length of Silver Hill. The mine has a long and interesting history dating back to 1863. The patent papers were signed by William Mckinley, then president of the United States. It has changed hands several times since then but was never mined to any extent by an organized mining company and has not been touched since 1946.

According to records which Mrs. Davis has kept, only one shaft went as deep as 200 feet and there are many old assays taken from all levels. Of 130 assays I compiled from the old documents averages per ton are 0.34 ozs. Gold, 2.87 ozs. Silver, 4.12% Lead and 4.91% Zinc. Some of the old reports compare the vein of the Silver Hill with the Tennessee vein which was the most sccessful in the area. The two veins lie parallel about ½ mile apart and are very similar in geology and structure. The Tennessee was in rich ore at the 2,000 ft. level. The Silver Hill has never been drilled to any depth but generally the ore carries higher precious metal content and the same lead and zinc content as the Tennessee ore.

If this property sounds of interest to you I would be glad to furnish further detailed information. You may also examine the property any time, at your own risk, of course. The price is negotiable but in the vicinity of ~~175,000~~ $95,000 dollars, plus she would like to retain a small percentage royalty. Terms can possibly be worked out but only over a short term of five years or less.

There are probably millions of dollars in gold and silver to be taken from the Silver Hill if someone has access to the knowledge and equipment to mine it. If you have any further questions please call or write.

Sincerely,

Jim Hutchinson

Jim Hutchinson

P.S. ALSO INCLUDED IS ONE 20 ACRE UNPATENTED CLAIM, "THE LAST CHANCE", LOCATED ADJACENT TO "THE VALLEY VIEW", WHICH MAKES A TOTAL OF 85 ACRES.

SILVER HILLS MINE

The mine is located on a low hill near the western edge of Chloride in Secs. 4, 9 and 10, T. 23 N., R. 18 W. The property consists of 4 patented claims and 1 millsite.

The country rock consists of pre-Cambrian granite, schist and gneiss intruded by pegmatites, rhyolites and younger granites. The Silver Hills vein occurs as a broad crushed fracture zone; 20-40 feet wide, along a contact between granite and amphibolite schist. The filling of the crushed zone is generally a silicified rhyolite porphyry. Repeated and intense movement along the zone has resulted in a grainy crushed mass with numerous faults and gouge seams. The dip of the vein is 47 degrees easterly.

Ore occurs in the thin lenses scattered in a random manner throughout the zone. Although the lenses conform with the dip and strike of the contact, here and there lenses are found lying at varying dips and strikes across the zone.

The ore minerals are gold, silver, lead and zinc with minor amounts of copper. Ore at the surface and in the upper part of the mine is oxidized. The Silver Hill workings appear to have been developed near the lower limit of the transition zone between oxidized and sulfide mineralization. Sphalerite is common in the upper part of the workings and galena and pyrite begin to appear at about the level of the crosscut and main drifts.

The mine is developed by five shafts ranging in depth from 100 feet to 220 feet with a distance of 360 feet between Nos. 1 and 3 shafts. Extending from these shafts are about 450 feet of drifting and some crosscutting on the 50 and the 100 foot horizons. The south end of the property, which is developed by two shafts sunk to the 100 level, is caved and inaccessible. Mr. Segar's production prior to 1943 includes about 300 tons derived chiefly from stoping near the foot of the old No. 3 shaft. The 300 tons were run through a mill and averaged .296 oz au, 2.24 oz ag and probably 5% Pb and 2% zn.

By October 13, 1943 the winze had been sunk 144 feet and drifting advanced 125 feet north. Drifting on this level has developed a continuous shoot of ore 132 feet in length and about 5 feet in thickness. The ore shoot fades out in the south drift at 12 feet from the shaft.

The attached table shows the production from the property under RFC.

RECONSTRUCTION FINANCE CORPORATION
MINING DIVISION
SUPERVISING ENGINEER'S PROGRESS REPORT

Docket No. B-ND-4276
William S. Seegar
Date of Inspection: Oct. 13, 1943
Date of Report: October 22, 1943

The property was visited on October 13, and progress since the last visit and report by Supervising Engineer Bryan R. Frisbie (on September 12, 1943) was noted as follows:

At about the time of Mr. Frisbie's visit, sinking of the winze was discontinued (at 144 feet) and drifting was started in both directions on the vein at 100 below the adit level. At the time of my visit the north drift had been advanced 125 feet from the winze. Drifting was in progress in the north end but work had been discontinued in the south drift. The drifting on this level has developed a continuous shoot of ore some 132 feet in length with average width of about 5 ft. The average of 14 channel samples which were cut in the face of the north drift after each round was:

width	oz au.	oz ag.	%pb	% zn
66"	.20	2.5	1.75	5.0

Further samples in the north end show a narrower vein width but considerably higher values (see attached sketch). The ore shoot ends at 120 feet from the shaft and the face was entering the footwall country rock at the time of my visit. This is the only point where the country rock enclosing the fissure zone is exposed in the workings below the adit level. A fault which dips steeper than the vein cuts the ore off below this level. The fault roughly parallels the vein strike except at the end of the north drift where it swings sharply westward, cutting off the ore in this direction. The fault is visible at several points in the east wall of the north drift.

The ore shoot fades out in the south drift at 12 ft. from the shaft and the face of the drift is in barren material.

The winze passes into the fault at about 10 feet below the level. Work was recently resumed in the winze and at its present depth of 155 feet the hanging wall of the fault, a hard quartz, coincides with the hanging wall of the winze. This wall had been visible for the last 20 or 30 feet because of the fault material caving away from it. Sinking in the fault zone has been extremely difficult owing to the loose nature of

the ground, but the incidence of this hard hanging wall has lately helped the situation considerably. The operators plan to carry the winze through this wall and on down to a depth of somewhat over 200 feet below the adit level and to establish a level at the 200 foot point. The entry of water into the winze has been small and it has been possible to keep the winze clear by hand bailing.

The direct cost for sinking 144 feet of winze was $43.89 per foot. Drifting on the 100 ft. level was costly because of the necessity for timbering most of the drift and because of an excessive amount of material which sloughed in after each blast. The drifting costs had not been gathered entirely at the time of my visit. However, the labor cost for 62 feet of drift averaged $16.10 per foot, indicating that the work is costing about $22.00 per foot. Several days ago, the superintendent sent a note in to this office saying that the face of the north drift was entirely in the schist footwall and that he had begun to crosscut eastward through the fault from this point. He proposes to resume drifting northward in the fissure zone when the crosscut has passed thru the fault.

The boundaries of the ore shoot have been proven on each end of the 100 Ft. level and below that level. The next indicated step in the development is to explore northward beyond the fault and through the fault in the bottom of the winze. Meanwhile the sinking of the winze is in progress.

I have suggested that a raise from a point near the north end of the ore shoot on the 100 Ft. Level would be a good project at this time. The raise would start in ore and, if the old records are reliable, it should continue in ore into the workings from the No. 2 shaft at a point some 50 feet above its starting point. This might be an easy means for proving up a substantial block of ore and, if the old workings are accessible, the ore situation there might afford a valuable guide for further development from the present winze.

Production to date under the loan has been four (4) carloads of ore sent to Salt Lake. Another car was in transit at the time of my visit. Tons shipped and average settlement assays were as follows:

Tons	oz. au.	Oz. ag.	%cu	%pb	%zn
223	0.355	3.89	.36	6.28	6.08

The above was in part selectively mined and in part sorted out. The pile of "mill rock" at the portal of the adit amounts to approximately 600 tons, estimated to average (from car samples) about as follows:

oz. au.	oz. ag.	%pb	% zn
.2	2.0	2.0	4.0 - 5.0

The property receives "B" premiums, zero quotas, for lead and zinc.

TRAVIS P. LANE
Supervising Engineer

Correspondence

Mayer, Ariz?
April 8, 1943.

Dear Mr. Davis;

Joe and I have just returned from Silver Hill. We found no nigger in the wood pile and still think it an unusually good prospect, but a mill is not in the picture at this stage. The Tennesse Supt told me they were planning on increasing their mill capacity and treating custom ores.

au
ag
PB 16.47
ZN 13.64

S.M. Hedges had received the assay results of his last shipment of 49.6 tons, all of which came from the winze he was working when we first visited the mine last month. This 49.6 tons assayed as follows; 0.525 Au: 4.4 Ag: 8.9% Lead; 6.2% Zinc. Hedges says that he formely shipped about nine tons of ore from this same winze so it has produced about 59 tons of ore all together. This checks reasonably well with the present volume of the hole, allowing for some 5 tons of waste sorted out of the ore. The average width of this shipping ore was about 2.0 ft and of course represents the best portion of the ore exposed along the drift. This winze is now 17 feet deep, the bottom shows 1.5 to 2.0 ft of ore, of comparable grade to that shipped, along a length of about 12 ft. The lense of ore upon which this winze was sunk has an exposed length along the Segar drift of about 70 feet, with an average width of 3.4 ft and an average value of 0.30 Au: 2.0 Ag: 4.5 % Lead and 6.0% Zinc. This lens then, should it prove presistant down the dip, would produce about 20 tons of ore per foot of depth. This is really all the ore that there is in sight in the mine, with the exception of a few small scattered bunches in the oxidized zone.

51.61

Au - 10.50
Ag - 1.42
PB - 8.31
ZN - 13.20

Au 7.78
Ag 1.05
PB 1.62
ZN 2.50
12.95
1. on Handling
11.95
5 on
6.95
PB 2.12 Premium
ZN 2.54
11.61
1.00
5.00

Judging from the sampling of Jacobson and Leisk on the old 100 ft level, I would consider the prospect good for finding additional lenses of ore for 150 feet north of the north end of the present ore body. The grade is uncertain as Jacobson averaged 0.18 Au and 2.1 Ag with no lead or zinc given. Leisk average, at irregular intervals with no widths given, was 0.33 Au; 2.1 Ag: 1.4% Lead, no zinc given. Jacobsons average width of sample was 5.0 ft. It may be that Leisk sampled the narrower higher grade portions of the vein, yet the low lead content (1.4) would certainly not indicate that he had confined his samples to the streaks of better ore.

I think that the possibilities of finding commerical ore bodies below water level are excellent and the search for same fully justified, but the mill should be held in abeyance until the results of some development work are known.

Yours Truly.

Smelter Returns & Payments Based on Four Kings Contract

Au - 13.64 = 74.2 % of gross value
Ag - 230 = 74
PB - 323 = 33.125 "
ZN - 2.59 = 19
Total 21.76 less 80 cts for handling, $5.00 for treatment = 18.26
25.07

Premium
PB = 261
ZN = 420
TOTAL PREM = 681

Chloride, Arizona,
July 30th, 43.

Dear Chubby:

I am enclosing a letter written to Mr. Gohring and will send a copy of this to Mr. Davis. Both of which will save us some time.

Gohrings letter will tell you that we are about ready to go here and I am hoping that the pump gets here to-day so we will not have that hanging over us. Also hope that fellow gets here with timber any day but saturday.

The last round in the raise showed up a full face of low grade Oxidized ore, about 7ft wide. The following are assays I had made at the Tenne.

Grab of fines from last round--About 75% was fine material;

Au.18 hundreds; Ag 3.43 ozs; Pb 4%.

Grab of fines now in ore-bin. Taken from bunch in shaft , 5ft below tunnel level ;

Au. 0.34 ; Ag. 4.05; Pb. 3.1 %; Zn. 4.9%

Same--Coarse Ore
Au. 0.16; Ag. 3.48; Pb. 3.4%; Zn. 6.1%.

We are having a good deal of trouble with the soft ground plugging the drills. I hope that Liggett will soon get us some of the other bits.

The weather has been plenty hot, as when you where here . Have had some rain.

Lane was here yesterday. He certainly has plenty of hopes for this mine. He remarked that he did not feel there was a definate ore-body now in sight; but says it was--outside the Tenn. vein, the strongest in the district. And having values scattered all through it, he felt that some place a real ore-body must exist in it. He feels that where we are working is a good a place as any to look for this ore-body. He also said he was pleased with the work so far done.

Very Truly Yours,

Jos. P. K.

Chloride, Arizona,
August 10th, 43.

Dear Chubby:

Befor the day is over we will have the shaft timbered to the 45ft mark.

Ever thing we have taken out; since we left the "fault" will make a good grade of mill dirt and it seems to be gradually getting better. In fact the muck coming out to-day might ship. I have a good sample--Broken up and split-- will take a check to Kingman.

I feel confident that we can make a lot of shipping material out of the fines if we were fixed to Jig them. It will take quit a little work and some timber to rig up for this. The water question would require some dewatering devise for the tailings and there is none to good a place for tailings deposial; but it can be figured out if I am authorized to make the nescessary expendure. For this reason I would be very glad to see you as soon as possible.

They way the ore is acting I would not be at all surprised to see 7 or 8 ft of shipping ore any round and if so a few rounds will fill our bin. So please send instructions as to where to ship and what instructions should I give the smelter regarding settlement.

Following are assays not yet reported to you;

			Au	Ag	Pb	Zn
8/8	No I	Fines 6th set	0.34 --	I.62 --	0.7 --	6.2
8/8	2	Face Sample 6th	0.42	2.20	0.6 --	3.0 (9)
8/8	3	Fines below 6th	0.40	2.25	I.7 --	3.6
8/9	1	Fines 7th set	0.27	I.42	0.6 --	2.3
8/9	2	Four Mine Cars	0.I6	I.26	0.5 --	9.8

I am sure we will find that the next samples will be higher in Lead and not so much zinc. One Lense will show a lot of lead and the next a lot of zinc.

No timber delivered as yet so I will have to get some more from town. Will send a copy of this to Mr Davis,

Very Truly Yours

Jas. P.

SAMPLES NOT KEPT OVER 30 DAYS EXCEPT BY REQUEST

SAMPLES SENT US BY MAIL WILL RECEIVE PROMPT ATTENTION

CERTIFICATE OF ASSAY FROM LABORATORY OF

R. V. McALLISTER

ASSAYERS, CHEMISTS, METALLURGISTS

FRONT STREET

KINGMAN, ARIZONA

FLOTATION TESTS

CYANIDE TESTS

PHONE BLUE 252

Liberty Mines Operator

Aug. 13, 1943 194

MOHAVE MINER PRINT

OFFICE NUMBER	OWNER'S MARK	GOLD, PER TON OUNCES	GOLD, PER TON VALUE	SILVER, PER TON OUNCES	SILVER, PER TON VALUE	TOTAL VALUE GOLD & SILVER	COPPER PER CENT	LEAD PER CENT	ZINC PER CENT	PER CENT
10843	Silver Hill # 1 8/11	0.31		2.20	Grab Sample 48 ft. Down			2.45	6.50	
10844	" 2 "	0.24		2.20	" " 51 ft "			3.30	5.50	
10845	" 3	0.72		3.40	Hanging Wall Drillings 3 ft. in 53' Down			4.90	9.25	
10846	" 4	0.18		2.60	Grab Sample - 55' Down			4.30	3.95	
10847	" 5	0.27		4.90	Face Sample So End 58 ft Down 7' Wide			8.60	6.70	
10848	" 6	0.54		5.50	" " N. " " " 7' Wide			12.50	5.65	
10849	" 7	0.23		1.30	Fines Foot Wall at 50 ft.			0.75	5.10	

GOLD $35 PER OUNCE

SILVER 71 CENTS PER OUNCE

R V McAllister

REGISTERED ASSAYER

Chloride, Ariz.,
August I4th, 43.

Dear Mr. Davis:

I have no reply from my last letter to Chubby; a copy of which you have; so I feel that I will soon be seeing him. And when he comes what a surprise he will have.

The shaft is now down 58ft from the level ; having averaged about 5ft per day. We certainly have a splendid showing there. There being fully a ten foot vein. Three feet of which we are leaving over the timbers and the seven feet in the face. The enclosed assays will tell you the value. Our timbers are following the foot of this part of the vein very closly but the ore appears to be a little flatter so we may get under the most of it befor reaching the I00ft level. To do so would be an advantage in cutting a station there, but this may be just a roll in the hanging wall and the ore would then come back into the shaft again. If the present showing has any lenght and depth to it--YOU CERTAINLY HAVE A WINNER.

I have not been able to work in the shaft yesterday nor untill Monday the I6th. I ordered a R.R.Car on thursday but can get one untill Monday. The Ore bin is full as is the track--on both sides back to the roadway. This ore is too good to put over the dump , so we will have to find something else to do untill we can get some ore pulled out of the bin. I have the crew making a powder magazine.

The assaying done at the Tennessee is not very satisfactory. They do not check out with themselves nor Mc Allister. You will notice changed to Mc Allester.

This ore is very hard and much slower mucking; these facts pluss our attempt to get it as clean as practicable will slow up our footage.In a way I am sorry about this as I have felt that conditions such as they where, one should make 5ft per day and it looked this time like I was going to do it.,

Am sending you a little paper-weight so you can see what a specimen of the ore looks like,

Sincerly Yours,

Jno.P

Chloride, Ariz.
August I9th 43.

Dear Di:

I am wondering why you have not sent out the checks covering account on Sub.Req. NO IO. I have a copy of Gohring,s approval dated the 6th. I have been asked for one of the checks. Also the Assayer at the Tennessee expects to be paid twice a month; which I had hoped to do from Petty Cash Acc.

Chubby was here yesterday. I rather think that he was pleased at what he saw.

From Drillings into the Hanging wall and the face of the shaft bottom It now appears that we have a IOft vein of ore. All of which will be a good milling grade. Out of this we have shipped a little over IOO tons to the U.S.Smelting Co at Midvale, Utah.

Yours Very Truly,

Jos P Klein.

Chloride, Arizona,
August 25th, 43.

Dear Mr. Davis:

The following are to-days samples:

No I--5ft drill hole in hanging wall at 75ft
o.29 Au; 4.I6 Ag.; 5.2 Pb.; 2.3 Zn.

No 2 -- Car Sample of Ist Class taken at 80ft.
0.64 Au; I4.64Ag.; 7.7 Pb.; 5.8 Zn.

All of our ore is now above the shaft timbers; We do not know the exact width as none of our drill holes have reached the hanging-wall. We do know that it is four ft wide or better and all of a very good grade.

The U.S. Engineers have completed their sampling and surveying. One of them told me that their samples and maps would be available to the owner and advised me to have you write the Tuscon office. He intimated th t their report would be favorable and suggested that you might some Diamond-Drilling done for no cost. Write to J.H.Hedges--Dist. Engineer--U.S.B.M. Tucson, Ariz.

Mr.Murdock was here to-day and was well pleased with the showing as well as the work.

As regards the insurance on the Hoist man. In this case he is working underground and will be untill we raise the shaft through to the surface .

I am glad that we are to use voucher checks. The men will understand , without so much explanation, why their checks vary.

We are now down 90ft with the shaft and I am glad we are under the ore rather than over it. It will make station cutting much simpler.

Sincerly,

Tucson Farnham

Zone 28 August 27, 1943.

Mr. Jack How, General Manager,
Western Machinery Company,
760 Folsom St.,
San Francisco, California.

Dear Mr. How:-

Replying to your letter of August 25, 1943, it appears now that the Boggs and Hackberry will not justify a mill, especially since we have a favorable contract with the Iron King mill for treating our ore.

We have recently acquired and are now developing with RFC funds, the Silver Hill mine located at Chloride, Arizona. We have sunk a shaft all in ore now about from the 100 ft. to the 200 ft. level. From development so far it appears that we may have a mine, indicating a 7 ft. vein 0.3 gold; 2.5 oz silver; 4% lead; 6% zinc. If this continues to show width and develops depth and length we will want a mill. Even Farnham is now already mill minded and we regret that we have disposed of some of the equipment at Alvarado.

The next time you are in Los Angeles I'd like to have a chance to talk this all over with you, I have something in my mind that may interest you.

Yours very truly,

L I B E R T Y M I N E S,

By_____Prop.

September 17, 1943.

War Production Board,
Washington, D. C.

Attn: The Executive Secretary, Quota Committee,
Premium Price Plan, Copper, Lead and Zinc.

Dear Sir:

Since making my application for C Premium on zinc, I have received advice by wire that the average assay values on the first two cars shipped to Midvale to be milled and smelted were: AU .38 oz; AG 4.4 oz; P.B. 7.7%; Zn 5.8%.

I now quote from our application for second R.F.C. Loan, dated September 10, "The ore stockpiled and judging from many samples both grab and channel have an average content of AU .25 oz; AG 2.0 oz; P.B. 2.4%, Zn 4.8%" thus the weighted average of ore shipped (150 tons)&ore stockpiled (450 tons not 400 tons) would be AU .28 oz; AG 2.6 oz; P.B. 3.75%; Zn 5%. Moreover my operating manager advises me that under our present contract with U. S. Refining Company (a copy of which is now in the hands of O. M. Rait's office R.F.C.) After deducting per ton $3.25 for treatment; $1.50 trucking to Kingman and $5.00 freight to Midvale our realization less premiums would be ten cents per ton. My method of calculation was wrong. Mr. Farnham also advises me that he could not get terms from Iron King that would increase this realization. I will try again and see if it can be done.

I regret the confusion in the name of applicant and name of mine. Mr. Stroebel fully understands how this occurred and can explain it to you. If you wish, I will have Mr. Hedges, who is now in my employ, authorize the change. It would be almost impossible for us now to take the name of Valley View Mine. I wish I could.

Yours truly,

LIBERTY MINES

R. P. M. Davis

October 1, 1945.

Western Knapp Engineering Co.
760 Folsom Street,
San Francisco, California.

Attention Mr. Jack How.

Gentlemen:-

I have decided to express in written form what I wnet over the other day in my talk with Mr. Mayer.

We have a twenty year lease on the SILVER HILL mine, located in Chloride, Arizona. The Tennessee mine and mill and the SILVER HILL are both actually in the town of Chloride. Our vein parallels the Tennessee vein. Mr. Farnham, my operating manager and the engineers of the Bureau of Mines, have studied the geology and the vein structure of the two mines and agree that they are as alike as two peas. You know the Tennessee better than I do. I do know that they are in ore on the 1600 ft. level and have more ore in sight now than ever before in their history. Our ore carries from $5.00 to $7.00 more in precious metals and just about exactly the same in lead and zinc as the Tennessee ore.

Above the 100 ft. level Lessees have explored the vein for gold and lead discarding all zinc. Their work enlightens us as to the probable location of ore bodies below. I am not going into any detail regarding the mine. We can furnish you with a report by Charles M. Heron made in 1941 for Cecil Mudd also Farnham's report to the RFC.

We have secured a $20,000.00 RFC development loan and have applied for an additional loan. It is the opinion of the RFC, The Bureau of Mines and the Metal Reserve engineers that this mine has the ear marks of a big mine. It certainly has made an impression on them. The Bureau of Mines have indicated to us that they will probably drill the SILVER HILL vein structure, without cost to us. I have been assured of additional RFC money.

We have sunk a winze below the 100 ft. level to the 210 ft. level and we extracted from this hole 10 ft. x 8 ft. x 110 ft. - 570 tons of ore and proved an additional 180 tons by drilling the hanging wall. The width was 7½ ft. average. The average values were (excluding all high grade):

au. 0.28 ozs; ag 2.8 ozs; pb 3%; zn 4.9%

We have shipped four cars of sorted ore showing much higher value. By drifting, sinking and raising we should expose within the next six months a considerable body of ore and this will merely scratch the vein structure which apexes 4500 ft. in length within our property line.

I admit that the above is a very vague and superficial description. But the reports and an examination of the property by your engineer will answer all the questions.

We hope to have in sight within three months over ten thousand tons of ore equal to the above values. If and when this tonnage of ore has been blocked out and if your engineers are satisfied that much more ore is ahead, I want you to erect on the SILVER HILL property our Alvarado mill equipped with flotation to a capacity to equal the grinding capacity of the mill. I will carry a mortgage on the Alvarado mill to enable me to take depreciation with the understanding that eventually the Alvarado mill and equipment will be yours without cost. We will be responsible for upkeep. We will pay you One Dollar ($1.00) per ton for the first Forty Thousand (40,000) tons milled and Fifty (50¢) Cents per ton thereafter, but after and at any time after 40,000 tons have been milled, we will have the option to purchase the entire mill for Forty Thousand ($40,000.00) Dollars cash.

Now let us paint the blackest picture that we can. Let us assume that 10,000 tons was all the ore which could be extracted from the mine. Let us assume that you have spent $35,000.00 in moving, erecting and equiping the mill. That your salvage value of mill and equipment (including the Alvarado mill and equipment) was $25,000.00. You have received $10,000.00 as rental. You have won nothing. You have lost nothing. I have lost the Alvarado mill and equipment, unless this mill could still be used as a custom mill. I enclose a report from "Pay Dirt" Sept. 27, 1943. You know and I know that the Tennessee and Magma mills are now out of the picture. That there is little likelihood of any competition from a custom mill being in the district for some time to come. This might be a way out if the ore was exhausted in SILVER HILL mine. But I am betting on the SILVER HILL mine.

Let us carry on. If we mill 80,000 tons your returns will be the difference between your cost of erection and equipment as furnished by you and a gross of $60,000.00 or $80,000.00, based on whether or not we exercise our option to purchase. If we do not exercise our option to purchase you carry on at 50¢ per ton rental.

Tennessee tested our ore for extraction which is enclosed. Based on this test and the Tennessee Smelter contract, our net profit after deducting $12.00 per ton for operating costs (Heron estimate made in 1941 - mining, development and milling $7) would be $4.00 per ton without any premiums and $8.00 per ton with "A" premium only. I believe that you will agree that the "A" premium will probably carry on for some time.

What makes this mine most attractive is that its precious metals content makes it a mine after the duration.

This now may seem to you premature. I assure you that it is not. It takes time to come to a complete understanding of minds.

We want to take all the advantage of premiums that we can. Your revenue or return of capital starts when we start operations. Your profits are not accumulated in one year.

Please advise when we can go into further details and see if we can arrive at mutually profitable conclusions.

Yours very truly,

L I B E R T Y M I N E S

By_____Prop.

COPY

Los Angeles, California.
October 11, 1943.

Mr. Jos. F. Klein,
Box 262,
Chloride, Arizona.

Dear Joe:-

As per your letter of October 7, 1943, according to my calculation the average values of the ore extracted from the drifts on the 100 ft. level, that is the same level as the Lear tunnel, are:

au. .20 ozs; ag. 2.09 ozs; pb. 1.3%; Zn. 4.6%

According to the test made by Tenn Laboratory showing 11 to 1 ratio of concentration and 89.5% recovery in gold; 95% recovery in Silver; 95.8% recovery in Lead and 87.71% recovery in Zinc, our concentrates would contain the following:

1.989 ozs. gold; 21.23 ozs. Silver; 273.9 lbs. Lead; 887.59 lbs Zinc.

According to the Tenn contract with the Smelter they are paid:

$30 per oz. for Gold in Lead; $26 for gold in Zinc; 6½¢ less 1½¢ or 4¢ for 90% of Lead; 8¼¢ less 1½¢ or 6¾¢ for 90% of Zinc.

Therefore on this basis our concentrates would have the following values:

Gold $57.10; Silver $13.80; Lead $10.86; Zinc $53.91 or a total of 135.67 per ton of concentrates. From this total I have deducted $14.75, based on treatment $5.25; Trucking $1.50; Freight $8.00 and I have a balance of $120.92 or $11.00 per ton ore milled. Assuming a mining cost of $10; milling $2; Overhead 50¢; Mill rental 50¢. The above values represent a LOSS of $2 per ton without premiums, a profit of 56¢ per ton with "A" premium only; and with "A" and "B" premiums on Lead and "A", "B" and "C" premiums on Zinc a profit of $5.07 per ton.

Yours very truly,

L I B E R T Y M I N E S,

By_____Prop.

cc: LLF, WSS.

PS: Al Morrison was in L.A. the other day and called me on the phone and informed me that there was a car of Silver Hi ore on the Kingman siding.

Chloride, Arizona,
Nov . 24th. 43

Dear Mr. Davis:

We are loading out the 7th lot to-day, probably will be oilled out to-morrow.

All of this ore is from the raise. It is not so good as the ore in lot 6 nor is it as clean. My assays out of the Bin are. Fines Au. 0.26; Ag. 4.95; Pb 3.8; Zn. 6.3.-------- The coarse ore; Au.0.33; Ag. 5.II; Pb. 8.8; Cu. 0.9; Zn 8.2. In wieght I feel it will be about half fines and half coarse.

We have started to drift on the lower level; but after a few rounds will have to come back and do some more work in the shaft. Want to get the shooting away from the timbers befor doing the shaft work.

The ore in the raise has been a good width but has very rotten hanging wall. Can open a very small space without timbers, so it comes pretty slow. A few misplaced holes and one wouldn,t get back in there again. The raise is now up about 30ft from the bottom of the level.

Very Truly Yours,

Jos P Klein

SILVER HILL

Au, Ag, Pb

Mohave 8 - 7 T 23 N, R 18 W

William S. Segar, Box 243, Chloride '42
unclaimed 8-5-46

The Silver Hill mine, near Chloride, Arizona, is reported to be producing ore averaging 6 per cent zinc, 4.6 per cent lead, 30 ounces gold, and 2 ounces silver. The mine is being worked under lease by W. S. Segar, Box 243, Chloride. S. M. Hedges is in charge of the work.
Mining Cong. Journal 9/30/42

NAME OF MINE: SILVER HILL

COUNTY: MOHAVE
DISTRICT:
METALS: AU,ZN,AG

OPERATOR AND ADDRESS: DATE:		MINE STATUS DATE:	
5/1/44	Lessee: RPM Davis 2356 Hollyridge Drive Hollywood, California Jos. P. Klein, Supt. Box 262, Chloride	5/1/44	Closed RFC loan granted 1/44 Closed

NAME OF MINE: SILVER HILL
OWNER:

COUNTY: Mohave
DISTRICT:
METALS: Pb,Zn,Ag,Au

OPERATOR AND ADDRESS Date:		MINE STATUS Date:	
6/46	Jack Miller, Box 448, Kingman	6/46 10/46	Developing Shipping

DEPARTMENT OF MINERAL RESOURCES
State of Arizona
Field Engineer's Report

Mine SILVER HILL — Date July 20, 1943

District Wallapai, Mohave Co., Arizona — Engineer Elgin B. Holt

Subject

BRIEF REPORT

LESSEE: Liberty Mine; R.P.M. Davis, principal owner, 2356 Hollyridge Drive, Hollywood, California; L. L. Farnham, General Manager, Mayer, Arizona; Joseph P. Klein, Superintendent, Box 262, Chloride, Arizona.

METALS: Zinc, lead, gold and silver. Character of ore: Above the Cross-cut Tunnel level, the ore is oxidized material; but below that level, the ore is complex sulphide material, suitable for treatment by selective flotation.

LOCATION & AREA: This property is located at the western edge of the town of Chloride. It consists of 4 patented and 2 unpatented mining claims and one patented mill site.

MINE WORKINGS: The vein strikes N. 7 degrees W., and dips steeply E., or at an angle of 45 degrees. It is opened at intervals along its extent by five inclined shafts, sunk to the following depths: 78', 75', 80', and 155'; the No. 1, or main shaft, being sunk on vein to a depth of 225 feet. A cross-cut tunnel was driven by W. S. Segar some 3 years ago from the east side of the hill. This tunnel has a length of 345 feet and cuts Shaft No. 3 at 80' depth. At point where the cross-cut tunnel cuts vein there is a crushed and faulted ore zone about 20 feet wide. Drifts were run north on vein 200 feet and south 70 feet.

ORE SHOOT: Per an assay map furnished me by Mr. Klein, in the north drift mentioned there is an ore shoot 70 feet in length, by 2.4 feet wide. This shoot of ore is oxidized above drift and is all sulphide material below drift, mainly galena and sphalerite. On the said assay map a number of samples are plotted, showing the average metal values of this shoot to be as follows, to-wit:

Width	Zn-%	Pb-%	Au-oz	Ag-ozs
2.4 ft.	5.67	4.40	0.32	1.80

PRODUCTION: As to the ore production of this property, when it was operated years ago, there are no records available.

1941 PRODUCTION: One car was shipped to the Hayden smelter, with following results:

Tons	Au-oz	Ag-ozs	Cu-%	Pb-%	Net returns
36.6	0.358	2.3	0.19	3.70	$217.55

1942 PRODUCTION: During 1942, S. M. Hedges and wife shipped 4 or more car loads of ore from this property to the El Paso Smelting Works, of which the following is the records of 3 of these car shipments:

Tons	Au-oz	Ag-ozs	Cu-%	Pb-%	Zn-%	Net returns
42.8	0.78	3.70	0.435	5.25	3.20	$860.96
23.2	0.91	5.10	0.650	9.45	6.20	652.50
41.2	0.56	3.40	0.360	6.40	5.30	533.67

Sampling

Data follow on two samples taken in the face of the south drift 45 feet from shaft 2 on the 100-foot level:

No.	Description	Assays				
		Percent			Ounces per ton	
		Pb	Zn	Cu	Au	Ag
2279	0 to 2-1/2 feet from hanging wall	0.4	3.8	0.09	0.03	0.85
2280	2-1/2 to 7 feet from hanging wall	1.2	3.0	.14	.34	2.75

Mine Workings

The main workings of the mine are inaccessible because the old No. 1 600-foot inclined shaft is now caved at the collar. A fire destroyed the hoist house. It is reported that this old shaft had about 200 feet of drifting on the 100-foot level, about 300 feet on the 220 level, and the same amount on the 300-foot level. There is no drifting between the 300-foot level and the bottom of the 600-foot shaft.

The No. 2 shaft is about 200 feet north of the No. 1 shaft. It is a vertical, 1-1/2-compartment, timbered shaft in good condition. It is 115 feet deep, and from the bottom Producers Mines, Inc., drove a drift north on the vein for 125 feet to connect with an old prospect shaft or winze. This company stoped up on this block of ore until the stope broke into the old underhand stopes of earlier days, which are now caved. Mr. Beauchamp, the lessee, has started a drift to the south on the vein to connect with the 100-level workings of the caved No. 1 shaft.

Later Production

Ore shipments were made from June 1944 through July 1945. These amounted to 1,329 tons that averaged 4.85 percent lead, 4.94 percent zinc, and 0.21 percent copper. The precious-metal content per ton was 0.1935 ounce gold and 6.69 ounces silver. There was no production after July 1945.

LIBERTY (SILVER HILL) MINE

Location and Accessibility

This property is situated on Silver Hill, which is just west of Chloride and south of the highway. A good dirt road leads to the property from the highway. The claims are in sec. 4, T. 23 N., R. 18 W.

Ownership

The Liberty mine, on two claims, is owned by S. Seger, Box 243, Chloride, Ariz., and is operated by the Liberty Hill Gold Mines, Ltd. R.P.M. Davis of 2356 Hollyridge Drive, Hollywood, Calif., is the president of the company. Joe Cline of Chloride is the resident manager in charge of operations.

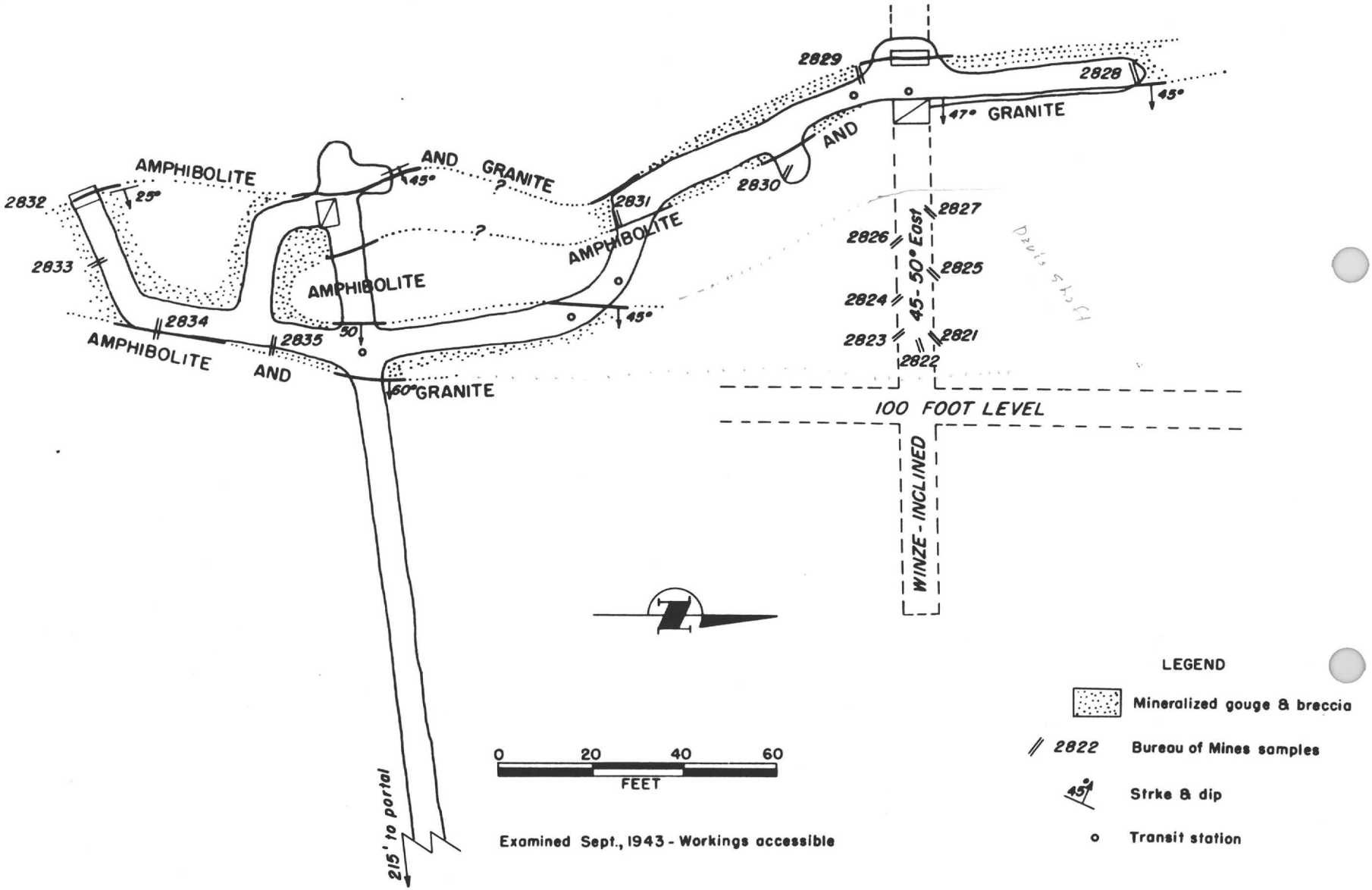


Figure 7. - Map showing sampling and geology of Liberty mine.

History and Production

This mine was one of the first discovered in this district, and lead-carbonate ore with high silver values was mined from the shallow surface workings. The sulfide ore was reached at a depth of 75 to 100 feet and, as it contained zinc, the operators were unable to handle it at a profit. The property was idle for a good many years. Some work has been done by lessees, and some production was reported in 1916.10/ The last of the lessees, S. M. Hedges and his wife, mined and shipped two small lots of ore in 1939. In December 1942, Hedges resumed operations and during the next 12 months shipped 211 tons that averaged 0.61 ounce per ton gold, 3.9 ounces per ton silver, 6.4 percent lead, and about 5 percent zinc. The average yield at the smelter after deducting rail freight was $14.48 per ton.

The present operators have shipped five carloads of sorted ore and have several hundred tons of low-grade material on the dump. The average metal content of the first three cars shipped was 6.4 percent lead, 6.1 percent zinc, 0.37 ounce gold, and 3.8 ounces silver per ton.

Ore Occurrence

The ore occurs as shoots and lenses in a fault zone that is up to 30 feet in width. The country rocks are altered pre-Cambrian granite and amphibole schist. The dip of the vein or fault zone is 45° east, and the strike is north 10° west. Recent work, financed by a loan from the Reconstruction Finance Corporation, has exposed a lens of sulfide ore 70 feet below the outcrop for a length of 125 feet, a height of 65 feet, and a thickness of 6 feet (fig. 7). An old shaft about 250 feet north of this ore lens is reported to be 125 feet deep. This shaft is now inaccessible. It probably was sunk on a lens of ore. Shallow surface workings at a number of places along the outcrop of the fault zone indicate that bunches of ore were found there in the past. Nine of these old workings are distributed along 950 feet of the outcrop.

Development

A crosscut was driven 325 feet west from the east side of the hill to intersect the fault zone. Drifts were driven in the fault zone both north and south from the crosscut. Crosscuts also have been driven to the footwall of the fault zone, and a connection was made with an old stope from the surface. The crosscut intersects the fault zone at a depth of 60 to 70 feet vertically below the outcrop. At a distance of 125 feet north of the crosscut a winze is being sunk 150 feet below the drift on an inclination of 46°. The dip of the vein is less than the inclination of the winze so that, at a depth of 60 feet, several feet of the ore shoot is in the hanging wall above the winze. A station was cut at the 100-foot level, and drifts were driven north and south. In the south drift the ore ended 15 feet from the winze. In the north drift the ore had pinched to virtually nothing at a distance of

10/ Federal Geological Survey, Mineral Resources of the United States, 1916.

60 feet from the winze (fig. 7). Operators' sampling on the main level shows lead and zinc values for about 50 feet south of the winze and a much shorter distance north of it. The ore exposures on the two levels suggest that the ore body rakes about 70° north. A little water was encountered at a depth of 80 feet, but at present the water level is being held at 140 feet. The flow of water is small. Half an hour of pumping each day suffices to keep the water down.

Water @ 80' Small flow

Sampling

Of the five cars of sorted ore that had been shipped by the present operator, returns were received on the first three, which assayed as follows:

Car	Percent		Ounces/ton	
	Pb	Zn	Au	Ag
First.....	8.6	5.5	0.40	4.7
Second.....	6.7	6.1	.36	4.1
Third.....	3.85	6.85	.36	2.7

The mine was shut down after January 1944. Shipments to Midvale, Utah, and to the Shattuck-Denn mill at Warren, Ariz., between September 7, 1943, and January 13, 1944, amounted to 447 tons averaging 6.80 percent lead, 5.88 percent zinc, and 0.48 percent copper, with 0.36 ounces gold and 5.2 ounces silver per ton.

Fifteen samples were taken in the mine (fig. 7); seven were taken in the winze and eight from various places in the old workings. Detailed data on these samples are shown in table 3.

TINTIC MINE

Location, Accessibility, and Ownership

The mine is situated about 2 miles by road west of Chloride on the paved highway that connects Chloride with U. S. Highway 93.

The property, two claims, is owned by Hawks and Shafer of Chloride and is leased to a partnership headed by Joseph G. O'Brien, and F. D. Shuck of Chloride.

History and Production

Few records of the early history of the mine are available. Intermittent production has been reported for the period 1925 to 1939.[11] Johnson and Fisher reportedly operated the property in 1934, 1935, and 1936. J. G. O'Brien recently reopened some of the mine workings with the aid of a loan from the Reconstruction Finance Corporation.

11/ Federal Geological Survey, Mineral Resources of the United States, 1925, 1928, and 1930.
Federal Bureau of Mines, Minerals Yearbook, 1937, 1938, and 1939.

R.I. 4101

TABLE 3. - Data on Bureau of Mines samples from Liberty mine

No.	Location	Description	Length, feet	Assays: Percent Pb	Percent Zn	Percent Cu	Ounces/ton Au	Ounces/ton Ag
2821	Winze, 75 ft. from collar, N. side.	Soft, talcy, sulfides	6.0	2.3	3.6	0.03	0.185	1.20
2822	Winze, 78 feet from collar, center of winze.	do.	4.5	2.6	3.8	.03	.125	2.95
2823	Winze, 75 ft. from collar, S. side.	do.	5.5	.4	.1	.02	.045	[illegible]
2824	Winze, 65 ft. from collar, S. side.	do.	5.2	4.3	5.4	.09	.260	2.15
2825	Winze, 55 ft. from collar, N. side.	do.	5.3	6.9	6.5	.02	.255	2.85
2826	Winze, 45 ft. from collar, S. side.	do.	6.0	1.4	3.7	.03	.730	1.10
2827	Winze, 35 ft. from collar, N. side.	do.	5.2	2.6	6.7	.20	.935	2.35
2828	North end of main tunnel, breast.	Soft, oxidized.	4.0	.3	.1	.03	.005	.40
2829	Main tunnel, 3 ft. S. of winze, W. side.	Soft, oxidized, some sulfide.	2.3	.2	.1	.02	.005	.50
2830	Small winze, S. side, 10 ft. below drift.	Heavy sulfide	5.2	7.1	3.2	.47	.360	3.95
2831	Main tunnel, 39 ft. S. of small winze.	Soft, partly oxidized some sulfide	2.8	.2	2.6	.02	.090	.60
2832	S. drift, SW crosscut, S. side.	Soft, talcy, oxidized some pyrite	4.2	.1	1.9	.04	.010	.40
2833	S. drift, crosscut SW 15 ft. NE of end of crosscut.	Soft, talcy, oxidized	6.0	.2	.8	.02	.010	.25
2834	S. drift 45 ft. S. of main crosscut.	do.	4.2	.5	1.1	.04	.070	.30
2835	S. drift, 20 ft. S. of main crosscut.	Soft, talcy, oxidized, some sulfide	4.0	3.1	.8	.04	.125	[illegible]

Description of the Deposit

The mine workings were flooded to within 30 feet of the collar of the main shaft when examined by the Bureau's engineers. The deposit contains lead, zinc, copper, and silver minerals, with a little gold, within a fissure vein that strikes northwest and dips 25° to 35° northeast.

Mine Workings

The principal workings are reported to consist of a 120-foot 2-compartment, vertical shaft, a 20-foot crosscut to the vein on the 120-foot level, and a total of about 250 feet of drifting both northwest and southeast on the vein at this level.

Sampling

Engineers[12] of the Reconstruction Finance Corporation examined the workings after the rehabilitation and sampled the vein east of the shaft. Over a width of 1.2 feet, the vein assayed 2.21 percent lead, 0.60 percent zinc, 0.70 percent copper, 0.01 ounce gold per ton, and 5.00 ounces silver per ton.

NEIL-LEWIS MINE

This property (one claim), situated about 1 mile by road west of Chloride, is owned by George R. Neil and Alfred S. Lewis of Chloride. The owners were unwatering and reopening the mine with the aid of an R.F.C. loan when it was visited by engineers of the Bureau of Mines.

The mine is opened by an inclined shaft about 100 feet deep with levels at 50 and 100 feet. The vein is oxidized on the 50-foot level. The 100-foot level was only partially cleared of water and cavings and was not accessible for examination. There is no reliable record of production or other data on ore in this mine.

COPPEROPOLIS MINE

The Copperopolis property (1 claim) is situated in Mineral Park about 6 miles by road south of Chloride. It is owned by a Mr. Kay and is leased to J. H. Hoffman of Kingman.

The shaft was filled with water when the property was visited by engineers of the Bureau of Mines. It is reported that a body of copper ore was exposed in the mine, but no evidence of such ore was found on the dump.

WHITE HORSE MINE

Location and Accessibility

This mine, on a group of three claims, is situated at the west entrance to Mineral Park, about 4 miles southeast of Chloride. The road to the mine is washed out in places, making it impassable.

12/ Lane and Frisbie.

Silver Hill Mine
Wm. S. Segar.

Freight	Shipped	Iso/	Fe	S.	CaO	90% adjust.	Final
299.53	574.03	45.4	15.4	17.3	.7		
300.42	533.94	50.8	13.7	16.2	.8		
302.39	385.77	53.8	12.9	16.1	.5	2118.81	235.42
384.65	336.09	52.0	14.4	17.3	.5	1340.42	151.16
389.96	187.35	54.0	14.0	17.0	.3		
297.67	1264.06 / 552.53					1071.33	119.02
270.92	643.17					501.94	
384.21	259.04	57.7	13.5	15.0	.8	809.95	55.78
	4280.92						
	4193.02					6423.83	

Fe	CaO	S	Al_2O_3	As	Sb	Cross	Net Shipped	190 RFC	Bonus
13.2	2.1	16.3	7.1	1.87	.15	17.44	228.10	25.35	193.44
10.7	.1	13.0	8.5	.77	.12 .03	13.54	5.75	.64	450.45
10.6	3.7	11.5	6.9	1.52	.35	16.22	120.99	13.44	
9.2							-31.10	0.0	171.47
15.9							752.81	64.89	740.57
14.5							754.24	66.59	608.78
12.2							452.68	34.78	509.22
9.3							45.49	00	212.31
[illegible]							-147.05	00	305.39
							48.28	00	179.87
16.3							859.08	76.91	846.07
13.9						12.67	554.39	47.03	1034.05
11.3						5.01	91.23	-	745.33
12.3						7.60	154.66	9.85	335.39
11.9	1.4	13.5				10.56	7.38	.82	
14.1	5	16.6				15.59	242.13	26.90	
12.4							626.37		1203.33
11.4							677.98		1133.95
15.8							960.59		687.90
15.5							734.29		529.90

Silver Mine

Fe	S	Cao	10% Acid	Final
289.03	594.03	45.4	15.4	17.3	.7		
300.42	533.94	50.8	14.7	14.2	.8		
309.37	395.57	53.8	12.7	14.2	.5	1,118.81	225.42
354.65	326.09	52.0	14.4	17.3	.5	1,160.42	151.64
289.92	187.06	54.0	14.0	17.0	.3		
297.67	(Cao) 0.6 233.53					1,071.32	119.04
270.42	643.17					801.44	
324.21	258.07	57.7	13.5	15.0	.8	809.85	85.78
	4,080.92						
	4,182.57					6,432.83	

Fe	CaO	S	Al_2O_3	Co	Cu	Cu+Co	Net Shipm	10% Acid	Remarks
13.2	2.1	16.3	7.1	1.87	.15	12.04	228.10	25.15	193.64
10.7	.1	13.0	8.5	.77	.12	12.81	5.15	.64	
10.6	3.7	11.5	6.9	1.52	.35	16.24	120.99	13.44	95.65
8.2							32.10	0.0	191.07
15.9							252.81	64.27	270.52
14.5							754.24	66.27	609.77
12.2							152.28	34.78	257.42
9.3							45.40	0.0	3.21.8
8.[illegible]							147.05	4.0	225.[illegible]
							42.28	0.0	149.47
16.5							339.50	94.[illegible]	840.[illegible]
13.9						11.67	374.37	47.06	1,334.[illegible]
11.3						5.01	31.22	-	742.12
12.3						14.[illegible]	154.65	7.85	535.27
14.9	1.4	13.5				14.32	2.36	.82	
14.1	.5	13.6				15.59	240.13	24.40	
12.4							626.37		1,003.33
11.4							437.98		1,133.13
15.8							560.57		687.10
15.5							334.29		527.9[illegible]

Finance Corporation, Arizona Department of Mineral Resources,
C.M. Heron Report, 1941 (U.S.G.S.) / D.K. Martin Files and Field investigation.

1943	Au	Ag	Pb	Zn	Cu
To: Oct 1943 223 Tons	0.335	3.89	6.28	6.08	0.36

Very similar that already listed for 1943

June 1944 thru July 1945 Sulphide ore

1,329 Tons	Au	Ag	Pb	Zn	Cu
	.1935 oz	6.69 oz	4.85 %	4.94 %	0.21 %

From 8-7-43
TO 12-19-1946 1828.324 Tons

Avg Au .269 Ag 3.55 Cu .41 Pb 5.0 Zn - 5.13
491.29 oz 6494.9 oz

Pg 23 28

Silverhill - West Base of hill.
Garnet bearing Aplitic granite
Aplite - Qtz & Alkali feldspar - fn grained & Sugary Texture

Introduction

The Silver Hill property consists of 3 patented claims and one patented mill site. The claims, called the Valley Vein, Sonoma & Silver Bell, are under Mineral Survey 1273A and total 60 acres, more or less. The Silver Bell Millsite is under Mineral Survey 1273B and contains 5 acres, more or less.

The Silver Hill claims are on a ridge about 150 feet high which lies immediately west of the town of Chloride. The claims are in the Wallapai mining district, Mohave County, Arizona. The claims are in a highly mineralized area of the Cerbat Range and geologically favorable for mine development.

Data were freely used from reports and maps of the Reconstruction

(over)

Silver Hill

Date				Au	Ag	Cu	Pb	Zn	Tons	Au	Ag
9-7-43	1	— 8003-A	Midvale	.405	4.11	.40	8.6	5.5	51.507	20.869	242
9-7-43	2	— "	"	.36	4.1	.26	6.8	6.15	57.344	20.643	235
9-16-43	3		"	.36	2.75	.29	3.85	6.85	57.747	20.789	159
10-11-43	4		"	.20	4.1	.52	6.15	5.85	56.573	16.972	232
10-14-43	5	8038-A	"	.22	3.85	.47	5.1	5.9	57.847	12.726	223
11-17-43	6	126	Shoshone Dump	.48	12.00	.95	13.4	5.45	58.272	27.971	699.266
12-7-43	7	139	" "	.42	6.72	.58	6.95	6.85	51.318	21.554	343.83
1-13-44	8	8038-A		.35	3.45	.36	3.8	4.65	56.816	19.886	196.02
				.36	5.2	.48	6.8	5.88	447.424	161.401	2330

Quota ↓ Cu A
Pb A-B
Zn A

				Au	Ag	Cu	Pb	Zn	Tons	Au	Ag
6-28-46	1094	ASR. El Paso		.37	2.4	.05	4.5	5.7	41.128	15.217	98.7
7-11-46	1285			.165	4.0	5.8	5.4	5.2	53.307	8.796	213.2
7-13 "	1308			.385	2.0	.1	3.6	4.2	39.7725	15.312	79.5
6-23 "		Menus Pick	1	.14	1.7	.10	1.17	4.24	100.332	14.046	170.6
6-28 "			2	.295	4.9	.65	6.15	5.10	79.494	23.451	389.5
8-6			3	.405	3.5	.45	5.00	7.70	67.222	27.225	235.3
9-9			4	.265	2.45	.26	3.22	6.20	80.263	21.270	196.6
			5	.165	2.0	.21	2.06	3.93	53.505	8.830	107.0
			6	.100	1.1	.16	1.77	3.32	90.201	9.021	99.2
			7	.165	1.8	.28	2.82	2.74	43.887	7.241	79.0
			8	.355	5.00	.52	8.47	6.08	68.892	24.457	344.5
10-4 "			9	.250	4.00	.33	7.59	5.93	63.944	15.986	255.8
10-7 "			10	.120	1.99	.10	2.97	3.88	90.329	10.839	179.8
10-15 "			11	.223	2.00	.14	2.72	4.27	42.956	9.579	85.9
10-27-46	USSR.		1	.20	1.9	.15	3.3	3.83	56.768	11.354	107.9
10-29 "			2	.24	3.6	.4	5.55	4.3	54.895	13.175	197.6
11-7 "			12	.205	4.1	.26	5.53	4.48	104.395	21.401	428.0
11-24 "			13	.24	3.9	.26	5.16	4.89	99.997	23.999	390.0
11-30 "			14	.36	3.1	.30	5.69	5.47	86.618	31.182	268.5
12-19 "			15	.295	3.84	.34	5.46	5.03	62.970	18.311	238.3
									1380.90	330.972	4164.9
									447.424	161.401	2330
				.249	3.55	.49	5.0	5.13	1828.324	491.093	6494.9

Date				Au	Ag	Cu	Pb	Zn	Tons	Au	Ag
-7-43	1	— 8002-A	Midvale	.405	4.7	.40	5.6	5.55	51.507	20.860	242
-7-43	2	— "	"	.36	4.1	.26	6.8	6.15	57.344	20.643	235
-16-43	3		"	.36	2.75	.29	3.85	6.35	57.747	20.788	159
-11-43	4		"	.20	4.1	.32	4.65	5.65	54.573	16.972	232
-14-43	5	8028-A	"	.22	2.85	.47	5.1	5.9	57.849	12.726	223
-17-43	6	126	Shattuck Dem	.48	12.00	.95	13.4	5.75	58.272	27.972	697.266
-7-43	7	139	" "	.42	6.70	.58	4.35	6.85	57.318	24.079	383.83
-13-44	8	8035-A		.35	3.45	.36	3.8	4.65	58.816	19.880	176.02
				.36	5.2	.48	6.9	5.38	447.434	161.401	2330

Quality ↓ Cu A
Pb A-B
Zn A

				Au	Ag	Cu	Pb	Zn	Tons	Au	Ag
28-46		1094	A.S.R.	.37	2.4	.05	4.5	5.7	44.138	15.217	95.7
11-46		1215		.165	4.0	5.8	5.4	5.2	53.307	8.796	213.2
13 "		1308		.385	2.0	.1	3.6	4.2	39.225	15.316	79.5
23 "		Marion Park	①	.14	1.7	.10	1.17	4.24	100.332	14.046	170.4
28 "			2	.295	4.9	.65	6.15	5.10	79.494	23.451	389.5
6			3	.405	3.5	.45	5.00	7.70	67.522	27.225	236.3
-9 "			4	.265	2.5	.24	3.20	6.20	77.262	21.270	196.6
			5	.145	2.0	.21	2.64	5.99	53.995	8.850	107.0
			6	.130	1.1	.16	1.97	5.32	70.217	9.021	93.2
			7	.195	1.9	.25	2.82	5.04	45.817	8.941	79.0
			8	.355	5.00	.52	9.47	6.05	69.977	24.457	349.5
-4 "			9	.250	9.00	.32	7.59	5.81	63.944	15.986	575.8
-7 "			10	.120	1.99	.10	2.97	3.89	90.337	10.839	179.8
-15 "			11	.223	2.10	.14	2.72	4.27	42.582	9.499	85.9
-27-46		USSR.	1	.30	1.9	.15	3.3	3.93	56.068	17.934	107.9
-28-46			2	.24	3.6	.4	5.35	4.3	54.895	13.175	197.6
-7 "			12	.205	4.1	.26	5.53	4.44	104.395	21.491	428.0
-24 "			13	.24	3.9	.26	5.16	4.89	99.997	23.999	390.0
-30 "			14	.36	3.1	.30	5.49	5.47	96.618	34.782	268.6
-19 "			15	.295	3.84	.34	5.6	5.03	62.970	18.341	238.3
									1380.90	330.724	4164.9
									447.434	161.401	2330
				.269	3.55	.47	5.0	5.13	1828.334	491.093	6494.9

	Cu	Pb	Zn	Gross value / ton	Net value / ton	Freight	Shipper	Iso/	Fe	S	CaO	% Admin.	Fin
	412	8859	5566	20.21	16.96	242.52	574.03	45.4	15.4	19.3	.7		
	287	7799	7053	17.80	14.55	300.42	533.94	50.8	12.7	14.2	.8		
	335	4431	7911	15.34	12.09	302.39	395.77	53.8	12.9	16.1	.5	2118.81 ✓	
	586	6958	6619	15.79	12.74	384.65	336.09	52.0	14.4	17.3	.5	1360.42 ✓	
	543	5900	6826	13.23	9.98	389.96	187.35	54.0	14.0	17.0	.3		
66	1107	15617	6352	2280.66		297.67	1264.06 1352.53					1071.33 ✓	
33	585	7133	7031	150.63		270.92	643.17					501.94 ✓	
02	409	4319	5284	4.73	11.48	374.71	258.04	57.7	13.5	15.0	.8	809.95 ✓	
	4276	61015	52642				4280.92						
							4193.02						6423.83
	186.60												
	2886.02												
	2229.27												
	5301.39												

	Cu	Pb	Zn	Ins	SiO2	Fe	CaO	S	Al2O3	As	Sb	Cross	Net shipm	1970 RFC
7	411	3702	3707 ✓	51.4	41.0	13.2	2.1	16.3	7.1	1.87	.15	17.44	228.10	25.35
2	6184	5759	5544	60.6	41.0	10.7	.1	13.0	8.5	.77	.12.03	13.54	5.75	.64
5	98	2864	3341	51.4	40.8	10.6	3.7	11.5	6.9	1.52	.35	16.32	120.99	13.44
6	200	2348	8508			9.2							-31.10	0.0
5	1049	9778	8029			15.9							752.81	64.89
3	605	6722	10352			14.5							754.24	66.59
6	417	5167	9953			12.2							452.65	34.78
0	225	2205	4206			9.3							45.49	00
2	289	3194	5990			9.6							-147.05	00
0	246	2563	2405										48.25	00
5	716	11670	8377			16.3							859.08	76.91
5	422	9707	7584			13.9						12.67	554.39	47.03
8	180	5366	7010			11.3						5.01	91.23	-
1	120	2337	3668			12.3						7.60	154.66	9.85
1	170	3747	4348	56.6		11.9	.44	13.5				10.96	7.38	.82
2	439	6093	4721	57.2		14.1	.6	16.6				15.59	242.13	26.90
0	543	11546	9771			12.4							626.37	
1	520	10320	9780			11.4							677.98	
5	520	9857	9476			15.8							960.59	
3	422	7026	6244			15.5							734.29	
9	13776	121969	135009											
	4276	61015	52642											
9	18052	182984	187651											

ag	cu	Pb	Zn	Gross value / ton	Net value / ton	Freight	Shipper	Fe	S	CaO	90% admin
242	412	8859	5566	20.21	16.96	277.53	574.03	45.4	15.4	17.3	.7	
235	287	7799	7053	17.80	14.55	300.42	533.94	50.8	12.7	16.2	.8	
159	335	4431	7911	15.34	12.09	302.39	395.77	53.8	12.9	16.1	.5	2118.81
232	588	6958	6619	15.77	12.74	354.65	336.09	52.0	14.4	17.3	.5	1360.42
223	543	5900	6826	13.23	9.98	389.92	187.55	54.0	14.0	17.0	.3	
699.266	1107	15617	6352	2890.00		297.67	1264.06 1552.53					1071.33
343.83	585	7133	7231	1505.53		270.92	643.17					501.94
196.02	409	4319	5284	14.70	11.48	374.21	258.04	57.7	13.5	15.0	.3	809.95
2330	4276	61015	52642				4280.92 4193.02					6423
	186.00 2886.02 2229.37 5301.39											

ag	cu	Pb	Zn	Ins	SiO2	Fe	CaO	S	Al_2O_3	As	Sb	Cross	Net shipm
98.7	441	3702	3707	51.4	41.0	13.2	2.1	16.3	7.1	1.87	.15	17.44	228.10
213.2	6184	5757	5544	60.6	41.0	10.7	.1	13.0	8.5	.77	.12	13.54	5.15
79.5	98	2864	3341	51.4	40.8	10.6	3.7	11.5	6.9	1.52	.35	16.22	120.99
170.6	250	2348	8508			9.2							-31.10
389.5	1049	9778	8027			15.9							752.81
235.3	605	6725	10352			14.5							754.24
196.6	417	5167	9953			12.2							452.68
107.0	225	2205	4206			9.3							45.49
99.2	289	3194	5990			9.6							-147.05
79.0	246	2563	2405										48.25
344.5	716	11670	8377			16.3							859.08
255.8	422	9707	7584			13.9						12.67	554.39
179.8	180	5366	7010			11.3						5.01	91.23
85.9	120	2337	3668			12.3						7.60	154.66
107.9	190	3747	4348	56.6		11.9	1.4	13.5				10.96	7.38
197.6	439	6093	4721	51.2		14.1	5	16.6				15.59	242.13
428.0	543	11546	9771			12.4							626.37
390.0	520	10320	9780			11.4							677.98
268.6	520	9957	9476			15.8							960.59
238.3	422	7026	6244			15.5							734.29
4164.9	13776	121969	135009										
2330	4276	61015	52642										
6494.9	18052	182984	187651										