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A

REPORT

on the

COLUMBIA-SILVER BELL MINE

Pioneer Mining District

Pinal County, Arizona

by

Richard E. Mieritz
Mining Consultant
Phoenix, Arizona

February 11, 1980

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INTRODUCTION:

At the request of and authorization by Mr. Donald D. Coleman, Phoenix, Arizona, the writer has prepared the following report on the Silver Bell-Martinez mining property in the Pioneer Mining District, northeastern Pinal County, Arizona. This report is based on factual data available such as old and near recent reports, old assay results, maps, etc. The writer personally visited the property on several occasions in 1957, 1970 and during the period of report preparation. In 1957, the writer prepared a report on the Martinez portion of the property and supervised some exploration work on the Martinez portion in 1970. The writer is quite knowledgeable, not only of the Martinez portion, but also of the Silver Bell-Columbia portion. The writer spent ten days on the property in late January, 1980 taking 65 samples, surface and underground surveying and doing a limited amount of geological mapping.

PROPERTY and LOCATION:

The property consists of three patented lode claims, Silver Bell, Columbia and Martinez (See Map No. 2) and 25 unpatented lode mining claims surrounding the patented claims, the names of which are shown on Map No. 2.

These unpatented mining claims are in good standing, current assessment work-wise and with the Bureau of Land Management registration.

Said claims are specifically located in parts of Sections 7, 8, 17, 18, 19 and 20 in T. 3 S., R. 12 E. and Sections 13 and 24 of T. 3 S., R. 11 E., G. & S. R. B. & M., Martinez Canyon, Pinal County, Arizona, about 60 airline miles southeast of Phoenix, Arizona.

ACCESSIBILITY:

The property is accessible by passenger automobile - at least to the "Camp" - at the present time. From Phoenix, travel eastward on U. S. Highway 60-70 through Tempe, Mesa, Apache Junction and Florence Junction. Continue east on the Highway for 3.8 miles to a gravel road junction on the right (south). From here to the Camp is 19.3 miles. Using the well traveled portion of this road over some large, moderately high hills and flat land and into "Box Canyon" for 15.6 miles, one encounters a "Y" in Box Canyon. A sign at this junction points the way to Silver Bell Mine. From here to the Camp is 3.7 miles. At 3.0 miles, a junction on the right leads to a corral - the left limb leads to the Camp.

The south access from Florence, Arizona, is over gravel road paralleling the Gila River and railroad to the east of Florence (10 miles), crossing same and up Box Canyon road to the referred to sign marked "Y" in Box Canyon, then to Camp. The distance from Florence to Camp by this route is 20 miles.

Both road routes are County maintained.

PHYSICAL FEATURES:

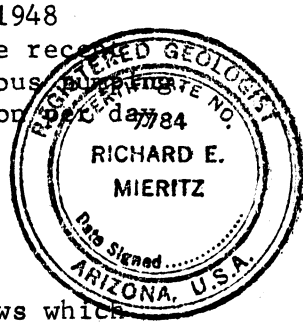
Rugged topographic features abound in the immediate mine vicinity. Recent erosion of the rhyolite flows creates steep near vertical pinnacles of great relief. A mean elevation for mining activity can be considered as 2700 feet above sea level with a range of elevation from 2400 feet down wash from the Martinez Mine to 3450 feet up slope above the Columbia-Silver Bell Mine.

Climate wise, the property is ideally situated to permit an uninterrupted annual operation. The one jeopardizing act of nature that could cause damage is flash flood conditions because the wash traversing the property is the only escape for rain waters precipitated north, east and south of the property. Flash flood conditions did exist in 1955 and for the most part obliterated several miles of road. Since destruction is possible by this means, precautions and preventive measures must therefore be considered for any new road alignment and construction, also for placement, installation and construction of new machinery and/or buildings.

FACILITIES:

The property is too remote for any modern day utility excepting a source of water. Gas (propane-butane) for heating and domestic purposes must be trucked from Florence or Apache Junction. Electricity for mine, mill and camp operation must be developed on the property. Timber for mining and construction purposes in carload lots must be trucked from Phoenix or Florence if brought by railroad.

An existing well located near the camp at the wash bottom can possibly supply the domestic requirements of a small camp. Water for mine and mill operation may have to be developed. A possible limited and unreliable (?) supply might be the water from below the 200 level of the Martinez Mine. A previous operator's correspondence in 1948 indicated the shaft sump could provide 160 gpm. Another more rec[illegible] source of information places the capacity at 15 gpm, continuous pumping. The latter figure is about ample to operate a mill at a 50 ton per day capacity.



GEOLOGY:

The property is situated in an area of Tertiary Volcanic flows which have been uplifted and distorted to some extent. Rhyolite and its many phases of mineralogical composition and physical textures is the principal country rock. Into this rock there has been intruded some later rhyolite and basalt-diabase series dikes. These dikes could have influenced the metallic mineralization.

Since metallic mineralization is associated with fractures and zones rather than with rock types or phases, no attempt has been made by the writer to differentiate the rhyolite phases. Surface mapping in the area was completed in a general way using physical characteristics such as erosional features, color, texture, etc., as a criteria for

classification and separation. Obvious rock types as dikes were mapped as observed.

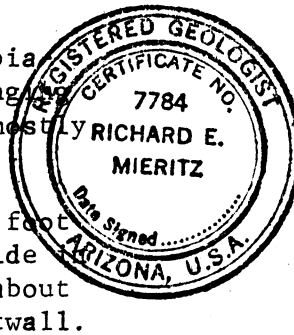
MINERALIZATION:

Metallic mineralization, lead, silver, some copper and a small amount of zinc, occurs as lenses within wide parallel zones of weakness in the rhyolite series. These zones are identified on the surface by the greater amount of iron oxide and quartz present in the zone as contrasted to the lesser degree in content in the various rhyolite phases.

The general trend on the zones of weakness is north-south and their dip is westerly at a moderate angle. Local strike and dip changes vary from N. 15 W. to N. 15 E. and 35 to 80 W. These changes apparently control "pay" mineral deposition. This criteria must be further studied and used in development of future ore reserves.

Lead and silver mineralization at both mines (Martinez and Columbia-Silver Bell) is contained in the minerals galena, a sulphide; cerrusite, a carbonate; anglesite, a sulphate; pyromorphite, a chloride and phosphate and the silver mineral cerargyrite.

Lead mineral distribution is somewhat sporadic, being moderately localized in areas of sufficient dimensions to spearhead and justify exploitation as stopes. The mineralization also shows a greater vertical tendency than horizontal, the control of which may be the changes or rolling of strike and dip directions combined with the cross-fracturing observed during the examination.



The Martinez vein structure is quite different than the Columbia-Silver Bell structure. Martinez has fair to good foot and hanging walls, is quartz filled - usually the sugary, vug type - and mostly lead as galena with quite low silver content.

The Columbia-Silver Bell structure has both good to excellent foot and hanging walls, is a shear zone ranging to 20 or 30 feet wide places, is somewhat brecciated and shows stress fractures at about 60° to the strike with tangential junctions mostly at the footwall. The structure is filled to a degree with calcite, fluorspar, silver minerals (oxides and sulphides) and spasmodic galena as disseminations or nodules up to a six inch size. Some copper oxides are occasionally present.

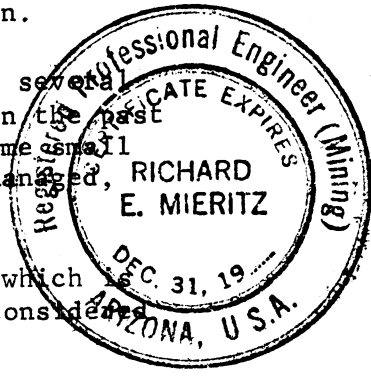
Clay and/or gouge is most frequently present on the footwall contact with hard, tough rhyolite and dispersed throughout the zone. The hanging wall is most frequently a white or light colored altered rhyolite.

The stress structures - an elongated or stretched "S" - are occasionally mineralized. Their junction with the footwall usually makes for greater silver concentrations. An example of this criteria is the junction of the "Hot Vein" with the footwall on the No. 3 Adit level, North Drift and the second crosscut to the east (right) at approximate coordinates N. 8080, E. 7920.

Structure presence and mineralization mode above the sublevel (3195) to the surface are quite complex and need to be worked out geologically. Silver mineralization occurs in the main ore zone (red ore), in the "Hot Vein", in hard siliceous rhyolite (within the zone) and in what is known as the gray ore on the surface in the "Pit".

DEVELOPMENT:

The Pinal Mining Co., at the turn of the century and in the teens, completed much underground development and some production. The price of silver and tenor of ore prevented a profitable venture except for the mining and/or gophering of the higher grade mineralization.



The mine is fairly well developed pre-operation-wise with several "stope" raises, "ore passes", sub-levels, etc. Lessees in the past have deviated from the normal pattern and have created some small problems but nothing that would seriously affect a well managed, systematic mining program or cause "lost ore" conditions.

Development completed thus far provides much information which is extremely useful to calculate reserves which now can be considered "ore" because of the high price of silver.

Development on the sub-level (3195) and below to the 5th level is more or less straightforward, however between the No. 3 Adit Level and the surface there are several short sub-levels not shown on the included maps except Map No. 4.

The writer has been in a majority of the workings, skipping those which now are not accessible because of having to cross "open raises or ore passes", muck filled from surface work or back filled, and raises or stopes which are ladderless or ropeless. These workings are, however, a minimum.

The Columbia-Silver Bell Mine has not been a productive mine as such - there being few "stopes" for the great amount of development that has been done horizontally and down dip. At the moment, there are several places in the "measured ore blocks" that can be "mined and stoped" after some "cleanup" and "dead work" have been completed.

Basically and justifiable, it is a mine which is ready to be mined and productive - underground and on the surface.

ORE RESERVES:

In 1920, Mining Engineer H. B. Starbird completed quite a sampling program of the Columbia-Silver Bell Mine. The location of the samples taken were metal tagged and number identified. His method of sampling was miner-like fashion - as he wrote - quote "Owing to the size of the veins, the drifts were entirely enclosed in them and the samples were taken by a cut 3 inches wide and 3 inches deep, from both sides of the drift and across the top making a section sample from 25 to 75 pounds in weight" - end of quote. From this point, the sample was crushed to 1/4" size, quartered and a small portion sent for assaying.

The writer could check the 3 inch width, but the depth was more like one to one and a half inches - none-the-less, the procedure was good.

At that time, Mr. Starbird calculated the following "Ore Reserve":

Ore-in-Sight	58,807 tons @ 8.48
Probable Ore	22,229 tons @ 8.73
Possible Ore	138,598 tons @ 9.91
	219,634 tons @ 9.41

The production information data available does not particularly identify how much ore was mined from each of the two mines, Columbia-Silver Bell and the Martinez. Lessees and previous operators probably mined a total of approximately 7,000 tons from the old "glory hole" and some of the stopes of which there are not too many. About 1600 tons of "open pit" ore mined is also included in the 7,000 ton figure.

Incomplete records indicate that approximately 1600 tons of ore were mined from the "Open Cut" and vicinity. One shipment record showed 290 tons contained:

Silver	10.32 ounces
Silica	73.2%
Total Insol.	79.3%
Alumina	7.4%
Iron	2.5%
Calcium Oxide	1.1%

Starbird's Ore-in-Sight and Probable Ore figures should not be too far off - from the writer's calculations - except for the interpretive calculations by each of the calculators.

In a "spot" check of the Starbird silver content ascribed to each "Block" of ore, the writer found his weighted average of the "block" to be just slightly (4-5%) higher than the content used by Starbird - thus, somewhat conservative.

During the present investigation and examination of the Columbia-Silver Bell Mine, the writer completed a limited sampling program. Sixty-three samples were taken in the mine workings and the results (silver content) are posted on the five Sample-Assay Maps, Nos. 10 through 14, one each for the No. 2 Adit Level, Sub-Level (3195), No. 3 Adit Level, 4th Level and the 5th Level. Twenty-one of these samples were taken at or near samples (and tags) taken by H. B. Starbird in 1920. Considering the oscillating nature of the mineralization, a pretty good "check" was obtained. Using Starbird's value as a "norm", the writer's samples were both higher and lower, the content having little bearing on the difference. The writer's samples were not as elaborately taken, but presumably representative of what was taken. As a matter of precaution and conservativeness, an equalizing factor will be used for determining the average content.

The identified calculated "Ore Blocks" and outlines are shown on Ore Reserve Maps Nos. 15 through 19.

Columbia - Silver Bell Mine

SAMPLE GUIDE and ASSAY RESULTS

Coleman Samples						Starbird Samples			
Sample No.	Width	Ounces Gold	Ounces Silver	Percent Lead	Percent Copper	Sample No.	Width	Ounces Silver	Sample Location
1607	7.5ft.	Tr.	5.40			3	8.0ft	12.40	No. 3 Adit, So. Drift.
1608	5.0	Tr.	5.84			8	5.0	9.40	" " " "
1609	4.0	Tr..	4.84	1.84		13	4.0	7.80	" " " "
1610	4.5	Tr.	6.78			19	4.0	3.20	" " " "
1611	6.5	Tr.	6.92	0.90		27	4.0	7.80	" " No. "
1612	6.5	Tr.	1.62			30	6.0	10.80	" " " "
1613	6.0	Tr.	0.90			35	5.0	2.60	" " " "
1614	5.0	Tr.	4.16	0.05		40	8.0		" " " "
1615	4.0	Tr.	6.26			1	6.0	5.60	Winze, No. 3 Adit to 4th Lv.
1616	5.5	Tr.	2.74			6	6.0	6.80	" " " "
1617	5.6	0.002	2.68			20	5.0	4.20	4th Lv., So. Drift.
1618	6.0	Tr.	8.44			23	4.0	2.80	" " "
1619	5.5	Tr.	11.26	4.18		27	5.0	11.40	" " "
1620	5.0	Tr.	2.70	2.66		31	4.0	13.60	" " "
1621	4.5	Tr.	2.64			36	5.0	4.00	" " "
1622	6.0	Tr.	11.32			39	8.0	12.00	" " "
1623	5.0 H	Tr.	2.30						No. 3 Adit, So. Dr., 1st X-cut, 0-5'
1624	5.0 H	Tr.	2.30						" " " " " " 5-10'
1625	5.0 H	0.014	0.29						" " " " " " 10-15'
1626	5.0 H	Tr.	2.40						" " " " " " 15-20'
1627	3.0 H	Tr.	2.04						" " " " " " 20-23'
1628	1.0 H	Tr.	0.18						" " " " " " 23-24'
1629	10.0 H	Tr.	3.54						" " " " , at "Y", N. wall.
1630	5.0 H	Tr.	5.50						" " " " , 2nd X-cut, 0-5'
1631	5.0 H	Tr.	8.08						" " " " " " 5-10'
1632	5.0 H	0.004	2.92						" " " " " " 10-15'
1633	5.0 H	Tr.	0.02						" " " " " " 15-20'
1634	3.0 H	0.010	0,44						" " " " " " 20-23'
1635	5.0 H	Tr.	5.70						" " , No. Dr., 1st X-cut, 0-5'
1636	6.6	Tr.	0.10			42			" " " "
1637	4.5	Tr.	0.80			44			" " " "
1638	5.0 N	Tr.	0.30						" " " " , 5' up Raise.
1639	4.0	Tr.	0.20						" " " " , at Raise face.
1640	3.0	0.008	1.24			50			" " " " , F.W. to H.W.

Columbia - Silver Bell Mine
SAMPLE GUIDE and ASSAY RESULTS

Coleman Samples						Starbird Samples			
Sample No.	Width	Ounces Gold	Ounces Silver	Percent Lead	Percent Copper	Sample No.	Width	Ounces Silver	Sample Location
1641	4.0 ft.	Tr.	Nil			50			No. 3 Adit, No.Dr., between faults in back
1642	6.0	0.028	1.02			10			Winze, 4th Lv. to 5th Lv., No. wall.
1643	6.5	0.026	19.67			11			" " " " " " "
1644	6.5	Tr.	4.50			12			" " " " " " "
1645	4.0	0.032	13.63			13			" " " " " " "
1646	4.0	Tr.	3.76			14			" " " " " " "
1647	4.5	0.014	12.87			15			" " " " " " "
1648	5.0	0.010	8.19			17			5th Lv., So. Drift.
1649	6.6	0.116	Tr.			18			" " " "
1650	5.5	0.184	0.50			19			" " " "
1651	4.0	Tr.	Nil						Wz, end of 4th Lv., So. Drift, down 4'.
1652	4.5	Nil	Nil						Wz. bottom, (sub lv.), as above
1653	5.0	0.274	Tr.						Wz. (sub lv.) E. wall, between Wz & Rs.
1654	3.75	0.0280	Tr.						Wz., No. face of sub. lv.
1655	1.75	0.016	1.19						Wz., up Rs 8 ft., No. wall.
1656	4.0 H	0.028	3.95						Wz. Station, So. wall, 0 -4'.
1657	5.0 H	0.004	4.92						" " " " " , 4 -9'.
1658	5.0 H	Tr.	2.40						" " " " " , 9-14'. H.W. @ 14'?
1659	5.0 H	0.028	0.32						" " " " " , 14-19'
1660	6.0	Tr.	2.94			6	5.0	6.80	No. 3 Adit, So. Drift.
1661	6.5	0.008	4.80			10	4.0	8.00	" " " " .
1662	6.0	0.020	2.86			15	4.0	1.20	" " " "
1663	4.0 N.	0.022	2.90						Wz. X-cut, No. 3 Adit, F.W. to east..
1664	6.0 N	0.010	0.69						" " " " 4' to 10 '.
1665	2.5	0.018	Tr.			51	6.0	7.60	Sub Lv.(3195) @ Rs-Wz, middle of Lv.
1666	4.5	0.020	18.74			55	6.0	4.00	Sub Lv.(3195), So Drift.
1667	3.0	Tr.	4.70						Sub. Lv., So. Drift, Face small stope.
1668	2.5	Tr.	13.78						" " " " " " " with visible Galena "eggs"
1669	5.0	0.016	4.11						Rs. 37' up, between No. 3 Adit & Sub Lv.
1670	2.5	0.024	Tr.						Across "gray ore"?- in Pit on surface.
1671		0.022	13.18		3.95				Hand picked of gray ore in muck-surface.
1672		0.014	7.79	19.60					Hand picked of gray ore with galena.

Samples were assayed by Walt Statler, Iron King Assay Office, Humboldt, Arizona., an Arizona Registered Assayer.

During the course of the sampling program, some geology - particularly the footwall and hanging wall of the structure - was mapped and is shown on Geologic Maps Nos. 5 through 9.

Ore blocks below the No. 3 Adit Level, north and south of the winze, as well as blocks from the No. 3 Adit Level to the Sub-Level (3195) above are more or less straightforward as the mineralization is within the "Main Zone".

Ore Blocks for the rest of the mine - above the No. 3 Adit Level and north of the winze, become somewhat confusing and complicated because there are four types of ore to be considered and each has its own structural control.

At approximate corrdinates N. 8080, E. 7920, the "Hot Vein" - steep S.W. dip - intersects the 45°S.W. dip of the main zone and creates a S.E. upward intersection and rake of one ore body. The second ore body is the continuation of the main zone to the north on the No. 3 Adit Level, up to the Sub-Level (3195) and up to the No. 2 Adit Level and perhaps the present surface. The situation is further complicated by the existence of the siliceous ore mined in the open cut and down to the No. 2 Adit or below as well as by the existence of the "gray ore" area (Maps Nos. 5, 10 and 15) which is now muck covered.

The writer has attempted to show the various blocks in the "confused" area by using a different color to demonstrate the extent of same on Ore Reserve Maps Nos. 15, 16 and 17.

Ore types are categorized and defined into three classifications which are:

Measured-Proven or Ore-in-Sight - measurable dimension-wise and metal content-wise on four sides.
Indicated or Probable - measurable on two or three sides dimension-wise and metal content-wise.
Inferred or Possible - measurable on one side dimension-wise and metal content-wise and geological projections in other directions.

The writer prefers the use of Measured, Indicated and Inferred word classifications because he opines that these words have more definitive meaning than Proven, Probable and Possible.

Starbird's sample widths and silver content of his samples have been used in the writer's calculations. In some areas where sample information was lacking, the writer's sampling and results were used. Check samples taken by the writer were not used except to determine a "factor of correction", if any, for the Starbird assay results.

Block dimensions were scaled horizontally to the nearest average five feet and the dip slope calculated by using the vertical height difference and dividing by the cosine-sine of 45° (.707). In the case of the "Hot Vein" block a dip angle of 65° was used for the intersection of it with the Main Vein. The "siliceous ore" and "gray ore" categories utilize vertical heights from the No. 2 Adit elevation to the surface at the respective locations because the geological

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information in these areas is somewhat sketchy at the present time.

Ore Blocks in the Main Vein and Hot Vein utilize mining thicknesses equivalent to the arithmetic average of the sample widths (lengths) influencing the block. The silver content of the block is a weighted average of the values of the samples influencing the block.

The Ore Reserves of the Columbia-Silver Bell Mine at this time and as calculated by the writer are:

Main Vein - MEASURED

	TONS		Oz/T.
Block M-I, So. Drift, 4th Lv. to No. 3 Adit Lv.	6,288	@	6.94
Block M-II, No. 3 Adit to Sub Lv.(3195)	4,505	@	8.20
Block M-III, No. Drift, No. 3 Adit to Sub Lv.(3195)	2,529	@	7.90
	13,322	@	8.30

Main Vein - INDICATED

Block Ind-I, So. Drift, No. 3 Adit to Sub Lv.(3195)	5,057	@	6.52
Block Ind.II. So. Drift, 5th Lv. to 4th Lv.	5,950	@	6.44
Block Ind.III, No. Drift, 4th Lv. to No. 3 Adit Lv.	4,847	@	6.25
	15,854	@	6.40

Main Vein - INFERRED

Block Inf-I, Sub Lv.(3195) to surface (3260)	6,090	@	7.71
Block Inf-II, So. Drift, 4th Lv. to No.3. Adit Lv.	816	@	8.50
Block Inf-III, No. Drift, 5th Lv. to 4th Lv.	1,213	@	9.23
	8,119	@	8.02

Hot Vein - INDICATED

Block Ind I, No. Drift, No. 3 Adit to No. 2 Adit	3,978	@	8.80

Siliceous - INDICATED

Block Ind I, No. 2 Adit Lv. to surface (20 feet)	6,667	@	11.50

Siliceous - INFERRED

Block Inf I, No. 2 Adit Lv. to surface (30 feet)	9,000	@	7.00
Grand Total	56,940	@	7.76

with an "in place" value of $11,046,360.-, @ $25.00/ounce.

It should be noted that no reserve was calculated for the "gray ore" area. The surface expression is "muck covered" from the pit debris and the underground expression of this zone on the No. 2 Adit Lv. is not accessible. Without evidence, only an educated "guess" can be made- which the writer opines would be approximately 1,500 tons of an unknown grade. Two hand picked samples from the muck, one with good [illegible] tent, ran 13.18 and 7.79 ounces silver.

Note also that the "siliceous ore" calculations are classed as "indicated" and "inferred". Surface expression of these blocks [illegible]

ORE RESERVE CALCULATIONS
COLUMBIA-SILVER BELL

Sheet 2

BLOCK NO. M-I
LOCATION, 4th Level to No. 3 Adit-So Drift.
TYPE Measured - Main

	Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT		Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT
1	20	5.0	4.2	21.0	21	40	8.0	12.0	96.0
2	21	5.0	2.4	12.0	22	43	7.0	10.6	74.2
3	22	5.0	0.4	~~2.0~~	23	44	6.0	5.6	33.6
4	23	5.0	0.5	2.5	24	45	6.0	5.8	34.8
5	24	4.0	2.8	11.2	25	49	5.0	8.4	42.0
6	25	4.0	2.0	8.0	26	50	6.0	9.8	58.8
7	26	4.0	3.0	12.0	27	51	5.0	8.8	44.0
8	27	5.0	11.4	57.0	28	52	5.0	4.4	22.0
9	28	4.0	8.6	34.4	29	53	6.0	6.4	38.4
10	29	4.0	9.8	39.2	30	9	6.0	3.2	19.2
11	30	4.0	5.8	23.2	31	8	6.0	1.6	9.6
12	31	4.0	13.6	54.4	32	7	6.0	8.2	49.2
13	32	4.0	9.6	38.4	33	6	6.0	6.8	40.8
14	33	6.0	6.4	38.4	34	5	7.0	4.6	32.2
15	34	7.0	10.0	70.0	35	4	7.0	6.0	42.0
16	35	6.0	8.8	52.8	36	3	7.0	4.8	33.6
17	36	5.0	4.0	20.0	37	2	6.0	7.0	42.0
18	37	6.0	5.4	32.4	38	1	6.0	5.6	33.6
19	38	8.0	12.0	96.0	39	1	6.0	6.8	40.8
20	39	8.0	12.0	96.0	40	2	6.0	7.0	42.0
	Total	103		720.9		Total	123		828.8
						Sub total Col. 1	103		720.9
						~~Total~~	226		1549.7

4th Lev. So Drift 44' to No. 3 Adit

Main Winze 44' to No. 3 Adit Level

No. 3 Adit Lev - Drift to So.

$$\frac{200' \times 70 \text{ u.d.}^* \times 5.39'}{12} =$$

6,288 tons @ 6.94 oz

Avg. Width 5.39'

Weighted Avg. Silver 6.94

Registered Professional Engineer (Mining)
CERTIFICATE EXPIRES
RICHARD E. MIERTL
DEC. 31, 19[illegible]
ARIZONA, U.S.A.

* u.d. = distance on slope of F.W.

ORE RESERVE CALCULATIONS
COLUMBIA-SILVER BELL

Sheet 2

BLOCK NO. M-1
LOCATION. 4th Lv to No 3 Adit-So Drift
TYPE Measured - Main.

	Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT		Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT
1	3	6.0	12.4	74.4	21				
2	4	5.0	7.6	38.0	22				
3	5	5.0	7.6	38.0	23				
4	6	5.0	6.8	34.0	24				
5	7	6.0	9.2	55.2	25				
6	8	6.0	9.4	56.4	26				
7	9	5.0	6.6	33.0	27				
8	10	4.0	8.0	32.0	28				
9	11	6.0	8.0	48.0	29				
10	12	5.0	7.2	36.0	30				
11	13	4.0	7.8	31.2	31				
12	14	5.0	6.4	32.0	32				
13	15	4.0	1.2	4.8	33				
14	16	4.0	4.2	16.8	34				
15	17	4.0	5.8	23.2	35				
16	18	4.0	3.2	12.8	36				
17	19	4.0	5.0	20.0	37				
18	20	5.0	6.8	34.0	38				
19	21	5.0	7.6	38.0	39				
20					40				1549.7
	Total	92		657.8		Total	226		~~1549.7~~ ~~657.8~~
						Sub total Col. 2	92		657.8
						Total	318		2207.5
							59	=	6.94

No-3 Adit Lv - So Drift

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ARIZONA, U.S.A.

Samp. Avg. Width 5.39'
Weighted Avg. Silver 6.94

ORE RESERVE CALCULATIONS
COLUMBIA-SILVER BELL

Sheet 1

BLOCK NO. M-II
LOCATION. No. 3 Adit to Sub Level (3195) N. & S. Drifts
TYPE Measured - Main

	Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT		Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT
1	5	5.0	7.6	38.0	21	53	6.0	6.8	40.8
2	4	5.0	7.6	38.0	22	54	6.0	7.0	42.0
3	3	8.0	12.4	99.2	23	55	6.0	4.0	24.0
4	2	6.0	7.0	42.0	24	1667	3.0	4.7	14.1
5	1	6.0	6.8	40.8	25	1668	2.5	13.78	34.5
6	23	8.0	8.4	67.2	26	1669	5.0	4.11	20.5
7	24	6.0	9.0	54.0	27	56	5.0	4.4	22.0
8	25	4.0	9.0	36.0	28	57	5.0	7.2	36.0
9	26	4.0	9.2	36.8	29				
10	27	4.0	7.8	31.2	30				
11	28	4.0	5.0	20.0	31				
12	29	4.0	9.6	38.4	32				
13	67	5.0	14.8	74.0	33				
14	66	5.0	9.6	48.0	34				
15	65	6.0	6.8	40.8	35				
16	64	6.0	6.4	38.4	36				
17	63	5.0	3.8	19.0	37				
18	58	6.0	8.0	48.0	38				
19	51	6.0	7.6	45.6	39				
20	52	7.0	9.2	64.4	40				
	Total	110		984.2	Total	38.5			233.9
					Sub total Col. 2	110.0			984.2
					Total	148.5			1218.1
						28			8.2

1 No 3 Adit - Sub Dr.
No 3 Adit - No. Dr.
Rz - Ore Chute No 3 Adit to Sub
Sub Lv.

Sub Lv.
Sub Lv.
Rz No 3 Adit to Sub - So. of Wz.
Sub Lv.

$\frac{120' \times 85'ud^{*} \times 5.3'}{12} = 4505$ Tons

4,505 Tons

Samp. Avg. Width 5.3 ft
Weighted Avg. Silver 8.2 oz

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CERTIFICATE EXPIRES
RICHARD E. MIERITZ
DEC. 31, 19....
ARIZONA, U.S.A.

*ud = distance on slope of F.W.

ORE RESERVE CALCULATIONS
COLUMBIA-SILVER BELL

Sheet 1

BLOCK NO. M-III
LOCATION. No. 3 Adit to Sub h.v. (3195) N. Drift.
TYPE Measured - Main

	Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT		Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT
1	61	7.0	6.6	46.2	21				
2	60	6.0	14.0	84.0	22				
3	59	7.0	8.2	57.4	23				
4	58	6.0	8.0	48.0	24				
5	51	6.0	7.6	45.6	25				
6	63	5.0	3.8	19.0	26				
7	64	6.0	6.4	38.4	27				
8	65	6.0	6.8	40.8	28				
9	66	5.0	9.6	48.0	29				
10	67	5.0	14.8	74.0	30				
11	30	3.0	6.0	18.0	31				
12	32	3.0	12.6	37.8	32				
13	33	6.0	11.0	66.0	33				
14	34	7.0	9.0	63.0	34				
15	35	5.0	2.6	13.0	35				
16	36	5.0	2.4	12.0	36				
17	37	8.0	1.8	14.4	37				
18	38				38				
19	39				39				
20	~~40~~	5.0	4.2		40				
	Total	92.0		725.6	Total				
					Sub total Col. 2		92.0		725.6
					Total		92.0		725.6

Ft - Sub h.v. to No. 3 Adit.

Sub h.v. - No. 3 Adit, N. Drift

Avg. $\frac{70 \times 85ud^* \times 5.1'}{12} = 2529$ (18)

2,529 Tons. @ 7.9 oz

Samp. Avg. Width 5.1 ft
Weighted Avg. Silver 7.9

*ud = distance on slope of F.W.

Registered Professional Engineer (Mining)
CERTIFICATE EXPIRES
RICHARD E. MIERITZ
DEC. 31, 19
ARIZONA, U.S.A.

ORE RESERVE CALCULATIONS
COLUMBIA-SILVER BELL

Sheet I

BLOCK NO. Ind. I.
LOCATION. No 3 Adit to Sub hr (3195) - Sa Drift
TYPE Indicated - Main

	Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT		Samp. No.	WIDTH Feet	Cunces Silver	PRODUCT
1	6	5.0	6.8	34.0	21				
2	7	6.0	9.2	55.2	22				
3	8	6.0	9.4	56.4	23				
4	9	5.0	6.6	33.0	24				
5	10	4.0	8.0	32.0	25				
6	11	6.0	8.0	48.0	26				
7	12	5.0	7.2	36.0	27				
8	13	4.0	7.8	31.2	28				
9	14	5.0	6.4	32.0	29				
10	15	4.0	1.2	4.8	30				
11	16	4.0	4.2	16.8	31				
12	17	4.0	5.8	23.2	32				
13	18	4.0	3.2	12.8	33				
14	19	4.0	5.0	20.0	34				
15	20	5.0	6.8	34.0	35				
16	21	5.0	7.6	38.0	36				
17	16A	5.0	4.11	507.4	37				
18					38				
19					39				
20					40				

Total 81.0 / 17 — 527.95

Total — 527.95
Sub total Col. 2 81.0 — 527.95
Total 81.0 / 17 — 527.95 / 6.52

Registered Professional Engineer (Mining) CERTIFICATE EXPIRES RICHARD E. MIERITZ DEC. 31, 19.... ARIZONA, U.S.A.

$\frac{150' \times 85'ud^* \times 4.76}{12} = 5,057$

5,057 Tons @

Samp. Avg. Width 4.76 ft.
Weighted Avg. Silver 6.52

*ud = distance on Slope of F.W.

ORE RESERVE CALCULATIONS
COLUMBIA-SILVER BELL

Sheet 1

BLOCK NO. Ind. II
LOCATION. 5th level to 4th lv. So. Drift
TYPE Indicated - Main

	Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT		Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT
1	1650	5.5	0.50	2.7	21	31	4.0	13.6	54.4
2	1649	6.6	Tr	0.0	22	32	4.0	9.6	38.4
3	1648	5.0	8.19	40.95	23	33	6.0	6.4	38.4
4	1647	4.5	12.87	~~57.92~~	24	34	7.0	10.0	70.0
5	1646	4.0	3.76	15.04	25	35	6.0	8.8	52.8
6	1645	4.0	13.63	54.52	26	36	5.0	4.0	20.0
7	1644	6.5	4.50	29.25	27	37	6.0	5.4	32.4
8	1643	6.5	19.67	127.86	28	38	8.0	12.0	96.0
9	1642	6.0	1.02	6.12	29	39	8.0	12.0	96.0
10	20	5.0	4.2	21.0	30	40	8.0	12.0	96.0
11	21	5.0	2.4	12.0	31	1651	4.0	Nil	
12	22	5.0	0.4	2.0	32	1652	4.5	Nil	
13	23	5.0	0.5	2.5	33	1653	5.0	Tr	
14	24	4.0	2.8	11.2	34	1654	3.75	Tr	
15	25	4.0	2.0	8.0	35	1655	1.75	1.19	
16	26	4.0	3.0	12.0	36				
17	27	5.0	11.4	57.0	37				
18	28	4.0	8.6	34.4	38				
19	29	4.0	9.8	39.2	39				
20	30	4.0	5.8	23.2	40				
	Total	97.6		556.86		Total	81.0		~~574.4~~
						Sub total Col. 1	97.6		556.86
						Total	178.6		~~1130.56~~ 1151.26

5th lv. So. Dr. to 4th lv. So. Drift

4th lv. So. Drift to 5th lv. So. Drift

5th level, So. Drift to 4th lv. So. Drift

5th lv. So. Drift

4th lv. So. Drift to 5th lv. So. Drift

$\frac{200' \times 70 ud.^{*} \times 5.1}{12} = 5950$

5950 tons @ 5.95 ft.

Samp. Avg. Width 5.14

Weighted Avg. Silver 6.44

*ud = distance on Slope of F.W.

Registered Professional Engineer (Mining)
CERTIFICATE EXPIRES
RICHARD E. MIERITZ
DEC. 31, 19
ARIZONA, U.S.A.

ORE RESERVE CALCULATIONS
COLUMBIA-SILVER BELL

Sheet 1

BLOCK NO. Ind. III
LOCATION. 4th Level to No. 3 Adit - No. Drift.
TYPE Indicated - Main

	Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT		Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT
1	9	6.0	3.2	19.2	21	35	5.0	2.6	13.0
2	8	6.0	1.6	9.6	22	36	5.0	2.4	12.0
3	7	6.0	8.2	49.2	23	37	8.0	1.8	14.4
4	6	6.0	6.8	40.8	24	1614	5.0	4.2	21.0
5	5	7.0	4.6	32.2	25				
6	4	7.0	6.0	42.0	26				
7	3	7.0	4.8	33.6	27				
8	2	6.0	7.0	42.0	28				
9	1	6.0	5.6	33.6	29				
10	23	8.0	8.4	67.2	30				
11	24	6.0	9.0	54.0	31				
12	25	4.0	9.0	36.0	32				
13	26	4.0	9.2	36.8	33				
14	27	4.0	7.8	31.2	34				
15	28	4.0	5.0	20.0	35				
16	29	4.0	9.6	38.4	36				
17	30	3.0	6.0	18.0	37				
18	32	3.0	12.6	37.8	38				
19	33	6.0	11.0	66.0	39				
20	34	7.0	9.0	63.0	40				
	Total	110.0		770.6	Total	23.0			60.4
					Sub total Col. 1	110.0			770.6
					Total	133.0			831.0
						24			

Wt. 4th Level to No. 3 Adit

No. 3 Adit to No. Drift.

Registered Professional Engineer (Mining)
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RICHARD
E. MIERITZ
DEC. 31, 19
ARIZONA, U.S.A.

1/2 x 150' x 70' ud* ~~5.54~~ 4847
12

4847 Tons @ 6.25 oz

Samp. Avg. Width 5.54 ft
Weighted Avg. Silver 6.25

*ud. = distance on Slope of F.W.

ORE RESERVE CALCULATIONS
COLUMBIA-SILVER BELL

Sheet 1

BLOCK NO. Inf. I
LOCATION Sub Lv. (3195) to Surface (3260)
TYPE Inferred - Main

	Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT		Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT
1	61	7.0	6.6	46.2	21				
2	60	6.0	14.0	84.0	22				
3	59	7.0	8.2	57.4	23				
4	58	6.0	8.0	48.0	24				
5	51	6.0	7.6	45.6	25				
6	52	7.0	9.2	64.4	26				
7	53	6.0	6.8	40.8	27				
8	54	6.0	7.0	42.0	28				
9	55	6.0	4.0	24.0	29				
10	56	5.0	4.4	22.0	30				
11	57	5.0	7.2	36.0	31				
12	1667	3.0	4.7	14.1	32				
13	1668	2.5	13.8	34.5	33				
14					34				
15					35				
16					36				
17					37				
18					38				
19					39				
20					40				
	Total	72.5		559.0		Total			
						Sub total Col. 1	72.5		559.0
						Total 13	72.5		559.0

Sub-Level (3195)

Registered Professional Engineer (Mining)
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DEC. 31, 19—
ARIZONA, U.S.A.

$$\frac{145' \times 90' ud^* \times 5.6}{12} = 6090$$

6090 tons @

Samp. Avg. Width 5.6 ft
Weighted Avg. Silver 7.71

*ud = distance on slope of F.W.

ORE RESERVE CALCULATIONS
COLUMBIA-SILVER BELL

Sheet 1

BLOCK NO. Inf. II
LOCATION. 4th Lv. to No. 3 Adit, So. Drift
TYPE

	Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT		Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT
1	21	5.0	7.6	38.0	21				
2	40	8.0	12.0	96.0	22				
3					23				
4					24				
5					25				
6					26				
7					27				
8					28				
9					29				
10					30				
11					31				
12					32				
13					33				
14					34				
15					35				
16					36				
17					37				
18					38				
19					39				
20					40				

Total 13 | 134.0 | Total ____ | ____

2 = 6.5', use 5 | 10.3, use 8.5 | Sub total Col. 2 ____ | ____

Total ____ | ____

$$\frac{40' \times 49' \text{ud}^* \times 5'}{12} = 816$$

816 tons @ 8.5 oz

Samp. Avg. Width 5.0
Weighted Avg. Silver 8.5

*ud = distance on slope of F.W.

Registered Professional Engineer (Mining)
CERTIFICATE EXPIRES
RICHARD E. MERITZ
DEC. 31, 19--
ARIZONA, U.S.A.

ORE RESERVE CALCULATIONS
COLUMBIA-SILVER BELL

Sheet 1

BLOCK NO. Ind. III
LOCATION. 5
TYPE Inferred - Main

	Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT		Samp. No.	WIDTH Feet	Cunces Silver	PRODUCT
1	1647	4.5	12.87	57.92	21				
2	1646	4.0	3.76	15.04	22				
3	1645	4.0	13.63	54.52	23				
4	1644	6.5	4.50	29.25	24				
5	1643	6.5	19.67	127.84	25				
6	1642	6.0	1.02	6.12	26				
7					27				
8					28				
9					29				
10					30				
11					31				
12					32				
13					33				
14					34				
15					35				
16					36				
17					37				
18					38				
19					39				
20					40				
	Total	31.5		290.71		Total			
						Sub total Col. 2	31.5		290.71
						Total	31.5		290.71

With 6th by. to 4th level.

Registered Professional Engineer (Mining) CERTIFICATE EXPIRES RICHARD E. MIERITZ DEC. 31, 19__ ARIZONA, U.S.A.

$\frac{1/2 \times 40 \times 70}{12} = 1213$

1213 tons

Samp. Avg. Width 5.2 ft
Weighted Avg. Silver 9.23 oz

*ud = distance on Slope of F.W.

ORE RESERVE CALCULATIONS
COLUMBIA-SILVER BELL

Sheet 1

BLOCK NO. Ind. I.
LOCATION. No 3 Adit Lv. to No. 2 Adit Lv.
TYPE Indicated - Hot Vein

	Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT		Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT
1	36	5.0	2.4	12.0	21	70	8.0	5.8	46.4
2	35	5.0	2.6	13.0	22	71	8.0	10.8	86.4
3	34	7.0	9.0	63.0	23	72	8.0	10.2	81.6
4	33	6.0	11.0	66.0	24	73	7.0	8.6	60.2
5	32	3.0	12.6	37.8	25	74	7.0	8.4	58.8
6	30	3.0	6.0	18.0	26	75	7.0	11.2	78.4
7	88	6.0	10.6	63.6	27				
8	87	5.0	11.2	56.0	28				
9	86	6.0	14.8	88.8	29				
10	85	5.0	13.2	66.0	30				
11	84	6.0	13.6	81.6	31				
12	83	6.0	3.8	22.8	32				
13	82	5.0	8.2	41.0	33				
14	81	6.0	8.6	51.6	34				
15	80				35				
16	79	6.0	4.8	28.8	36				
17	78	7.0	7.6	53.2	37				
18	77	7.0	7.8	54.6	38				
19	68	7.0	11.0	77.0	39				
20	69	8.0	5.4	43.2	40				
	Total	109		938.0		Total	45.0		411.8
						Sub total Col. 1	109.0		938.0
						Total	154.0		1349.8

No. 3 Adit Lv. No. Drift

Ft - One chute 8 feet, No. 3 Adit Lv. to No. 2 Adit Lv.

Registered Professional Engineer (Mining) CERTIFICATE EXPIRES RICHARD E. MIERITZ DEC. 31, 19 ARIZONA, U.S.A.

$$\frac{70' \times 110' \text{ud.}^* \times 6.2}{12} = 3,978$$

3,978 tons @ 8.8 oz

Samp. Avg. Width 6.2 ft
Weighted Avg. Silver 8.76

*ud = distance on Slope of F.W.

ORE RESERVE CALCULATIONS
COLUMBIA-SILVER BELL

Sheet 1

BLOCK NO. Ind. I
LOCATION. No 2 Adit to Surf. (3260)
TYPE Indicated - Siliceous

	Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT		Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT
1	1	11.0	10.2	112.2	21				
2	2	7.0	9.8	68.6	22				
3	3	6.0	14.2	85.2	23				
4	4	12.0	6.6	79.2	24				
5	5	5.0	13.6	68.0	25				
6	7	6.0	5.2	31.2	26				
7	9	7.0	3.2	22.4	27				
8	10	5.0	13.2	66.0	28				
9	11	4.0	31.4	125.6	29				
10	12	4.0	24.8	99.2	30				
11	13	4.0	15.8	63.2	31				
12	14	5.0	11.4	57.0	32				
13	15	7.0	15.4	107.8	33				
14	16	5.0	2.8	14.0	34				
15	17	14.0	13.6	190.4	35				
16	18	17.0	10.0	170.0	36				
17	19	14.0	11.8?	165.2	37				
18					38				
19					39				
20					40				

No. 2 Adit Lv. E. drift.

No. 2 Adit Lv. Middle Drift

Sub. above No. 2 Adit.

Total 133 / 17 — 1525.2

Total — —
Sub total Col. 1 133 — 1525.2
Total 133 / 17 — 1525.2

Registered Professional Engineer (Mining)
CERTIFICATE EXPIRES
RICHARD E. MIERITZ
DEC. 31, 19—
ARIZONA, U.S.A.

100' x 40' x 20h. = 6667 / 12

6667 tons @ 11.5 oz

Samp. Avg. Width 7.8
Weighted Avg. Silver 11.47

ORE RESERVE CALCULATIONS
COLUMBIA-SILVER BELL

Sheet 1

BLOCK NO. Inf. I
LOCATION. No 2 Adit pr to Surface (32
TYPE Inferred-Siliceous

	Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT		Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT
1	4	25.0	12.8	320.0	21				
2	5	12.0	22.6	271.2	22				
3	6	10.0	18.4	184.0	23				
4	7	4.0	10.6	42.4	24				
5	8	25.0	7.4	185.0	25				
6	10	10.0	6.8	68.0	26				
7	11	15.0	2.4	36.0	27				
8	12	12.0	7.8	93.6	28				
9	20	20.0	10.2	204.0	29				
10	21	5.0	11.0	55.0	30				
11	22	14.0	7.4	125.8	31				
12					32				
13					33				
14					34				
15					35				
16					36				
17					37				
18					38				
19					39				
20					40				

Total 152. 1585.0 Total

Sub total Col. 1 152.0 1585.0

Total 152.0 1585.0

Registered Professional Engineer (Mining) CERTIFICATE EXPIRES RICHARD E. MIERITZ DEC. 31, 19— ARIZONA, U.S.A.

$\frac{80' \times 45' w \times 30' h}{12} = 9000$ tons

9000 Tons - 7.0 oz

Samp. Avg. Width 13.8 ft

Weighted Avg. Silver 7.0 (10.4 Used)

been "muck covered" by the pit operation.

The outlines of the various blocks calculated are shown on Ore Reserve Maps Nos. 15 through 19. Block dimensions - length, width and thickness - are shown as well as the tonnage.

The writer's Ore Calculation Work Sheets for each block are herein included at the end of the Report.

GEOLOGIC ORE POTENTIAL:

The Columbia-Silver Bell mineralized zone for the most part measures 25 to 30 feet wide, footwall to hanging wall. (See Geologic Maps Nos. 5 through 9.)

Development to date concentrated, for the most part, on the footwall portion of the zone. Occasionally, cross-cuts to the hanging wall were driven and perhaps sampled but results are lacking. A portion of the samples taken by the writer included sampling of a few such cross-cuts. Moderate silver mineralization was indicated by the sample results. Thus, the Main Zone could well be wider than the normal 5 to 6 foot width drifted on and stoped.

The structure itself is strong and its surface expression indicates a long strike length to the south of the present workings. The faces of the south drifts on the Sub-Level (3195), No. 3 Adit Level, the 4th Level and the 5th Level all show silver mineralization of "ore" value. An ore potential to the south should be of great importance to mine life extension.

Work in these directions would materially increase "ore" reserves.

ORE CALCULATION COMPARISON:

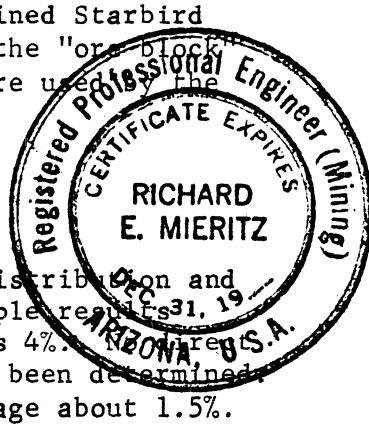
A first glance comparison of Starbird's Ore Reserves and those of the writer indicates a considerable difference in the stated Reserves. Eliminating Starbird's "inferred" ore, the balance is 81,100 tons as "ore-in-sight" and "indicated" classifications. Operators and lessees extraction further reduces the figure - say to 74,000 tons.

It should be noted that Starbird used a factor of 10 cubic feet to the ton whereas the writer uses 12 cubic feet. Starbird's 74,000 tons would thus be reduced to 61,600 tons.

Size, extent and limitations of "ore blocks" most generally are the judgment of the person doing the calculations, however, in these calculations, both Starbird and the writer have similar ore blocks - K plus L for Starbird and M-I for the writer. Starbird reported 14,700 tons whereas the writer shows 6,300 tons, a considerable difference.

The writer's calculations are shown on calculation work sheet Block M-I (2 sheets). Measurements can be checked on Ore Reserve Map No. 18. Starbird must have used approximately the same horizontal and dip slope

measurements. He did use 10 as a cubic factor which creates some difference, however, calculating backwards it was determined Starbird had to use an average of 10.5 feet for the thickness of the "ore block" to obtain the 14,700 ton figure, or about twice the figure used by the writer.



ASSOCIATED METALS:

Lead, as galena, the sulphide is present, however, its distribution and association with silver is very erratic. Starbird's sample results indicate the lead values range from zero to plus or minus 4%. No direct or inverse ratio between silver and the lead content has been determined. A lead content for the calculated ore reserve could average about 1.5%.

The erratic lead distribution would make for difficult "mill head" control in any milling operation - one day 2.4% lead, the next day 0.2% lead.

Previous reports on the Columbia-Silver Bell Mine have indicated the presence of fluorspar, barite and scheelite. The writer has made no mineralogical study of the ore, but is of the opinion that these minerals would be much more erratically distributed and in amounts much less than the lead contents. Again, a difficult "mill head" control problem.

Starbird failed to mention gold values in the Columbia-Silver Bell Mine. It is not known if his samples were so assayed. None-the-less, all samples taken by the writer were assayed for both gold and silver. This metal, as other associated minerals, is erratic in its distribution. Assay results of the writer's samples showed one range from nil to 0.004 ounces with a predominance of the samples showing a trace. 30% of the samples show a range of 0.01 to 0.02 ounces. A high of 0.274 ounces gold was found in a sample in the Winze near end of So. drift on the 4th Level. The erratic gold distribution would not create a mill head problem when using cyanide.

EXPLORATION:

Future ore development lies in exploring the southern extension of the main structure as well as its depth in the vicinity of the present mine. Such development is slow and expensive because it must be done by underground drifting. Surface drilling is not a practical approach as surface access by roads would be extremely and prohibitively costly.

The writer's suggested plan is to advance the South Drift of the No. 3 Adit Level along the footwall of the structure - 500 feet, 1,000 feet - so long as ore is developed or until the geologic conditions dictate a stoppage. The Sub-Level (3195) drift should also be advanced to the south.

It has been indicated by others in the past and substantiated by the writer's sampling in some of the various cross-cuts on the No. 3 Adit Level that silver mineralization does exist toward the hanging wall

beyond the normal 5 or 6 foot width primarily prospected by the present mine development. A quick, relatively inexpensive way to prospect the entire width of the zone - footwall to hanging wall - is long hole drilling using a jack hammer and air leg. Holes normal to the strike can be drilled along the drifts at 10 foot intervals, to footwall or hanging wall as the conditions dictate. Samples should be taken every 3 feet until either of the walls is encountered. The footwall would be hard and easily determined by the drilling rate. The hanging wall is an altered, white rhyolytic material and there would be an abrupt change in sludge color - brown or red to white or cream - when encountered. Three samples taken by the writer in this material showed less than one half ounce silver.

To start with, the writer suggests that the So. Drift on Sub Lv. (3195) be advanced as mining is being done on Block M-II. This work would change Block Ind. I to measured ore and at the same time prepare the block for mining and near future production. A 5' X 7' by 5 feet deep round would provide 15 tons toward the daily production rate, the balance coming from Block M-II.

The long hole drilling program should start at the north end of Ore Reserve Block M-III on the No. 3 Adit Level and progress southward to the face of the So. Drift. When completed, this program can be moved to the Sub Lv. (3195).

PRE-MINING PREPARATION:

Aside from the construction of a road from the Camp to the portal of the No. 3 Adit Lv. of the mine, pre-mining preparation and cleanup (dead work) would be required. This includes muck removal, some track laying, chute repair, ladder installation and Raise preparation as timbering, etc. Water and air lines must be checked. Installation of electric lights would be a convenience.

The underground workings recipient of such work is the haulage drift on the No. 3 Adit Lv. to just beyond the second cross-cut, the two cross-cuts, the first 200 feet of the No. Drift and all of the So. Drift on the No. 3 Adit Lv., the first Raise in the So. Drift up to the Sub Lv. (3195) and the Sub Lv. to and beyond the (Wz/Rs) to the north.

To prepare the Siliceous Ore Blocks for mining, the Pit area must be cleaned and the No. 2 Adit Lv. and portal must be cleaned, etc., similar to the work required as mentioned above for the No. 3 Adit Lv.

A list of the equipment needed includes, but is not limited to the following:

- 4 - 1 ton mine cars, end dump, 18" gauge
- 1 - 250 CFM compressor
- 2 - 3000 Watt light plants (one for Camp)
- 4" Airline - 500 feet - Victaulic
- 1" water line - 500 feet
- 16 pd. mine rail, 800 lineal feet (bolts and nuts, splice spikes)

Jim crow (rail bender)
Timber, 8 X 8's, 4 X 6's, 3 X 12's, wedges, etc.
Hand Tools (shovels, picks, single jacks, socket and speed wrench, pipe wrenches, nails, hammers, crow bars, etc.)
2 - 45 or 55 pd. jack hammers
2 - air legs for hammers
Drill steel for Mining
Drill steel for Long Hole drilling
200 feet Air hose
200 feet Water hose
1 - Air Receiver
2 - Water Receivers
Tamping sticks
1 - Set wrenches, sockets, open end, etc.
400 feet 1" manila rope
6 - Electric cap lamps
1 - Charger for same
6 - Hard boiled hats (safety hats)

All should be purchased except the compressor, which could be rented. All items except the mine cars, compressor, light plant, jack hammers and air legs are considered "expendable." It is estimated that approximately $50,000.- would cover purchases and rental.

It is estimated that it would require about one month to complete what is necessary and required. A labor cost for three men, a working supervisor and a camp cook would approach an expenditure of $11,000.- including compensation insurance, etc. Transportation, fuel, oil, butane, food, etc. would add about $3,000.-.

Sleeping quarters for the men would require restoration and repair of the house trailer located in the Camp area. Allowing a $1,000.- expenditure should be ample.

The writer thus estimates that $65,000.- should be made available for the pre-mining preparation work. This figure does not include an expenditure for a dozer and front end loader to be used for "cleaning" the surface pit and portal of the No. 2 Adit Lv. Such work could be coincidental with road construction from Camp to the portal of No. 3 Adit Level.

During the period of pre-mining preparation, professional work as sampling, surveying and geological mapping in the areas of concern could be started and continued, be it the writer or any other professional.

MINING:

After pre-mining preparation has been completed, ore production can be started underground on Main Vein Block M-II (No. 3 Adit Lv. to Sub Lv. (3195) and Block Inf-I above the Sub Lv. toward the surface. Simultaneous with the above working place, ore production can be started on Siliceous Blocks Ind-I and Inf-I either on the No. 2 Adit Lv. or on the surface. The decision for determining the best route

must await the "cleaning" of the "Pit" area to be able to determine the possibility of "ore passing" to No. 3 Adit Lv. through the Hot Vein Raise-chute and/or the Chute in the second or third cross-cut just west of the haulage Drift on the No. 3 Adit Lv.

The dip of the Main Vein and that of the Hot Vein, along with the "slick" smooth footwall, make ideal conditions for employing the cut-fill-draw (shrinkage) method of mining and finger raises for draw points.

It is suggested that mining be concentrated on all classes of ore - measured, indicated and inferred - above the No. 3 Adit Lv. for as long as possible to remove as much ore as can be removed because a system of raises and "ore passes" already exists. The advantage here is the initial lower cost for mining.

Ore Reserve Maps Nos. 15 through 19 can also be used as "Stope Maps", stope outlines being measured and plotted as work progresses.

At this stage, some additional equipment should be obtained. This would include, but not be limited to, the following:

1 - 45 to 55 pd. jack hammer
1 - Air leg
Spare parts for above (water tubes, side rods, ratchets, pawl springs, etc.)
1 - Double drum air slusher, cable and scraper
1 - 600 CFM Air Compressor
1 - Air receiver
1 - Water Receiver
Water line - 400 feet
2 inch Airline - 400 feet
200 feet Air hose
200 feet Water hose
2 - Mine cars, end dump, 18" gauge, ball bearing
1 - Locomotive (Mancha or equivalent) battery operated
Drill steel
Bit Grinder
Forge
Ventilation Fan
Air tubing
Timber - as for pre-mining preparation
Incidentals - powder, caps, etc.

A rough dollar estimate for purchase is $70,000.-.

MINING COST:

Mining costs can take two routes, either a high cost or a low cost. The high cost is associated with "contract" mining, the low cost associated using one's own crew.

Contract mining is treacherous because most frequently a "muck hungry"

attitude develops and soon the average grade of the ore becomes less by dilution - even with tight reins on the contractor and the miners. In recent situations, demands have been high and costly - example, a situation two months ago indicated a miner doing "dead work" on a project for my client charged $100.-/day for the miner and the contractor received $100.-/day - or $200.-/day/man to the contractor.

The writer opines that the daily rate of production - 75 to 100 tons - would not be of too great an interest to contractors.

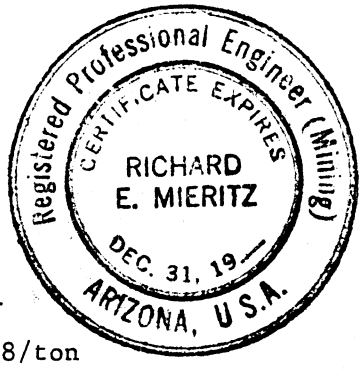
The second route utilizes one's own crew. Good miners are difficult to find, however, a situation exists in Arizona wherein Mexicans are utilized in many businesses - many "illegal aliens" or "wetbacks" are used. The writer is suggesting the use of "imported" Mexicans, legally, complete with work permits, NOT, the illegal use of "wetbacks" and breaking of the law.

Mexico has good to excellent miners and the writer opines there are many who would be interested in coming to the States. Usually, they have a better "feel" for ore than most American miners and the writer feels this is an important point - an attribute to good ore production.

In Mr. Pete Villaverde there is the "uncanny" ability of knowing "good ore" - he knows the Columbia-Silver Bell Mine - having worked for the owners some 35 years. Mr. Villaverde knows mining and its associated skilled arts. He would be an excellent Mine Supervisor.

Using a 100 ton per day production - six days a week should require the following personnel:

1 - Mine Supervisor	$ 1,700.-
2 - Miners (machine man)	2,800.-
2 - Miner helpers	2,000.-
1 - Chute man	1,000.-
1 - Trammer (locomotive operator)	1,100.-
1 - Car dumper	1,000.-
1 - Compressor man - shop man	1,100.-
1 - Camp cook	1,200.-
Total - 1 month - 2,600 tons	$11,900.-
Labor - cost/ton	4.58/ton



Professional & Semi-Professional

Professional Supervision (part time) $2,600.-		1.00/ton
Assayer - full time	$1500.-	0.58/ton

Expendables

Fuel, gasoline, oil	1.80/ton
Powder and Caps	1.00/ton
Camp Operation (Supplies, etc.)	1.50/ton
Insurance (General, Comp., S. S.)	1.25/ton
Capitalization	1.50/ton
Total Cost per ton produced	$13.21
Production rate/day/man	9 tons

A contract price is difficult to determine until "bids" are obtained, however, the writer will make an "educated guess" based on a similar situation a few months ago - underground mining, camp operation and about the same number of men.

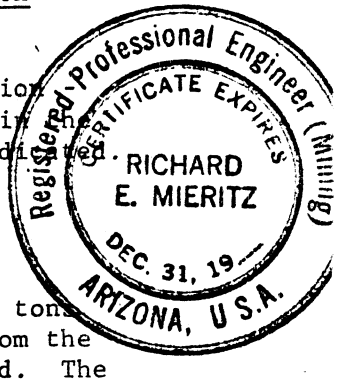
The Contractor would probably supply the equipment such as mine cars, compressor, drills, etc., on a rental basis and charge for rail, pipe, drill steel, bits, hand tools and the expendables at cost plus 20%.

The equipment cost - rental or purchase - would probably balance - thus resolving into the question of whether "capitalizing" is the route. Most of the equipment used has a "short life", therefore a relatively quick writeoff.

A contractor could conceivably charge 3 times the labor charge (example previously mentioned) for the employee and the contractor's profit. The expendables would carry a 20% higher value. Using this basis, following charges could exist:

Labor - 3 times $11,900.-		$35,700.-
Total cost per ton		13.73/ton
Professional & Semi-Professional		
Professional Supervision (part time) $2,600.-		1.00/ton
Assayer - full time	$1,500.-	0.58/ton
Expendables		
Fuel, gasoline, oil		2.16/ton
Powder and caps		1.20/ton
Camp Operation		1.80/ton
Insurance		0.50/ton
Equipment rental		1.50/ton
Total contract price per ton		$22.47

The mining cost difference is $9.26 in favor of self operation providing, of course, the writer's "contract price" is within the "ball park." For 50,000 tons, a saving of $463,000.- is indicated.



BREAK EVEN POSITION:

It has been shown that the calculated Ore Reserve of 57,000 tons containing 7.76 ounces silver is a profit making venture from the mining standpoint - either by contract crew or self operated. The writer has been advised by Mr. D. Coleman that the milling cost of $15.00 per ton will be used.

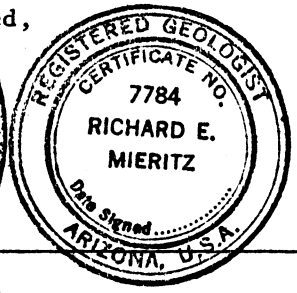
Exclusive of royalty and property purchase payments and before taxes, costs to produce silver bullion is as follows:

	Contractor	Self Operated
Mining	$22.47	$13.21
Milling	15.00	15.00
Development	2.00	2.00
Totals	$39.47	$30.21

With silver at $25.00 per ounce, a break even silver content of 1.58 ounces would be required using the Contractor route and a 1.21 ounce content would be required for the self operated route. A 90% mill recovery would increase these figures to 1.75 and 1.34 respectively.

Be reminded that the revenue from a bi-product of lead concentrate is not included in the dollar value of the ore.

Respectfully submitted,



Richard E. Mieritz
Mining Consultant
Phoenix, Arizona

February 11, 1980

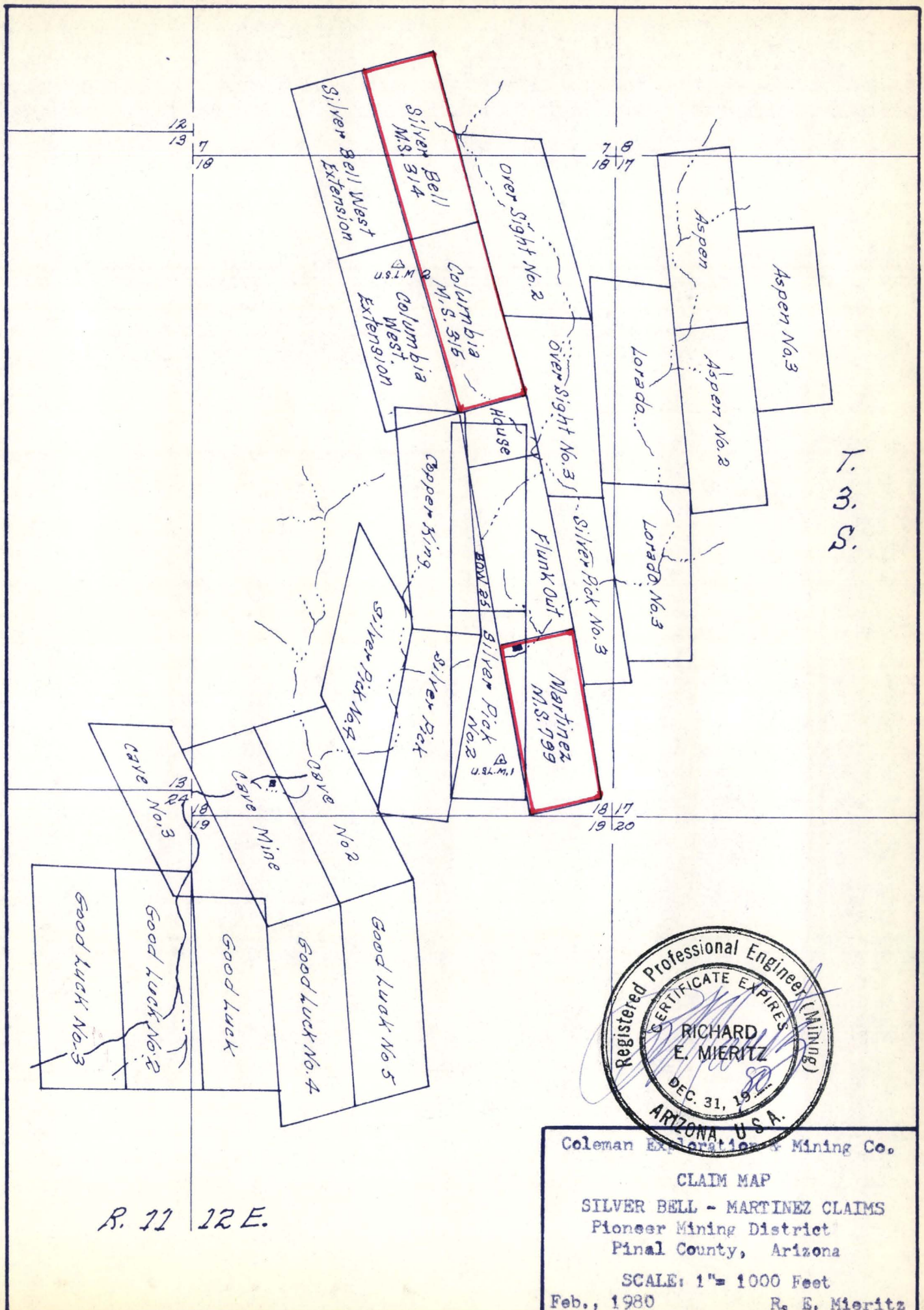
INDEX MAP
SOUTHWEST ARIZONA

SCALE: 1" = 27.5 MILES

JAN., 1962

R. E. MIERITZ, P.E. PHX, ARIZ

MAP No. 1



Registered Professional Engineer (Mining)
CERTIFICATE EXPIRES
RICHARD E. MIERITZ
DEC. 31, 19__
ARIZONA U.S.A.

Coleman Exploration & Mining Co.

CLAIM MAP

SILVER BELL - MARTINEZ CLAIMS
Pioneer Mining District
Pinal County, Arizona

SCALE: 1"= 1000 Feet

Feb., 1980 R. E. Mieritz

MAP No 2

N

Cave No. 2

Silver Pick No. 4

Silver Pick

Basalt Dike

N20°

Copper King

Columbia West Ext

U.S.M.M. 2

Silver Bell West Ext.

Silver Bell - 314

Hearit

Iron stained zone

Silver Pick No. 2

Basalt Dike

Pink Rhyolite

Qtz Phzon

70°

Honeycomb, Qtz Porhic

House

Columbia - 315

Heavy iron stained

Over Sight No. 2

Flunk Out

Pink Dike

Oolitic altered

Br. - Alt. - Ameta red

Martinez - 799

Tan Rhyolite

Silver Pick No. 3

Over Sight

Lorado

Lorado No. 3

Aspen

Aspen No. 2

Aspen No. 3

REGISTERED GEOLOGIST
CERTIFICATE NO.
7784
RICHARD E.
MIERITZ
Date Signed
ARIZONA, U.S.A.

SURFACE MAP

SILVER BELL — MARTINEZ MINE

PIONEER MINING DISTRICT

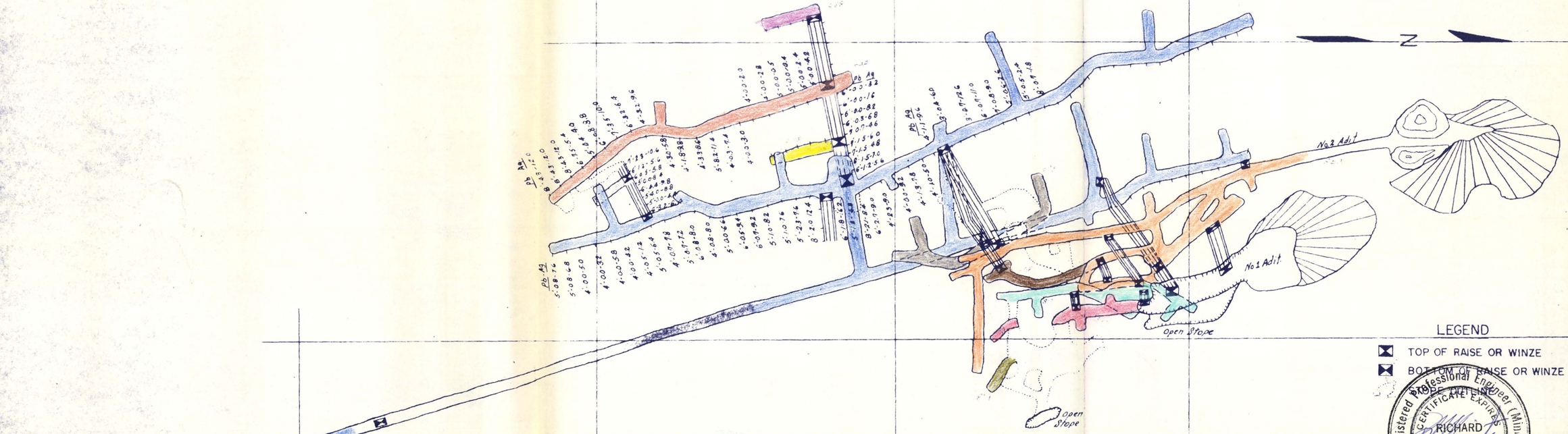
PINAL COUNTY, ARIZONA

SCALE

0 100' 200' 400' 800'

OCT, 1957 R.E.M.

PLATE: 2



LEGEND

- TOP OF RAISE OR WINZE
- BOTTOM OF RAISE OR WINZE
- STOPE OUTLINE

NOTE

BASIC DATA OF UNDERGROUND WORKINGS TRACED FROM MAP BY H.B. STARBIRD DATED MAY 25, 1920.

Registered Professional Engineer (Mining) CERTIFICATE EXPIRES DEC. 31, 19 RICHARD E. MIERITZ ARIZONA, U.S.A.

ASSAY MAP

SILVER BELL-COLUMBIA MINE

PINAL COUNTY, ARIZONA

SCALE

0 10' 20' 50' 100' 150'

OCT., 1957 R.E.M.

PLATE: 4

GEOLOGIC AND ENGINEERING

REPORT

of the

SILVER BELL-MARTINEZ MINES

in

Pioneer Mining District
(Mineral Creek Mining District)

PINAL COUNTY, ARIZONA

by

R. E. Mieritz
Mining Consultant
Phoenix, Arizona
2940 N. Casa Tomas
277-6053

October 24, 1957

COPY

TABLE OF CONTENTS

APPENDIX

INTRODUCTION

At the request of Mr. A. H. Mackenzie, Phoenix, Arizona, a field examination of the Silver Bell-Martinez lead-silver mine was made by the writer to ascertain the merit of the property which is located in the Pioneer (Mineral Creek) Mining District, Pinal County, Arizona.

This report contains the writer's unbiased evaluation of the property with particular reference to existing geological conditions, present and future potentials of the property and equipment considerations.

The surface and underground examination was completed at intervals during the early weeks of October, 1957. All available records, etc., were reviewed which included a report by Mr. H. B. Starbird, May, 1920, and much correspondence from 1943 to 1955 between Mr. T. S. O'Brien, Consulting Engineer and Mr. G. F. Bont of California Iron Products Co., Richmond, Calif.

Some of the maps herein included have wholly or in part been traced from older maps.

The writer has also made an impartial check of the early report which delimited ore reserves and grade and has also checked information as late as January, 1955.

CONCLUSIONS

The following are conclusions resulting from the examination and study of the property by the writer.

1. Neither of the two mines, the Martinez, nor the Columbia-Silver Bell, can be called immediate potential producers. The Martinez lack sufficient "indicated" or "measured" ore (3000 tons "inferred") as contrasted to the Columbia-Silver Bell which has ample reserves but of sub-marginal grade ($13.00 value per ton) at present day metal prices and production costs.

2. The future of the Martinez Mine lies in the geologic potential the mine exhibits by its existing development. A well planned exploration and sampling program must be adopted and exercised to transpose "inferred" ore to "indicated" or "measured" ore before mining operations can be considered.

3. Any "ore" from the Martinez Mine which has a combined lead-silver value in excess of $18.00 (estimated mining, milling, marketing costs including losses) will show a profit before royalty and taxes.

4. Metallurgically, the lead-silver mineralization of the Martinez mine is amendable to concentration by jigs, flotation and gravity tables.

PROPERTY

The Silver Bell-Martinez lead-silver property is currently owned by Mr. G. F. Bont, Richmond, California. Twenty seven claims, approximately 500 acres, include three patented claims.

These claims are located in Section 18, Twp. 3 S., Rge. 12 E., Gila and Salt River Base and Meridian, Pinal County, Arizona. Though no personal check was made in the County Recorder's office, the claims appear valid and clear of any liens.

Claims included in the property are as follows:

Patented Claims

Silver Bell -- Survey 314 -- April 18, 1890
Columbia -- Survey 315 -- April 18, 1890
Martinez -- Survey 799 -- January 10, 1891

Unpatented Claims

Aspen	Flunk Out	Lorado No. 3
Aspen No. 2	Good Luck	Over Sight
Aspen No. 3	Good Luck No. 2	Over Sight No. 2
Cave	Good Luck No. 3	Silver Bell West Ext.
Cave No. 2	Good Luck No. 4	Silver Pick
Cave No. 3	Good Luck No. 5	Silver Pick No. 2
Columbia West Ext.	House	Silver Pick No. 3
Copper King	Lorado	Silver Pick No. 4

The property is located approximately 20 miles northeast of Florence, Arizona. Access to the area is over 20 miles of County maintained road, 10 miles of which parallels a branch of the Southern Pacific Railroad to Price,

the railroad ore loading ramp servicing the area. The last 10 miles for the most part utilizes the bed of several washes. Unfortunately such road locations can be extremely expensive as to maintenance and particularly when destroyed by flash flood conditions.

PHYSICAL FEATURES

Rugged topographic features abound in the immediate mine vicinity. Recent erosion of the rhyolite flows create steep near-vertical pinnacles of great relief. A mean elevation for mining activity can be considered as 2,700 feet above sea level with a range of elevation from 2,400 feet down wash from the Martinez Mine to 3,450 feet up slope above the Columbia-Silver Bell Mine.

Climate-wise, the property is ideally situated to permit an uninterrupted yearly operation. The one jeopardizing act of nature that could cause damage is flash flood conditions because the wash traversing the property is the only escape for rain waters precipitated north, east and south of the property. The writer had been advised that flash flood conditions did exist in 1955 and had for the most part obliterated approximately six miles of road. Since destruction is possible by this means, precautions and preventative measures must therefore be considered for any new road alignment and construction, also for placement, installation and construction of new machinery and/or buildings.

FACILITIES

The property is too remote for any modern day utility excepting a source of water. Gas for heating and domestic purposes must be in bottled form and trucked from Florence. Electricity for mine, mill and camp operation must be developed on the property. Timber for mining and construction purposes in carload lots must be trucked from Price.

An existing well located near the camp at the wash bottom can possibly

supply the domestic requirements of a small camp. Water for mine and mill operation may have to be developed. A possible limited and unreliable ? supply might be the water from below the 200 level of the Martinez Mine. A previous operator's correspondence in 1948 indicated the shaft sump could provide 160 gpm. Another more recent source of information places the capacity at 15 gpm, continuous pumping. The latter figure is about ample to operate the present mill at its 50 ton per day capacity.

HISTORY AND PRODUCTION

The property was well known for its silver production, the majority of which had been mined from enriched, near surface, chloride zones in the Columbia-Silver Bell Mine. Production dates back to 1880. Demonetization of silver took its toll here also. The property no doubt changed ownership several times until the present owner, Mr. Bont, purchased same several years ago.

Two lessors, besides Mr. Bont, have operated the property intermittently under options to purchase. All options have been cancelled.

The writer obtained the following shipment records from the Smelting Company to which the ore and concentrates had been shipped.

Producer		Type	Tons	Ounces Silver	Percent Lead	Lead Price
Calif. Steel Prod.						
Year	1943	Ore	345	1.2	14.4-24.3	6.5¢
	1944	Ore	424	.4-19.8	8.0-26.0	6.5¢
	1945	Ore	280	.7- 4.6	11.6-20.8	6.5¢
	"	Conc.	34	1.7	54.0	6.5¢
	1946	Ore	52	1.0	20.0	8.109¢
	"	Conc.	30	2.0	53.6	8.109¢
Martinez-Bell Mining						
Year	1948	Ore	21	1.5	23.5	18.04¢
United Ariz. Mines						
Year	1951	Ore	243	2.0	19.3-34.7	17.50¢
	"	Conc.	66	2.5	42.9-58.3	17.50¢
	1952	Ore	42	2.3	27.0-37.7	16.467¢
	1952	Conc.	30	1.9- 4.1	47.7-57.3	16.467¢
	Totals	Ore	1,407	1.0-19.8	8.0-37.7	
		Conc.	160	1.7- 4.1	42.9-58.3	

The above production record is not overly impressive, but it does provide an indication of what had been shipped through hand sorting and milling of the ore.

GEOLOGY

The property is situated in an area of Tertiary Volcanic flows which have been uplifted and distorted to some extent. Rhyolite and its many phases of mineralogical composition and physical textures is the principal country rock. Into this rock there has been intruded some later rhyolite and basalt-diabase series dikes. These dikes could have influenced the metallic mineralization.

Since metallic mineralization is associated with fractures and zones rather than with rock types or phases, no attempt has been made by the writer to differentiate the rhyolite phases. Surface mapping in the area was completed in a general way using physical characteristics such as erosional features, color, texture, etc., as a criteria for classification and separation. Obvious rock types as dikes were mapped as observed.

MINERALIZATION

Metallic mineralization, lead, silver, some copper and a small amount of zinc occurs as lenses within wide parallel zones of weakness in the rhyolite series. These zones are identified on the surface by the greater amount of iron oxide and quartz present in the zone as contrasted to the lesser degree in content in the various rhyolite phases.

The general trend of the zones of weakness is north-south and their dip is westerly at a moderate angle. Local strike and dip changes vary from N. 15 W. to N. 15 E. and 35 to 60 W. These changes apparently control "pay" mineral deposition. This criteria must be further studied and used in development of future ore reserves.

Lead and silver mineralization at both mines (Martinez and Columbia Silver Bell) is contained in the minerals galena, a sulphide; cerrusite, a carbonate; anglesite, a sulphate; pyromorphite, a chloride; phosphate; and the silver mineral cerargyrite.

Lead mineral distribution is somewhat sporadic, being moderately localized in areas of sufficient dimensions to spearhead and justify exploitation as stopes. The mineralization also shows a greater vertical tendency than horizontally, the control of which may be the changes or rolling of strike and dip directions combined with the cross-fracturing observed during the examination.

Copper mineralization as oxides and sulphides were observed in the south drift of the Martinez 200 level. The appearance of copper here may well be significant as to possibilities of same at depth. Lack of adequate information will not permit a definite conclusion.

Gangue minerals include quartz, iron oxide, fluorite and minor barite. Fluorite is more prominent in the lower level.

DEVELOPMENT

Two mines have been developed on the property. The Columbia-Silver Bell Mine is primarily a high silver-low lead ratio ore on the order of 6 to 1 with the lead seldom exceeding 2%. The combined monetary value of the reserve blocked out by Mr. Starbird would not exceed $13.00 in place and therefore cannot be considered as "ore" since it cannot be mined, milled, and marketed for a profit on a scale which we are concerned with.

The Martinez Mine on the other hand has a high lead-low silver ratio of approximately 6 or better to 1. The monetary value of this ore at present day metal prices is approximately $20.00 in place. The ore reserves of the mine are, however, quite limited.

UNDERGROUND DEVELOPMENT OF EACH MINE

The Columbia-Silver Bell Mine is developed by various adit levels, interior shafts, winzes and drifts over a 500-foot strike length and a vertical depth of 300 feet measured from the discovery in the saddle through which this zone passes. High grade silver ore has been mined above the No. 3 Adit level (see Plate 4). Apparently some enrichment occurred in the two veins within the zone, the footwall and hanging wall. The two veins became one at a short distance above the No. 3 Adit Level. Below this junction the silver values remained but in amounts which will not satisfy dollar-wise the present day costs involved to mine and mill the material.

The writer did not enter the mine to examine same. Records indicate this mine has not been worked since 1920, and that the workings as shown in Mr. Starbird's report (Plate 4) are essentially correct. From 1943 to 1946, Mr. T. S. O'Brien obtained some ore for metallurgical tests. It would therefore appear that many of the workings should be accessible.

The Martinez Mine, which we are more concerned with, was entered and most of the underground workings examined, but not mapped geologically because of the time factor. This mine is developed approximately 900 feet along the strike and to a depth of 200 feet by an inclined shaft, an adit level and three intermediate levels including the long 200 level. (See Plate 3)

A moderate lead-silver tonnage has been mined from four stopes above the 200 level. The previous mentioned production record indicates the tenor of hand sorted crude ore and the milled concentrates marketed by the operators.

ORE RESERVES

Columbia-Silver Bell

Starbird, in his 1920 report, calculated approximately 60,000 tons of measured and indicated ore available using the existing development at limits.

This tonnage has been substantiated by the writer. The writer also weighted the grade of each block of ore and obtained an average grade of 8.3 ounces of silver and 1.4% of lead. The unfortunate circumstance, however, is the fact that mining, trucking, milling and marketing costs will equal or exceed the monetary value of the ore after a 10% mill loss and a 5% smelter deduction of current metal prices.

In a letter dated August 19, 1946, Mr. T. S. O'Brien indicated that some 1600 tons were mined from various parts of the old workings and shipped to the smelter. The average grade of this material was 7.5% lead and 18 ounces of silver. Plate 4 of this report does not indicate that ore of this tenor is available any place in the mine. The wide variation, therefore, infers two thoughts: (1) that the ore obtained was to some degree hand sorted and (2) that the sampling completed by Mr. Starbird was unreliable and not representative of the material. The writer is of the opinion the sampling is within the realm of its own right for reason of the consistent distribution of the lead and silver values from sample to sample and level to level. A check sampling program on a limited basis would be very helpful.

We must therefore assume that the tonnage of concern was removed from higher grade areas and hand sorted.

Martinez

The measured and indicated ore reserves of the Martinez Mine as delimited by existing workings are quite meager at this writing. Lack of adequate sampling, lack of correct and up-to-date maps and the limited field examination time, requires the author's ore calculations be classified as inferred.

Much mining has been done since Mr. Starbird sampled and calculated a 6000 ton reserve of 8.8% lead and 2.5 ounces of silver. Additional development indicated other ore shoots which since have been mined also.

Five ore blocks have been indicated on Plate 3, Blocks "A" to "E". The dimensions used and tonnage of each block is given below:

Block "A"	30'L x 60'H x 4'T equals	620 tons
Block "B"	70'L x 20'H x 4'T equals	480 tons
Block "C"	50'L x 55'H x 4'T equals	940 tons
Block "D"	50'L x 30'H x 4'T equals	510 tons
Block "E"	50'L x 30'H x 4'T equals	510 tons
Total "Inferred" Ore		3,060 tons

NOTE: "L" is length along strike of zone; "H" is height on slope of zone; "T" is thickness or width of zone.

A cubic foot factor of 11.6 was used, or a factor of .345 times the length and height. The assumed average grade of this tonnage is 8% lead and 2 ounces of silver.

Approximately 800 tons of ore exists as pillars on both sides of the Martinez Shaft; however, the writer cannot justify the robbing of these pillars for the sake of the small tonnage involved. The shaft in place and in good condition has more value to an operation than the monetary value which would be received from the extraction of the ore.

EXPLORATION

There is not sufficient ore available in the Martinez Mine at this time to justify a mill operation for any great length of time. Monies must therefore be expended in exploration and development of additional reserves to assure a feed to the 50-ton capacity mill for at least a year ahead of itself. The future of this mine and the justification for purchase lies in it ability to provide adequate additional reserves laterally, vertically in depth below the present bottom level and horizontally in breadth along the strike and normal to it.

A well-planned, professionally supervised surface and underground drilling program is a prerequisite to any decision to purchase. This program

must be designed to test the known ore shoots at depths below the bottom level and to test the horizontal breadth of the zone to intercept hidden paralleling footwall mineralization. Some twenty to forty thousand tons might be developed by this work.

A prerequisite to the drilling program is a detailed surface and underground survey, underground geological mapping and sampling program. The writer found many discrepancies while reviewing early data and compositing the Martinez underground map in this report from early maps.

EQUIPMENT

To say the least, the property is well equipped with the necessary tools and machinery to start operations in a very short period of time. Some renovation and cleaning of machinery and tools would be required since little to any item has been used for several years.

The present owner can no doubt provide an inventory and to duplicate same in this report would be without point except to evaluate same. All tools, equipment, machinery and buildings on the ground represents, in the writer's opinion, an expenditure of approximately $100,000. To purchase these items on the used market, excepting buildings and installation, something like $40,000 might be required.

The mine is equipped with electric hoist, cable, skip, cars, drilling machines, sump pump, rail, etc. The mill and power house are equipped as shown in Plate No. 5.

Such necessary but unusual items on the ground include laboratory sample pulverizer, pulp balance, gold-silver balance, acetylene hoses, nozzles and tips.

Office, bunk house and superintendent's house are well equipped with bunks, tables, desks, chairs, gas refrigerator, stoves, cooking utensils, etc.

METALLURGY

The ore tenor of both mines is such that the success of the property lies in the amendability of the ore to concentration. Mr. T. S. O'Brien conducted many metallurgical tests on both the Martinez and Columbia-Silver Bell ores. Subsequent lessors took advantage of the findings and the last operator used the mill flow sheet as indicated on Plate No. 5.

Concentrates from the present circuit were obtained as three products, two from the tables and one from the float section. The present flow sheet is somewhat congested by the multiple handling of the material in closed circuits between the classification, float and table circuits. Although recoveries may have been 85 to 90% with this flow, the writer believes much improvement can be made by eliminating the inefficient material handling without materially reducing the recovery factor.

In October, 1947, Denver Equipment Company of Denver, Colorado, completed a mill test on the Martinez ore at the request of Martinez-Bell Mining Company, Superior, Arizona. The resulting flow sheet, Plate 6, was recommended. The sample tested contained the following percentage of elements:

Gold	0.01 oz.	Silver	0.69 oz.
Total Lead	10.40%	Iron	4.20%
Oxide Lead	5.25%	Sulphur	0.33%
Zinc	0.65%	Insoluble	68.12%
Copper	0.12%		

Calculated head assay was: Total Lead - 9.58%; Oxide Lead - 4.90%. Five tests were completed, four using flotation and gravity tabling while the other used jigs, flotation and gravity tables. Lead recoveries ranged from 59% to 87% for concentrates which contained 36% to 62% lead. The carbonate, sulphate and, in particular, the chloride-phosphate of lead presented the greatest problem for recovery.

The two most successful and accepted tests had the following results using the identified methods of recovery:

	% Lead Recovered	Grade % Lead	Concentration Ratio
Jigs	45.05	50.9	12.2 to 1
Flotation	27.54	52.3	20.4 to 1.
Tables	11.33	38.0	36.2 to 1
TOTAL	83.92	49.6	6.25 to 1

100 tons ore would produce 16 tons concentrate of 49.6% lead. Concentration ratio of 6.25 to 1.

Flotation	63.99	46.2	7.5 to 1
Table	22.81	45.8	20.9 to 1
	86.80	46.1	5.55 to 1

100 tons ore would produce 18 tons concentrate of 46.1% lead. Concentration ratio of 5.55 to 1.

Denver Equipment recommended the flow sheet employing jigs, flotation and table concentration even though the recovery was 3% lower. Their recommendation was based on the production of a better product, simplicity in design and without much recircuiting along with a slightly higher concentration ratio which in effect provides a substantial saving in rail freight to the smelter.

ESTIMATED EXPENDITURES

The following is an estimated itemized schedule of expenditures necessary to accomplish the individual phases required to properly initiate and execute an operation of the property. These initial expenditures, solely related to the Martinez Mine, do not include purchase of tools, supplies, etc., unless so mentioned in the item.

Access Road

Approximately six miles of access road must be re-aligned and rebuilt to eliminate as much erosion damage as possible caused by the intermittent cloudbursts common to the area. The necessity of this much reconstruction is laid to the fact that concentrates would be trucked over the road and any improvement made now will effect a saving in hauling expense.

Drilling

Since a relatively small reserve, based on present development, exists in the Martinez Mine, the future of any operation is dependent on what additional ore reserves can be developed above and below the bottom level of the mine. Mineralization, mill grade rock of about $20.00 value, tends toward rectangular shaped lenses, the vertical length of which is greater than the horizontal dimension. A year's reserve should always be maintained in advance of mining operations. An exploration program is therefore a requirement which must be considered. A minimum program would include surface drilling and underground sampling. A later program of underground drilling would also be advised only, however, after a mining operation was considered. The necessary expense involved in a mine "cleanup" operation could not be justified for the small amount of short hole drilling that would be recommended.

A minimum surface drilling program should consist of six to eight holes totaling approximately 1,500 feet. The 200 level should be adequately sampled as well as the stope and walls where accessible.

Mining

Much rehabilitation and "cleanup" will be required to make the mine safe and provide for efficient operation. A general cleanup must be made, rotton timber replaced, rail laid in shaft, air and water lines installed, vent lines provided, electrical equipment checked along with any other equipment which will be required in mine operation.

Milling

A general mill "cleanup" will be required along with a general equipment check. The writer can only provide but a rough estimate for such items as "cleanup" and equipment repairs. Other expenditures can be reasonably estimated.

Access Roads		
Rehabilitate and align 6 miles of 12-foot wide road with turn outs. (Blasting required; Cat, compressor rental, 1 mo.)		$ 5,000.00
Exploration		
Mine Survey, Geol. Mapping, Drill, Supervision, Logging, Exp.		1,750.00
Water Supply, Check Electrical Equipment for Shaft Pump		100.00
Drilling: 1,500 feet @ $5.00/ft.		7,500.00
20% for Extras, Cementing, etc.		1,500.00
Sampling and Assaying: 10¢/ft.		150.00
	Total	$ 11,000.00
Mining		
Mine Cleanup: 800 ft. @ $1.75/ft.		$ 1,400.00
Timber		300.00
Equipment Check & Repair, Labor & Parts		500.00
Installation of Shaft Rails, etc.		200.00
	Total	$ 2,400.00
Milling		
Mill Cleanup and Rehabilitation		$ 300.00
Equipment Check and Repair		800.00
	Total	$ 1,100.00

RECAPITULATION

		Total
Access Roads	$ 5,000.00	$ 5,000.00
Exploration	11,000.00	16,000.00
Mining	2,400.00	18,400.00
Milling	1,100.00	19,500.00

ESTIMATED OUTCOME

The estimated outcome can best be projected on a one ton crude ore basis. Certain provisions must be assumed such as average grade, mill recovery and mill capacity. For convenience, the writer will assume an average mill feed comparable to the sample tested by Denver Equipment. The calculated head of this sample was 9.29% lead and 0.75 ounces of silver. The mill recoveries assumed are those obtained by Denver Equipment in their recommended flow sheet and the mill capacity is assumed as 50 tons per 24 hour operation.

A smelter schedule by American Smelting and Refining Company stipulates the following charges and credits:

Payments

Silver: "Pay 95% at average silver quotation for calendar week less 1½¢ per ounce. Minimum deduction one troy ounce."

Lead: "Deduct 1.5 units of wet assay and pay 90% or remaining at New York common quotation less a deduction of 2.2¢ per pound."

Deductions

Base Charge - Concentrates $13.50/ton
Credit - 10¢ per unit per ton over 30% Lead
Charge - 10¢ per unit per ton under 30% Lead

Value of Concentrate

Lead -	48.7% - 1.5% equals 47.2% x 20 lbs. equals 944 lbs. x (14.0¢ - 2.2¢) equals	$ 111.39
Lead Credit -	17.2 units x 10¢ equals	1.72
Silver -	2 ounces x 95% - Min. deduct 1 ounce x (90.6¢ - 1.5¢) equals	.89
		$ 114.00
	Concentration Ratio: 6.25 to 1	
	Value per Ton of Crude Ore	$ 18.24

ESTIMATED PRODUCTION COSTS

The following production costs are based on providing the 50-ton capacity mill with its daily requirement for a seven-day-per-week operation. Mining has been assumed on a six-day-per-week basis with a production of 60 tons per day or 360 tons per week.

Mining -- 360 Tons Per Week, 6 Day Operation

1 Hoistman @ $20.00 per Day		$ 130.00
3 Miners @ $18.00 per day		351.00
1 Miner's Helper @ $16.00 per day		104.00
3 Trammers @ $16.00 per day		312.00
1 Comp/mill man, ½ Time @ $20.00		65.00
1 Mine/Mill Foreman @ $600.00/mo.		75.00
	Total	$ 1,037.00
14% Insurance, etc.		145.18
Professional Services		50.00
	Total Labor	$ 1,232.18
Supplies, Powder, Rail, Timber, Diesel Oil, Gasoline, Oil		700.00
	Total Mining 360 Tons	$ 1,932.18
Initial Capital Exp. 2% of $18,400.00		368.00
		$ 2,300.18
	Mining Cost Per Ton Crude Ore	$ 6.39

Milling

1 Mine/Mill Foreman @ $600.00/mo.		$ 75.00
3 Mill Men @ $20.00 per day		390.00
1 Trammer @ $16.00 per day		104.00
1 Comp./Mill Man ½ Time @ $20.00		65.00
	Total	$ 634.00
14% Insurance, etc.		88.76
Professional Services		50.00
	Total Labor	$ 772.76
Supplies, Reagents, Gasoline, Diesel oil, oil, etc.		$ 550.00
Initial Capital Exp. 2% $1,100.00		22.00
Additional Equipment, Repairs		180.00
	Total Milling 360 Tons	$ 1,524.76
Milling Cost per Ton Crude Ore		$ 4.24

Trucking to Price, Arizona

1 Truck Driver @ $16.00 per day		$ 104.00
14% Insurance, etc.		14.56
	Total Labor	$ 114.56
Truck Operation and Repair		125.00
	Total Trucking Charge	$ 239.56
Trucking Charge per Ton Crude Ore		$ 0.67

Rail Freight to El Paso, Texas

Freight Rate for Concentrates Between $100.00 and $125.00 is $11.59 plus tax of 3% which brings the total to $11.94. With a 6.25 to 1 ratio, cost per ton of Crude Ore is $1.91.

Smelter Charge

Base rate of one ton of concentrate is $13.50 and with a 6.25 to 1 ratio, cost per ton of Crude Ore is $2.16.

Recapitulation

Mining	$ 6.39
Milling	4.24
Trucking	0.67
Freight	1.91
Smelting	2.16
Total Production Cost	$ 15.37
Value of assumed ore (After Conc.)	$ 18.24
Production Costs	15.37
Profit per Ton of Crude Ore Before Royalty and Taxes	$ 2.87

A 1% lead decrease in the mill feed will reduce the margin of profit by $2.36 per ton and will therefore be about the breaking point between a profit and a non-profit operation. The minimum mill feed must not be lower than 8% lead and 1 ounce of silver. Similarly, any increase in grade above the 9.2% lead content will add that much to the profit figure.

RECOMMENDATIONS

The writer, having completed a brief field examination and an office study of the property and circumstances, can recommend the following:

1. That the property be optioned for no money down and with an exploration period grant of four months but not more than six months.
2. That an estimated expenditure of some $13,000 be made for limited access road repair, mine survey and geological mapping, surface drilling and an underground sampling program.
3. Contingent on the results of Recommendation No. 2, the option be continued or cancelled as the case may be.
4. If results of Recommendation No. 2 are favorable, continue access road rehabilitation and initiate mining and milling operations, milling operations as herein described.
5. That the amendability and economics of the copper and fluorite mineralization should be determined as possible by-products in the milling schedule. These minerals could provide extra revenue at a minimum of expense.

Respectfully submitted,

R. E. Mieritz, P. E.
Mining Consultant
Phoenix, Arizona

October 24, 1957

AERO GEOLOGY & ENGINEERING SERVICES

810 East Colter Street — Phoenix, Arizona

October 30, 1962

B. O. W. Mining Co.
5550 East Washington Street
Phoenix, Arizona

Attention: Mr. J. W. Wingfield

Gentlemen:

At the request of Mr. Wingfield, the following has been prepared to summarize the work you have accomplished to date on the Silver Bell-Columbia-Martinez lead-silver property in Pinal County and what the possible geologic potential exists at this stage.

As you will recall from our early conversations, I had indicated to you that the particular property could, with proper professional guidance and the expenditure of funds on the necessary required "dead work" and on an exploration and development phase, provide sufficient "indicated" ore to begin a producing operation. Moreover, I indicated then also that much ore could be developed which could support an operation for many years.

The work accomplished to date has been in the category of "dead work" and "preparatory work" and consists of dewatering the lower level of the Martinez Mine, sinking a new shaft to the lower level of the Martinez Mine, reconstruction of the mill and installation of new mill equipment, geologic mapping of the Martinez Mine, surveying of the workings, sampling, and diamond drilling.

The revamping of the mill and the installation of the present mill equipment has taken much time, principally because of the experimental use of the new "one-stage" reduction crusher; however, the limited time the mill had operated on trial runs, we have indicated that a concentrate can be made containing 55% to 62% lead. Concentration is completely by gravity means. A few more trial runs will indicate the concentration ratio as well as the recovery percentage.

The new shaft, termed the Bow Shaft, was sunk on the north side of Martinez wash to facilitate ore handling from the lower Martinez level and to provide natural ventilation in this portion of the mine. The Bow Shaft has been sunk on an undeveloped vein parallel to the Martinez vein, thus opening up additional ore potentials.

When the south drift from the Bow Shaft to the northern face of the Martinez lower level is complete, we will then have access to possibly five ore shoots, four on this vein and one on the Martinez vein. Until these ore shoots become accessible, mining of the two ore shoots indicated on the 60 Level of the Martinez vein to the north would provide the mill with ore.

The Bow vein (Bow Shaft) as well as the Martinez vein have an indeterminable strike length which is potential ground for ore shoots.

The Silver Bell-Columbia vein, approximately 3,000 feet north of the Bow Shaft, is a high silver, low lead vein which has not been studied to any great length at this moment, but definitely is a must. Here, too, this vein has an indeterminable strike length to the south, although I suspect its presence crossing the Martinez wash some 3,500 feet south of the present Silver Bell-Columbia workings. Two other parallel mineralized zones between the Martinez and Silver Bell veins exist which must also be investigated. All of these veins have a great potential.

The drill hole is of triple significance, namely to determine the thickness of the Rhyolite, two, possibly penetrate the Bow and Martinez veins some 300 feet lower than the lowest level and third, to penetrate the Rhyolite to determine the probable presence of copper mineralization.

To proceed in an orderly fashion, that is, maintaining an adequate supply of ore ahead of milling operations, much geologic mapping must be done as well as much exploration principally by underground methods must be done. Meanwhile, of course, the mill can operate using the ore indicated by the work completed thus far.

The underground map has been brought up to date with respect of the work completed, as well as the limited sampling.

Sincerely,

R. E. Mieritz, P.E.
Consulting Mining Engineer
Phoenix, Arizona

REPORT

on

SILVER BELL & MARTINEZ MINES

Florence, Arizona,

by

GLENVILLE A. COLLINS,

Mining Engineer,

1305 Balfour
Building

San Francisco, California.

August, 1934

LOCATION

The Silver Bell and Martinez Mines are located together in Township 5 S. Range 12 E. in Section 18, about 15 miles northeast of Florence, Arizona, and about 6 miles north of Cochran Station on the Hayden Branch of the Southern Pacific Railroad.

The property is at an elevation of 2500 to 3500 above sea level.

TRANSPORTATION

The property is reached at present by a road from Price Station on the Southern Pacific Railway 8 miles distant. An old road to Cochran Station could be re-conditioned and would shorten the route to five miles. Cochran Station is about 5 miles east of Price Station.

The Diversion Dam of the Coolidge Irrigation Project is near Price and affords a means of crossing the river on the apron of the dam to the Florence highway which is on the south side of the Gila River while the railroad at Price is on the north side.

The road to Florence is a first class highway suitable for heavy hauling and is 11 miles from the Diversion Dam.

CLIMATE

The climate is typical of southern Arizna and is very dry and such that the property can be worked all year around.

OTHER MINES

About 8 or 9 miles to the East is located the Ray Consolidated whose dividend record exceeds fifty million dollars. This mine operates the Hayden Smelter about 23 miles East of the Silver Bell.

The Magma Mine is located about 7 miles north at Superior. This property operates its own smelter and has paid over eight millions in dividends. Both these smelters now accept custom ores.

The country and geological conditions are very similar or identical. The Magma is a high grade copper property with ores ranging from 2½% to 10% copper. In its early development the upper workings carried lead-silver ores principally. The Magma has several shafts to the 2800 foot level and has enormous reserve tonnage in a vein averaging about 30 feet wide and the ore shoots are several thousand feet long. The Belmont Mine lying between the Magma and Ray is just over the range from the Silver Bell.

The Miami and Inspiration with their smelter is still further to the Northeast.

The Silver Bell is in the heart of the great copper district of Central Arizona

WATER

The property has a splendid spring for camp requirements. In the Martinez shaft the water level stands at 300' below the color and makes enough water to operate a 100 ton mill. As the shaft is deepened probably a greater flow of water can be expected. The Gila River, five miles distant, has a continuous and substantial flow.

HISTORY OF THE PROPERTY

The Silver Bell was discovered in the early seventies and operated as a silver mine. It had a charcoal smelter on the Gila River, five miles south. Reports by Dr. Tibbets state that over 104 carloads of bullion were shipped out by burros to Casa Grande 60 miles away which at that time was the nearest railroad point.

The property was principally operated by lessors who have done

much development work in the veins while hunting for "high grade". The rich streaks of silver ore often assayed 2,000 to 3,000 ozs. per ton. Some of these rich kidneys no doubt remain to be found. Several stringers now in evidence carry high assays and may lead to the larger pockets such as were found in the early days.

Some reports by old residents of Florence state that over $1,000,000.00 has been produced by the property. Records of over $350,000 are reported but much of the early production by lessors is not recorded.

DESCRIPTION - SILVER BELL

The property consists of 27 claims of which the Columbia, Silver Bell and Martinez claims are patented.

The Columbia and Silver Bell claims are on the vein bearing the same name and at a surface elevation of 3300 feet. This vein is about 20 to 30 feet wide and dips about 45° to the west.

There is 4330 feet of development on this vein and extends to the 5th level or 300 feet vertical depth. All the work serves to develop the vein and there is virtually no lost or misplaced effort. All workings are open and accessible and little timbering required.

The drifts occupy only a portion of the vein and little cross cutting has been done but where cuts have been run the vein is 20 feet or more in width and carries lead carbonate ores the full width.

There are about 12,000 tons of ore of milling grade on the Silver Bell dumps.

MARTINEZ

The Martinez vein is parallel to the Silver Bell and about 800' south with about the same dip of 45°. The elevation of the adit is about 2700 feet.

The Martinez is opened by an adit on the vein about 50 feet below the surface at the point where the incline shaft has been sunk.

The shaft is down to the 300 foot level, just below which the water level stands.

The vein is about 20 feet wide and the ore shown in the drifts carries considerable galena along with the carbonates. On the 300' level the amount of galena sulphides increases and copper carbonates are showing up with an average of 2% or better in copper along the lower level for about 500 feet.

Almost the entire ground between the 300 foot level and the adit will mill for its lead-silver values.

This vein shows great strength and persistent mineralization. The limits of the ore shoot are not determined either north or south of the shaft but appear to be in excess of 500 feet.

The Martinez dump is composed of ore assaying about 8% lead and 2 or 3 ozs. silver and contains approximately 10,000 tons.

GEOLOGY AND VEINS

The rock formation of the district is eruptive. The country rock is Rhyolite showing well defined fracture planes parallel with the strike of the Silver Bell vein. Some cross faulting with short throws is in evidence.

The veins show enormous strength often swelling out to 100 feet in width and standing above ground for 10 to 20 feet.

The fissuring is consistent and easily traced. The foot wall of the Silver Bell vein is strikingly true and smooth and the same applies to the hanging wall of the Martinez.

Both veins strike N. 16° W. and dip 40° to 45° E. The walls

show splendid slickensides.

There are six other veins of similar description on the other claims of the group but are not developed to any great extent.

ORE RESERVES

In 1930 the mines were sampled every ten feet throughout the entire workings. Each sample location is marked by a tin tag and the assays and width of the sample are on record. This work was done by Mr. H. B. Starbird, E. M. of Los Angeles. His assay map is appended hereto and his assays are listed following:

The total tonnage of the Silver Bell and Columbia as a recapitulation of Starbird's work is as follows:

COLUMBIA AND SILVER BELL
ORE IN SIGHT

BLOCK	TONS	AG.Ozs.		PB.%	
A	1,224	13.0	15912.0	2.7	
B	720	8.5	6120.0	2.2	
C	3,018	13.1	39535.8	2.6	
D	2,034	7.2	14572.8	0.5	
E	1,000	12.5	12500.0	3.0	
F	2,220	9.2	20424.0	0.4	
G	2,500	10.8	27,000.0	2.2	
H	2,002	13.0	26,806.0	2.5	
I	7,372	8.2	60,450.4	0.7	
J	17,955	7.7	138,253.5	1.0	
K	11,036	7.4	81,566.4	1.5	
L	3,618	6.1	22,069.8	2.6	
M	665	9.0	5,985.0	1.4	
N	3,573	8.0	28584.0	1.1	
	58,607		498,411.7 = 8.48		

Average silver value-8.55 oz. per ton @ 64¢ per oz.
on 501,606 ozs. $369,427

Average lead value-1.75% @ 4¢ per lb. on 2,058,245 lbs. 82,330

DUMPS

1.	2,000	24.6	5.5	
2.	2,000	15.5	3.3	
3.	83	30.4	1.8	
3.	6,000	11.0	4.0	
3.	150	7.2	2.8	
3.	2,500	5.6	0.7	
	12,833	Average silver value 15.4 ozs. @ 64¢		183,560
		Average lead 3.01% 04¢ per lb. 754,667 lbs.		30,186

Fwd. 58,807

Total ore in sight 71,343 tons

Total gross value Ore in sight $595,503

Ore in sight is taken having two, three, and four sides exposed and sampled every ten feet. Where two sides were used the distances were very close. Ores in sight are calculated only from width sampled.

COLUMBIA AND SILVER BELL

PROBABLE ORE

BLOCK	TONS	AS Ozs.	
H	4,124	13.0 53,612.0	2.5
I 29%	2,137	8.2 17,523.4	0.7
J 50%	8,977	7.7 69,122.9	1.0
L 100%	3,618	7.4 26,773.2	2.6
N 100%	3,373	8.0 26,984.0	1.1
Total	22,229 tons	194,015.5 = 8.73	

Average silver value 8.86 oz. per ton @ 64¢ per oz. 196,040 ozs. $126,040

Average lead value 1.6% @ 4¢ per lb. 711,328 lbs. 28,453

$154,500

POSSIBLE ORE

K 20 ft.	40,000	13.6 544,000.0	1.0
L 20 ft.	13,000	6.4 83,200.0	2.0
O 100%	2,500	10.8 27,000.0	2.2
N 100%	2,032	15.0 26,806.0	2.5
100% of ore in sight	58,807	681,006.0 = 11.83	
100% of probable ore	22,229	9.55 Av. Ag.	1.75
Total	138,568	8.00 Av. Ag.	1.6
		1373433.2 = 9.91	

Average silver value 9.8 oz. per ton on 1,358,260 oz. @ 64¢ per oz. 869,286

Average lead value 1.75% on 4,850,980 @ 4¢ per lb. 194,037

2065860.4 $1,063,323

Probable Ores are taken as those to be found for a limited extent beyond the ore in sight when sampled every ten feet on one side.

Possible Ores are taken as those beside the ore in sight definitely blocked and sampled every ten feet but taken to the full width of the vein.

58800
62200
12 | 81 | 1000 | 67,600 —
72
91
84
70
64600
12 | 74,000
72
20
80
72

× 7
60,600. —
50,000

SUMMARY OF ORES

COLUMBIA AND SILVER BELL

	TONNAGE	SILVER VALUE	LEAD VALUE
Ore in sight	58,807	$359,427	[illegible]
On Dumps	12,636	128,654	30,186
Probable Ore	22,929	126,040	[illegible]
Possible Ore	133,698	869,286	194,067
Total	238,170	$1,475,807	[illegible]

TOTAL of silver and lead (gross) $1,913,813

MARTINEZ
ORE IN SIGHT

BLOCK	TONS	AG.Ozs.	PB.%
A	640	.7	5.0
B	3,647	2.4	6.2
C	320	1.7	9.0
D	895	5.2	9.8
E	491	3.3	7.5
	6,053		

Average silver value 2.26 ozs. per ton, 13,747 ozs. 64¢ 8,798

Average lead value 9.9% on 1,204,624 lbs. 64¢ per lb. 48,180
[illegible]

DUMPS

Sorted	20	4.6	19.5
Shaft	150	1.6	6.8
Adit	740	2.6	9.7
	910		

Average silver value 2.93 ozs. per ton, 2,666 ozs. 64¢ 1,706

Average lead value 12% on 218,400 lbs. 64¢ per lb. 8,736
$10,442

MARTINEZ
PROBABLE ORE

BLOCK	TONS	AG.Ozs.	PB.%
C	600	1.0	0.0
D	900	3.2	9.8
E	1,356	3.5	9.5
Total ore	3,056		

Average silver value 2.75 ozs. per ton, 8,429 ozs. 64¢ 5,395

Average lead value 9.4% on 576,220 64¢ 23,048
[illegible]

PROBABLE ORE: Since the examination of H. B. Starbird the Martinez has had considerable work done on the 300' level and much ore added to the dump and there should be added to Starbird's estimate 25,000 tons of ore assaying better than 6% lead and 3 oz. silver.

Silver value	$ 48,000
Lead value on 3,000,000 lbs. @ 4¢	120,000
	$168,000

SUMMARY OF ORES

MARTINEZ

	TONNAGE	SILVER VALUE	LEAD VALUE
Ore in sight	5,085	8,790	48,135
Dumps	910	1,706	6,736
Probable ore	3,065	5,385	23,048
Off 300' level	25,000	48,000	120,000
Total ore	$34,058	$63,899	$199,964

TOTAL Lead and Silver values $263,863

SUMMARY OF ORES

COLUMBIA SILVER BELL AND MARTINEZ

Columbia Silver Bell	232,170	$1,478,307	$335,006
Martinez	34,058	63,899	199,964
	266,228	$1,542,206	$534,970

TOTAL Lead and Silver values $2,077,176

The above sampling and assaying did not take into consideration gold values which occur from $1.00 to $3.00 per ton.

Also there are noticeable tungsten values present in the Martinez. These have not been assayed for tonnage purposes but without doubt a valuable recovery could be made for tungsten and possibly vanadium which is also present in un-determined amounts. Copper as carbonates occure on the lower level of the Martinez often assaying 2% or 3% copper and as the water level is reached these should increase materially. It can be definitely expected that the tonnages outlined above will carry values in excess of

the lead and silver noted. The tonnage estimates do not take in extensions in depth nor longer ore shoots. In no case have the limits of the ore shoots been determined.

MILLING

Several mill tests have been conducted and good recoveries made by selective flotation on the carbonate ores as well as the sulphides. For detailed information see [illegible].

For practical application in a small mill I believe that estimates should be based on a silver recovery of 85% and a lead recovery of 90%. The tests showed better recoveries but with a pilot mill lacking refinements some losses would occur especially with the silver slimes.

On the COLUMBIA SILVER BELL ORES IN SIGHT

85% recovery of 10.67 oz. average silver content of proven ores. 8.98 ozs. @ 64¢. $5.75 per ton

90% of lead values averaging 1.98% for proven ores = 40 lbs. per ton @ 4¢ = $1.60 per ton

$7.35

Total net recovery per ton gold, zinc, copper, tungsten values yet to be added.

On the MARTINEZ ORES IN SIGHT

85% recovery of 2.35 average silver content of proven ores. 2.0 ozs. @ 64¢ = $1.28 per ton

90% of lead values averaging 10.1% for proven ores = 202 lbs. per ton @ 4¢ 8.08 per ton

TOTAL net recovery per ton $9.36

Gold, zinc, copper, tungsten values yet to be added.

COSTS

AT COLUMBIA SILVER BELL

Mining, per ton $1.00

Milling (per ton)	$1.00
Haulage	.50
Concentrates (hauling)	.80
Smelting	.40
Freight	.50
Overhead	.40
TOTAL COST	$4.00

AT MARTINEZ

Mining	1.00
Milling	1.00
Haulage	.20
Concentrates (hauling)	.30
Smelting	.40
Freight	.70
Overhead	.40
TOTAL COST	$4.00

After applying the usual smelter settlement rates of about 95% of silver values and 90% lead less 1-1/2 ¢ per lb. the following returns could be reasonably expected:

MARTINEZ

From 6,093 tons of ore in sight, net profit $2.12 per ton

COLUMBIA SILVER BELL

From 71,343 tons ore in sight net profit 1.45 per ton

TOTAL net profits estimated from both operations from ore in sight. $119,275

To this amount should be added the gold, copper, zinc, and tungsten values that are recoverable and saleable.

EQUIPMENT

The property is now equipped with a 65 H.P. Tips distillate engine and a 320 cu.ft. Ingersoll two stage compressor. The blacksmith shop is up to date with machine sharpener. There are 6 drills on hand.

The Martinez shaft has a 15 H.P. gas engine hoist and the Silver Bell a 10 H.P. hoist, both in excellent condition.

There are plenty of cars, rails, pipe tools, etc. for development and mining requirements for at least one year.

The camp which is located about one-fourth mile below the Martinez has a good bunk house, cook house, guest house, and other buildings.

There is a good spring sufficient for domestic purposes with water piped to the cook house.

RECOMMENDATIONS

By sinking the Martinez shaft 100 feet or more much high grade galena as now showing at the bottom of the winze should be opened up. By such development sorted high grade shipments can be undertaken almost immediately and continued indefinitely.

The 50 ton pilot mill will make it possible to operate the property at a profit and by gradually increasing its size a return from operation can be had.

The Silver Bell should be opened by a tunnel on the vein from a point west of the Martinez shaft and would make available about 600 feet of additional mining ground below the Silver Bell precent 500 foot level. This work would prove the ore shoot of the Silver Bell on a large scale and be in production while so doing.

The construction of the 50 ton pilot mill alongside the Compressor house at the Martinez will make it possible to earn $100.00 per day or more and will thereby pay for the needed development. This mill can be increased out of earnings so as to produce about 200 tons per day at which capacity the net income will amount to approximately $500.00 per day.

As the mill capacity is increased it will be necessary to effect a connection with the power line which is now about 5 or

6 miles distant or to build an adequate power plant at Cochran Station and transmit power to the mine and mill.

Road construction is needed to shorten the route and avoid the box canyon now used.

CONCLUSION

The Silver Bell and Martinez property comprising 540 acres is well situated as to well established and proven mines of great depth and dividend earning capacity.

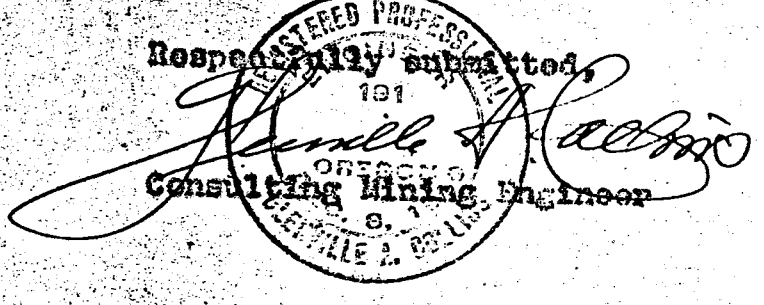
The transportation problem is quite simple being only five miles from the S. P. Ry., and over easy grades.

The strength, value, and continuity of the veins are splendid and offer every evidence of becoming a large mine.

The ore in sight and reasonably proven is ample to justify a pilot mill. This would serve as a means of earning the cost of developing the property in a large way.

The ore values should extend to great depth as in nearby mines of the district and there is every apparent reason why the Silver Bell and Martinez should equal the MagmanMine in value and extent.

Respectfully submitted,



Consulting Mining Engineer

COPY

To the President and
Board of Directors,
Silver Bell Cons. Mining Company
Santa Barbara, California

Gentlemen:

Pursuant to your request, I have made a personal examination of the Silver Bell group of mines and claims, and after spending five weeks on the property, submit the following as my report.

LOCATION

The Silver Bell property is located in Township 3 south, range 12 East, Section 18, in the Pioneer Mining District, Pinal County, Arizona, in a spur of the Pinal Mountains, Latitude 33 degrees 18' north, longitude 111° 10' west. The elevation is between 2,500 and 3,000 feet above sea level; it is a silver-lead property.

GENERAL INFORMATION

The nearest towns are Florence, the County Seat, fifteen miles away; Ray, ten miles away; and Superior, also ten miles distant. All three can be reached by wagon routes, but the shortest way to Superior and Ray is via mountain trails.

ROADS

In the olden days a wagon road used to run from the Silver Bell mine to Price, on the Arizona Eastern Railroad, which passes within five miles of the property. Distance to Price via this road is about eight miles. The nearest station of the Arizona Eastern Railroad is Cochran, five miles away. The wagon road is at present in bad repair. The logical solution for providing shipping and transportations facilities would be to build a siding on the Arizona Eastern Railroad about halfway between Cochran and Price, repair that part of the road which would tie up with the proposed new route, and construct whatever additional new road is required. Such road would be mostly downhill and bring the railroad loading and shipping siding within five miles of the property.

CLIMATE

The climatic conditions are such that the property can be worked all year round.

The labor supply is plentiful and the scale of wages paid are according to the miner's union scale, which rate is adhered to by all the operating mines of the district, large and small.

OTHER LARGE OPERATING MINES

The nearest large operating mines whose shares are listed at the stock exchange are the Ray Consolidated at Ray, and the Magma Mine at Superior.

The Ray Consolidated is capitalized at $16,000,000, owns 2,143 acres of mineral, and 4,454 non-mineral lands at Ray and Hayden. Equipped with a mill of 10,000 tons daily capacity. Mine is operated on shrinkage stoping system. Total dividends paid, including March, 1919, $21,469 -- note. Dividends to date are over $30,000,000.

The Magma Copper Company is capitalized at $1,500,000, owns 1,160 acres of mineral lands at Superior. Equipped with a 300 ton mill. Product: Copper, Silver, Lead and Gold. Paid in dividends to January, 1920, $1,704,000. Note. This company has just decided to spend $4,000,000 to build a smelter at Superior and increase the mill from 300 to 600 tons per day capacity, and also broaden the railroad they own.

SUPPLIES

Cost of supplies will be normal, since goods can be shipped in over standard gauge railroad, the A.E.R.R. subject to a five-mile haul by truck, after wagon road has been repaired and rebuilt.

WATER

The present water supply is more than sufficient for all camp and domestic purposes and ample water can be developed whenever required for milling or reduction operations.

HISTORY OF PROPERTY

The Silver Bell was discovered about forty years ago and famous in the olden days as a silver bonanza. Dr. Tibbets, in his report dated January 1, 1901, states, "The Columbia and Silver Bell Mines were operated by the Pinal Mining Company at intervals for a period of ten years. During the time the company operated a smelter on the Gila River, five miles away. As a result of a short run they shipped a hundred and four carloads of bullion, value not obtainable by reason of the looseness with which the books of the old company were kept."

When Silver was demonetized and the price of silver took such a material drop, the mine was shut down. At intervals, leasors have since operated the Bell during intermittant periods. Since the nearest railroad in those days was the Southern Pacific with the nearest shipping point Casa Grande, sixty miles away, it paid only to ship the highest grade of ore. Consequently, these leasors did very little development work, but contented themselves with hunting for the exceedingly rich pockets of ore scattered throughout the ore deposits. As a result, the present sampling really does not do full justice to the property, for due to this gouging by leasors and wandering prospectors, who helped themselves to exposed rich ore, without opening up any new ore bodies, only the leaner ore remained exposed. There is no doubt, that with very little development work, rich kidneys and shoots of the high grade ore for which the Bell was famous in the olden days, will be opened up again.

DESCRIPTION OF THE PROPERTY

The property of the Silver Bell Consolidated Mining Company consists of twenty-five claims, or 450 acres. Three of these claims or 60 acres, the

Silver Bell, the Columbia and the Martinez, are patented. The rest is held by right of location. Titles are perfect and there are no litigations or incumbrances against the property. At present there exist no surface improvements, such as shops, building or power plants. There is, however, quite some tract still in place in the mines and a small hoist and skip on the third adit of the Columbia Mine.

DEVELOPMENT WORK

The development work in the Silver Bell and Columbia workings consists of 4,330 feet of adit, drifts, cross cuts, inclines and winzes, as tabulated below:

Number One Adit	60 feet
Number Two Adit	750 feet
Number Three Adit	1,750 feet
(Including drifts and cross cuts)	
Intermediate, between No. One and No. Two Adit	150 feet
Intermediate, between No. Two and No. Three, Drifts	240 feet
Below Adit Number Three, Drifts	830 feet
Incline and Winzes	550 feet
TOTAL	4,330 feet

Most of the development work is in the ore body. In fact, ALL but 450 feet of adit number three, which is parallel to the deposit on the foot wall side and connects with the drifts on the vein by cross cuts.

The upper workings, close to the surface consists of overhand stopes, and an underhand open pit or glory hole, from which several hundred thousand dollars worth of high grade ore was extracted. The deposit showing stope width of approximately twenty feet as mined.

Intermediate drift below adit number one, for 150 feet shows ore for the entire width of the drift. It is connected with the number one and two adits by four winzes.

Number two adit has followed pay ore in two parallel drifts, which show good values the entire width of the drifts and the sample value from cross cuts and connections is such as to indicate that the valuable ore deposit extends from drift to drift, which fact may be easily established beyond doubt by very little further cross cutting.

Between the number two and three adits, the ore shoot dips to the south and west and has been followed by two winzes and a small stope, all of which show strong high grade values. The extreme limits north and south, as well as the thickness of the ore body here, has not been thoroughly explored, but even at that a considerable tonnage of valuable ore is in sight.

In the north and south breast of the drifts from the number three adit the ore body shows strong and further extension will probably expose parallel ore shoots of similar value to the one already so well developed.

Below the number three adit no large amount of work has been done. The main drift has penetrated the shoot on its southerly strike and dip, showing high grade ore of good strength. The small stope has caved badly but evidence of further extension to the south and below is great. Cross cuts show excellent values extending twenty feet into the handing wall side, which evidence is also exhibited in the level above. Further development by cross cutting here will open up a large additional tonnage of good ore.

THE MARTINEZ MINE

Is opened up by an incline, 108 feet in depth, such on the vein, and 45 feet down, an adit on the vein cuts the incline and extends for 120 feet further on the strike of the vein. At 80 feet down a drift extends 60 feet to the south and 20 feet north, all in fine ore. At 108 feet and the bottom of the incline a drift south, and 30 feet long, exposed a fine grade of ore for the entire distance.

The ore body as a whole shows great strength. Most of the drifts and incline are entirely in ore, and the limits of the valuable ore are yet outside of the present workings. Numerous cross cuts will increase the developed tonnage materially without having to extend the adit, drifts and incline.

I believe the workable ore, for milling purposes, will prove to be 10 or 12 feet and possibly more in average width in which case the possible ore reserve estimated will be double than exposed at present. Several sections of the drift expose a definite hanging wall, but the foot wall does not seem to have been reached as yet.

FORMATION

The rock formation of the district is entirely eruptive. Sedimentary rock is strikingly absent. The prevailing rock is a Rhyolite and its blocky condition shows a well-developed fracture plane, parallel with the strike of the Columbia-Bell vein. Much cross-faulting is evidenced of extensive movements.

The Columbia-Bell mineralization has immense strength filling the broken area on either side of the central fissure of fissures to be considerable extent, locally in places 75 feet wide, seldom does the main line of lines of weakness show less than 5 feet in width and always accompanied by large fracture zones on either side. The Rhyolite generally is much broken and cut by canyons 1,500 feet in depth, which expose the fault fissuring the block movement for a long distance, together with a very strong mineralization. The district rock formation is similar to the formation of the largest silver-lead mining districts of Western America, such as Comstock, Virginia City, Nevada; Tonapah, Nevada, etc.

VEINS AND ORE

The two main veins on the property of the Silver Bell Consolidated Mining Company are the Columbia-Bell vein and the Martinez vein. Both have the same strike, viz. north 16° west, and dip 41° west. The latter shows to be a branch of the former as the veins come together in the Silver Bell claim, north of the present workings.

These veins show a maximum width of 75 feet and can be traced for a mile on the strike. Both show much fault movement by "sliken slides" mud gouch and cemented wall rock breccia, as well as extensive fault and cross fracturing. The vein filling is a red hematite of iron and hematite stained replacement deposit, carrying silica, lime and maganese, together with the valuable metals, both in the form of galena and its alteration forms, carbonate and sulphate, and silver as chloride mainly close to the surface. The sulphides are coming in in the lower portions.

The ore shoot in the Columbia-Bell vein dips 45° and strikes south 14° west. The strike of the Martinez shoot is south 60° west and the dip 35°. Both show 400 feet in length and are extending.

The other veins on the property are: The Aspen, the Aspen #2, two veins on the Aspen #3, the Cave Vein, Cave #2 and #3, and the Lorado. All of these veins show exceedingly strong and are all well mineralized. While but little work has been done on them the indications are such that there seems to be no doubt that they will open up valuable and extensive ore bodies when developed.

ORE RESERVES

At the time of this examination, the survey and sampling shows the following ore reserves, classified as follows:

Ore in Sight: These are ore bodies, with two, three, and four sides exposed and sampled every ten feet.

Probable Ore: These are ore bodies estimated as probable to be found for a limited distance beyond the ore in sight. One side was exposed and sampled every ten feet.

Possible Ore: This is a calculation based on general indications of the ore likely to be found within the limits of the Columbia-Bell Martinez, as far as opened up. The extension of the ore in sight and probable ore to the extent of 100% of the block values, laterally and into the foot or hanging wall, is very much indicated as possible.

ORE IN SIGHT

		Equated Metal Value in Place
Columbia and Bell, Blocked Out	58,807 tons	$ 639,115.00
Martinez " "	6,083 tons	102,484.00
	64,890 tons	$ 741,599.00
On Dumps, Martinez	910 tons	18,014.00
On Dumps, Columbia-Bell	12,536 tons	236,410.00
	78,336 tons	$ 996,023.00

PROBABLE ORE

Columbia and Bell	22,229 tons	$ 217,946.00
Martinez	3,056 tons	54,296.00

POSSIBLE ORE

Columbia and Bell	138,598 tons	$ 1,676,046.00
Martinez	14,878 tons	313,560.00
ORE RESERVE TOTAL	257,097 tons	$ 3,257,871.00

In calculating the ore bodies, only the ore deposits of the Columbia-Bell and Martinez Mines were taken into consideration, and no attention paid to the rest of the veins, on the property which will materially add to the ore reserves when opened up. The method of sampling and the system used was such as to give the value of the ore, if same is properly mined and treated, and the property developed and explored to the best advantage. Owing to the size of the veins, the drifts were entirely enclosed in them and the samples were taken by a cut, three inches wide and three inches deep, from both sides of the drift and across the top, making a section sample from 25 to 75 pounds in weight. This sample was then broken to minimum one quarter mesh, mixed and quartered to one third pound and then assayed by Baverstock and Payne of Los Angeles, California. This was mixed and broken to one half to a quarter inch diameter and progressively mixed and halved to about six pound weight.

The rejections from the samples were filed and retained at the mines. Galvanized sheet iron tags with stenciled numbers were nailed firmly into the sample cuts and the rejections from the 75 pound of the half inch material was left at and near each sample cut.

The estimation of the ore reserves involves the character of the veins and ore shoots. The veins show to be true fissures and possess marked evidence of extensive faulting and remarkable persistency in maintaining their course and parallelism in strike. Some portions of the ore shoots are low grade, other of high grade, but the change occurs both ways alternately, so that the estimation of the block values necessitates the mining of the lower grade ore with the better grade and higher grade ores, for often the difference in character is not plainly visible by simple observation. In addition with the nature of true fault fissures parallel shoots may occur at intervals, so that the lateral extension of the commercial ore can be predicted and estimated and such estimation safely allowed for possible ore, as the veins are strong in all drifts and laterally on the strike.

Originating in dislocations, caused by extensive movements, the extension in depth will be great and should give permanent and long life to the mines.

COST OF MINING, TREATMENT, ETC.

This is based on the following analysis:

Insolubles	70 to 80%
Iron (Oxides)	5 to 10%
Lime (Carbonates)	2 to 4%
Maganese	1 to 2%

This is exclusive of lead and the metal values and give a fair idea of the gangue material. There will be no difficulties in the mechanical reduction (grinding).

MINING

The mining costs will be very low. The ore drills easily and breaks easily. It stands without timbering. There is absolutely no water to contend with and shrinkage stoping system can be employed. The ore can be drawn without hoisting. Judging from costs incurred under similar conditions, $2.00 per ton will be more than ample to pay for the expenses of placing the ore in the mill or reduction plant bins on a daily tonnage of 100 tons or more.

The simple system of shrinkage overhand stoping should be used, for when the block is mined it can be drawn and the country rock allowed to cave. As mentioned before, no hoisting will then be required and just sufficient timbering for chutes and man ways.

TREATMENT

As the valuable metals are mostly in the form of carbonates of lead and chloride of silver, and much of the minerals disseminated, concentration of some form must be used. Stage breaking classification and classified machine treatment will recover at least 70% of the metal values, the balance up to 90% can be saved by flotation. Smelting of the concentrates to follow. Cost of this milling and concentrating should be less than $2.00 the ton, based on a 100-ton daily capacity.

The ore seems also adaptable to the chloridization on Volatilization Roasting process, where the resulting metal fumes are collected with Cottrell electric precipitator.

Six representative samples of 50 pounds each were sent to the U. S. Government Mining Experimental Station at Salt Lake City, Utah, and thoroughly tested by Mr. Varley to see whether or not the ore is adaptable to this process. Results were very gratifying and tabulated details of this test are attached to this report. Under favorable conditions practically 100% of the gold and lead may be recovered; 85 to 98% of the silver; and 80 to 98% of the copper. This process will reclaim all metals contained in an ore.

Roughly speaking, the cost of such a plant would be $1,000 per ton capacity and the cost of treating the ore would be $4.00 per ton. The resultant saving in freight when shipping pure metal instead of ore or concentrates of ore would increase the profits of the operation considerably. This process would also do away with the expensive smelter treatment charges, as the product would be shipped and sold to the refiners of metal direct.

MARKETING

Whether a combination milling-concentration-flotation process or the Cottrell precipitation is used, the reduction of the ore into concentrates or bullion will be about 20 to 25 tons of ore into one ton of concentrates or bullion. Hence, the marketing cost against each ton of ore (original ore) should be within $1.00 the ton, for on above basis this would give $20.00 to $25.00 per ton for the product to be shipped. The cost would be approximately $2.00 per ton for hauling to railroad, about $12.00 smelter charges and $6.00 per ton freight. The smelter charges would fall away when bullion is shipped, but there would be an increased freight charge for shipping bullion.

TOTAL COST MINING, TREATMENT, MARKETING

Mining	$2.00 per ton
Treatment	2.00 per ton
Marketing	1.00 per ton
	$5.00 per ton

RECOMMENDATIONS

Owing to the particular nature of the Martinez Mine ore deposit, considerable of the ore in sight contains lenses of solid galena and carbonate of lead. By sorting, this ore could be shipped and made to yield 50% of lead and over 5 ounces of silver. The combined mining and sorting cost should not run over $5.00 the ton. A five-mile haul by truck to the railroad, the freight and smelter treatment charges would amount to about $16.00 which would leave a net profit of some $20.00 per ton on such ore shipments.

In order to start shipping from the Martinez and draw the ore from the bottom workings of this mine, 296 feet of adit should be constructed, which adit would connect with the bottom of the present incline shaft. This would do away with all hoisting operations. An ore bin should also be constructed near portal of this adit. The present wagon road to the railroad is in bad repair. About two and a half miles of the five miles require new construction. The balance can be repaired. Work on both adit and the road might be started simultaneously, as both will require about the same amount of time for their construction, and with the adit completed and the road ready for hauling, ore shipments from the Martinez can begin.

It will also be necessary to put in a railroad siding about half way between Cochran and Price, and an ore bin and loading platform at this siding.

There should also be installed at the Martinez a medium size power plant, such as a 75 HP internal combustion engine, with compressor, air receiver, drills and other accessories of proportionate size. With this power equipment and by keeping half of a force of men developing ore, and the other half breaking ore, the Martinez would open up rapidly and produce a handsome monthly net profit.

Next, a good truck road should be constructed from the Martinez Mine up to the Columbia-Bell Mines, a distance of about 2,500 feet. As soon as the Martinez Mine is shipping, or even before, an adit connecting with the lower workings of the Columbia-Bell should be constructed.

This would consist of a 150 cross cut to the Columbia vein, and a drift of some 800 feet on the vein proper. Besides making it possible to draw the ore from the Columbia-Bell workings, without hoisting, this adit will without doubt open up large and valuable new ore bodies and materially increase the ore reserve, and thus pay for itself many times over. This opinion is expressed by several other engineers who have examined the property.

A power plant should next be installed at the Columbia-Bell Mine. Would suggest a 150 HP internal combustion oil engine with compressors, drills, electric and other equipment of proportionate size(NOTE: Since then government electric power has become available, so that we won't have to generate our own electricity.)

TREATMENT PLANT

While much of the ore from either Martinez or Columbia-Bell Mine can be shipped direct to the smelters, the most profitable and economical way would be to take the ore as a whole and in some manner concentrate and reclaim the metal values. Whether a milling or the Cottrell precipitation plan is adopted, the logical place for the erection of either plant would be at the latitude 10,500 departure 16,000 in the main draw, and just below the Martinez Mine.

The ore from the Martinez Mine would thus go directly into the hauling. When productions have reached a large scale, an aerial tram would be the most economical means of transporting the ore to the reduction plant, but until a plant of at least 300 ton capacity is in operation, hauling by truck will be more economical.

If ore hauling by truck is contracted for, no initial equipment expenses is required and the ore could be hauled for 40 cents per ton-mile. This would mean 20 cents per ton for the distance hauled. An aerial tranway handling 100 tons per day, which will no doubt be the capacity of the first reduction plant until is in proportion far more expensive than a tramway that handles several hundred tons per day, as both sizes will require the same expensive terminal and necessary equipment.

Aerial tram hauling would come to about ten cents per ton. Based on a 100 ton-per-day capacity the actual saving is small and would amount to only $3,000 per year. Against this must be figured the tram investment charges, depreciation, etc. Also, that with an initial cost of such a tram of $25,000 it would require eight years to offset this outlay and at the end of eight years the value will prectically have depreciated.

When, however, a reduction plant of 300 tons and more is up, a larger tram will be required, but the savings will be greater the proportionate cost of this tram smaller, and the same will pay for itself before it is worn out.

CONCLUSIONS

Five weeks, spent in a thorough examination, careful and systematic sampling, and the use of conservative figures, has established the following facts:

ORE IN SIGHT

Blocks Opened of Two, Three and Four Sides, Sampled Every 10'.

Columbia-Silver Bell Mine, Blocks	58,807 tons	$ 639,115.00
Martinez Mine, Blocks	6,083 tons	102,484.00
Total	64,890 tons	$ 741,599.00
Columbia-Silver Bell Mine, Dumps	12,536 tons	236,410.00
Martinez Mine, Dumps	910 tons	18,014.00
TOTAL	78,336 tons	$ 996,023.00
Less 15% loss in course of treatment		149,403.00
		$ 846,620.00
Mining, Marketing, Treatment, $5.00/ton		391,680.00
Resulting Net Profits from this Part		$ 454,940.00

It should be borne in mind that the ore in place values have been estimated very conservatively and that there are scattered throughout the ore bodies kidneys of exceedingly high grade ore, which will materially increase the value of the ore in sight, but which factor has not been considered at all when computing these figures.

In estimating the total ore reserve, including the probable and possible ore, this estimate has been computed solely on the Martinez and Columbia-Silver Bell Mines, not taking into consideration the veins of the Lorado, the Aspen, the Aspen #2, two veins on the Aspen #3, the Cave, the Cave #2 and #3, and the Silver Pick.

Proper development work on these veins will without doubt open up additional ore bodies similar to the ones encountered on the Bell, Columbia, and Martinez, and immensely increase the ore reserves of the property, assuring its permanency and long life.

The total ore reserve of ore now in sight, probable and possible ore, (not including the undeveloped veins) would yield as follows:

Columbia-Bell Mine	232,170 tons	$ 2,769,517.00
Martinez Mine	23,227 tons	488,354.00
	255,397 tons	$ 3,257,871.00
Less 15% loss in treatment		488,680.00
		$ 2,769,191.00
Mining, Treatment and Marketing; $5.00 per ton		1,276,985.00
Net Profit on Operation		$ 1,492,206.00

SUMMARY

To summarize, I wish to say that I consider the property to be one of exceptional merit. Much of the success of the enterprise will, of course, depend upon competent and efficient management, and upon the result of systematic exploration of the veins and ore bodies, but I do not hesitate to say, that I believe that the metal values will prove permanent with depth and that the property will be not only a very productive one of long life, but also a WELL PAYING ONE.

Signed, H. B. Starbird, E.M.

May 25, 1920
Superior, Arizona

COPY

REPORT ON THE EXAMINATION OF THE MARTINEZ AND SILVERBELL MINES (ARIZONA)

The investigation and examination of the Martinez and Silverbell Mines presented a fourfold problem:

1. The examination of the geological formations in which the ore bodies are found, the determination of the character and evidences that could warrant a continuation of the known deposits, and the probable discoveries of new ones;

2. The determination of the character of the deposits, their size and volume;

3. The present state of the mines regarding the possibility of their development for a more intense exploitation of the deposits;

4. The necessary conditions under which the enlargement of the mines would be advisable in case the results obtained from 1, 2 and 3 could be considered favorable for such enlargement.

In order to eliminate any possible bias from my opinion about the property and its improvements, and to reach a conclusion that would not be influenced by any previous reports or data, I had to start my work as if it were an original one and treat it in such a manner as if this kind of work had been performed for the first time. If later, some reference to the past work in the mine is made, then it has the value of an illustration of the location of ore and the system adopted for its mining in the past.

The examination also had to disregard the recordless claims of the great riches extracted in the past, and I had to base my judgment on the actual conditions prevailing in the mines at the time of their examination. Samples were collected from many places, assayed and then compared with each other, serving in such a way to establish the value and content of the ores.

I have omitted the geographical description and history of the property, which can be found in H. B. Starbird's reports of May 25, 1920, and which are later repeated in G. A. Collins' report of August 1934.

GEOLOGICAL INFORMATION

The surface of the majority of claims, including the Martinez claim on which the Martinez Mine is located, and the Columbia and Silverbell claims on which the Silverbell Mine is located represents a rugged broken up and partially eroded cap of a rhyolitic formation of great magnitude and thickness. The beds of creeks, as well as the existing lowest levels in the mines, indicate that this massive and enormous in size rocky formation has not yet reached its end, and there are no indications that this end is anywhere near. This rock is easily distinguished and being the carrier of the valuable ore bodies, assumes an importance and significance for the investigator of the deposits.

This Rhyolite represents an igneous rock composed mostly of fine grained alkalic feldspars and quartz. The rock is dense and appears as a uniform and homogeneous substance. The joining is platy or in small blocks. The usual color ranges from gray, through pink to light red, due to the presence of ferromagnesian minerals, which being decomposed leave rusty spots, and being removed from their places by wind and water, leaves cavities of various sizes. The rocks crumble at these places and cover the slopes of the hills with loose rocks. Beside these changes the rhylitic formation has undergone another form of destruction which has been caused by the dislocation of great blocks of rocks due to the formation of a number of faults along which the sliding of the blocks against each other took place. The faces of the faults are smooth and sometimes highly polished and the space between them ranges from 2'0" to 30'0" and possibly 35'0". This space is filled with pieces of broken up rhyolite, which very often retain their identity, and with the products of their decomposition occuring as a natural result of changes in the composition of minerals entering into the make-up of rhyolite. And so we have a clay surrounding the debris and sometimes veins of calcite, quartz and flourite, everything having a reddish brown color due to the presence of iron oxide.

All known, exploited and investigated veins of ore on the property are confined to these faults. The ore bodies, composed of lead and silver compounds with traces of gold and small quantities of copper compounds, are disseminated between the broken up and disintegrated masses of the original rhyolite, accumulated between the two sides of the faults, which sides form the hanging and foot walls of the veins. It is natural, therefore, that practically all of the existing galleries and workings in both mines, the Martinez and the Silverbell, are following these faults and that the possible end of them would be an end of the ore deposits at these places.

It is evident that the penetration of metallic ores went along these faults representing lines of least resistance for their travel. The mineralization of the breccia (disintegrated material between the walls of the faults) did

not follow the full width of the faults with a uniform intensity. High-grade ore is found sometimes at the hanging wall, sometimes at the foot wall, and also at the centers of the veins, leaving the rest in a state of lesser accumulation of minerals. The ore, therefore, is of various values -- from mill ore to low grade with an inclusion of high grade ore at some places.

The mineral deposits of both mines were formed along the same law, and the same forces of nature have been at work when the faults were changed into ore veins. There is one difference between the two; Whereas the Martinez Mine is a predominantly lead ore mine, having the silver compounds as subordinate minerals, the Silverbell is more azurite (combinations of carbonates and oxides of copper) and chalcopyrite (copper-iron-sulphur combination) are encountered in both veins as well as traces of gold.

The succession of the formation of ores in the mines is easily detected by examination of the ores. The lead ores consist of galena, cerussite and anglesite (sulphide, carbonate and sulphate, respectively) and are always accompanied by silver sulphide (argentite) and mostly silver cloride (cerargyrite). Galena is distributed unevenly in the vein and in most cases appears in the form of rounded pebbles or boulders covered with lead sulphate and lead chloride, the latter representing a product of decomposition of galena. In many instances this decomposition went on to the full disappearance of galena and its replacement by lead sulphate and carbonate. The silver compounds are usually found distributed in galena and its derivatives. Galena in its natural form is always an indication of the presence of high grade lead and silver ores in its vicinity.

The classification of ore into high-grade, milling ore and low grade has been made on the basis of the present working conditions in the mine and serve to indicate its lead and silver content within the following limits:

1. High-grade or shipping ore:

   15 oz. (or more) of silver with whatever quantity of lead might happen

   or 6% (or more) of lead with any amount of silver not less than 10 oz.

2. Milling ore:

   Containing not less than 5% of lead or 8 oz. of silver, or both.

3. Low grade ore:

   All other ore falling below limits for milling ore.

The above limits are arbitrary and depend on the efficiency of the concentration plant operation. With the improvement of the plant these limits can be extended, and the low grade ore of today may become a milling ore of tomorrow.

The two mines are working at present in two faults, but four more are known to exist (and possibly more) and the determination of their contents has yet to be done. The two main faults have practically constant strikes and dips, the other very nearly follow them.

The Martinez vein has a strike N 15° W and a dip from 45° W to 52° W. The Silverbell strikes N 25° W and dips 42° - 45° W.

There are a few cross veins along the main Silverbell vein that can be seen inside the mine. At these places the vein is usually enlarged.

The extent of the veins has never been determined. The natural limits of the upper levels are the slopes of the hills in which the veins are located, the lowest levels reaching a depth of about 300', do not show that the extension of the ore body is going with the depth. It can be shown that in some places lenses and kidneys of very rich ore have been found in the lower levels. It is not possible to state at present whether or not a change in the value of ore in either direction is possible with the depth. One thing is clear, that the mine can be worked deeper with good prospects in view.

On the surface the outcrops of the Martinez Mine vein are clearly visible and can be followed for about 50' to the south of the incline, after which they disappear under the debris of rocks from the surrounding mountains, but the fault can be traced still further to the south as far as 250'. Also to the north of the incline and across the Martinez Canyon one can locate the continuation of this fault. Samples taken from the outcrops show an average of 5% lead and 3 oz. of silver and from the other side of the canyon only traces of lead and as high as 5 oz. of silver. It has to be realized that these samples were taken close to the surface, where a destruction of the minerals always takes place, and the results can serve as an indication of the probable presence of good ore in these places. Only a more extensive research could definitely supply information as to the extent and content of these veins.

The Silverbell fault, containing the Columbia-Silverbell vein, has been traced for about 1000' on the surface north of the "Glory Hole" (top of the hill and point of the original start of work years ago) and also for about 1000' to the south of this point, which shows that the lower level workings in the Silverbell mine are not confined to their existing horizontal extent and can be increased in their length at still lower levels.

In order to study the possibility of finding other ores (besides lead and silver) the district between the Magma Mine and Ray has been investigated and the geological formation interconnected. It occurs that rhyolites are the upper formations below which are located diabase, granite, amphibolic porphyry,

dacite and then limestone. The majority of the existing mines have started out as lead-silver mines on the higher levels and finally were transformed into copper mines in the lower levels and are operating as such at present. Though it is too early to predict such a trend in the Martinez and Silverbell mines, there are indications of the presence of small quantities of copper minerals throughout the veins. The investigation of lower depths might show how correct this general rule is for the veins on this property.

The Silverbell, located at higher levels, is a dry mine and no water has been encountered in it although some dampness shows up at the lower levels. Possibly that water can be found still lower with the advance of the mine.

The Martinez Mine has a very well defined water level (below the fourth level) which does not show any considerable changes in elevation. This water is the only supply that is used on the property for the purpose of ore concentration and seems to be adequate for all needs at the present time. There is no doubt that the amount of water available from that mine will increase with the depth and that the needs in water for an increased production can be easily met in the future.

ORE RESERVES

As indicated before, the thickness of the veins presently under exploitation are varying in thickness and content. In the Martinez Mine the lead content drops very seldom below 4% and this percentage can be considered as the lowest limit. An average of 8% will be a conservative one. Silver drops very often to 0.3 ounces but raises in some places to 3 ounces. An average of 2 ounces per ton can be accepted.

The lead content in the Silverbell Mine is varying from traces only to about 4%; 2% can be taken as an average. Silver varies from 4 ounces to 13 ounces to the ton, the higher limits prevailing. Kidneys with as high as 1,006 ounces of silver were found at places close to the top of the mine.

Wherever galena is found the content of lead is reaching 72% and 35% in close vicinity.

The determination of ore reserves has been principally done on the basis of visible and existing beyond doubt ore. This ore is exposed in the workings and on the surface of the mines.

MARTINEZ MINE

About 3,000 tons, some high-grade ore. Average content 8% lead, 2 oz. of silver.

Most of the ore has been taken out; the remaining is included between the main incline drifts and raisers in the form of blocks and can be easily taken out.

The vein does not show any strength to the north and south of the incline at the upper levels and wedges out at short distances from it.

At the lower levels the vein becomes stronger and its extent in the horizontal direction is more prominent. At the third and fourth levels the workings are followed in ore which stops at the south end and continues as a low grade ore to the north. Another 1000 tons can be taken out in the existing levels if continued. Below the fourth level we are entering the water zone of the mine. No work has been done below this level, except the sinking of a sump for the accumulation of water. There are indications that the ore is continuing below the fourth level in some places as high-grade. Its extent can be determined only when some exploration work is done. It is advisable to make this exploration work pay for itself by working at points of high-grade ore exposures.

For all practical purposes the Martinez Mine down to the fourth level can be regarded as a very much exhausted mine and if additional paying ore is not found below the fourth level all the visible ore would have to be cleaned out and the mine abandoned as a source of ore but partly maintained for the sake of water, of which the mine is at the present time the only supply.

The ore exposed on the surface could supply about 500 tons of low grade ore and that would make a total of 4500 tons of visible ore in the Martinez with an average content of 6% lead and 1-1/2 oz. of silver.

The dumps at the mouth of the mine do not represent any tangible value. Occasional pieces of highgrade ore can still be found there, but as a whole the dump is very well combed through.

SILVERBELL MINE

The ore here is of uneven character. High-grade is intermixed with milling and low grade ore. At the top of the vein (Glory Hole) the richest ore has been located, but in an attempt to extract the richest pieces only the former operators have ruined a great part of the vein at that place, leaving cavities in such a state that it is dangerous to carry on the work. Some quantity of this rich ore can still be taken out, probably to the extent of ten cars. Other places yield rich ore also. The south of 400 level shows a concentration of rich ore running strong in silver at about 40 oz. In general such places are not encountered very often, though there are chances to find them scattered while proceeding with the normal work in the lower levels.

The possibility of find high-grade lenses and kidneys have been entirely eliminated from the calculation of the reserves, and only normal ore with a content of from 5 to 13 oz. of silver has been taken under consideration.

Here also only the visible supply has been figured. As far as it could be seen at present, about 55,000 tons of ore are contained between the different levels. Some of the adits can be continued closer to the slopes of the hill and the lower levels could serve as a base for work necessary to establish new levels. At the lowest so called 400 level, the ore is showing a sound composition and can be followed below this limit.

It is evident that the quantity of visible ore will grow with the development of the mine below the 400 level, and that the Silverbell Mine can supply ore for a number of years to come.

The ore in the dumps is of the same value as that in the Martinez.

The values of the visible ores are calculated on the basis of their present market prices with a reduction of 15% for losses and penalties:

MARTINEZ	4,500 ton	6% lead	1-1/2 oz. silver
	Value	$ 29,750.00	$ 4,298.00
SILVERBELL	55,000 ton	2% lead	8 oz. silver
	Value	$ 93,500.00	$283,942.00
	TOTAL	$123,250.00	$288,240.00

Together the value represents $411,490.00.

All combined expenses per ton of ore should not exceed $4.50 which would make a total expense for all visible ore of 59,500 x $4.50 = $267,750.00. Putting aside $24,000.00 for development and equipment, the total profit would be about $124,000.00. By working 100 tons a day the visible ore can be extracted in 595 days or 1-3/4 years, and in the meantime the mine would be prepared for continuous work at the same rate.

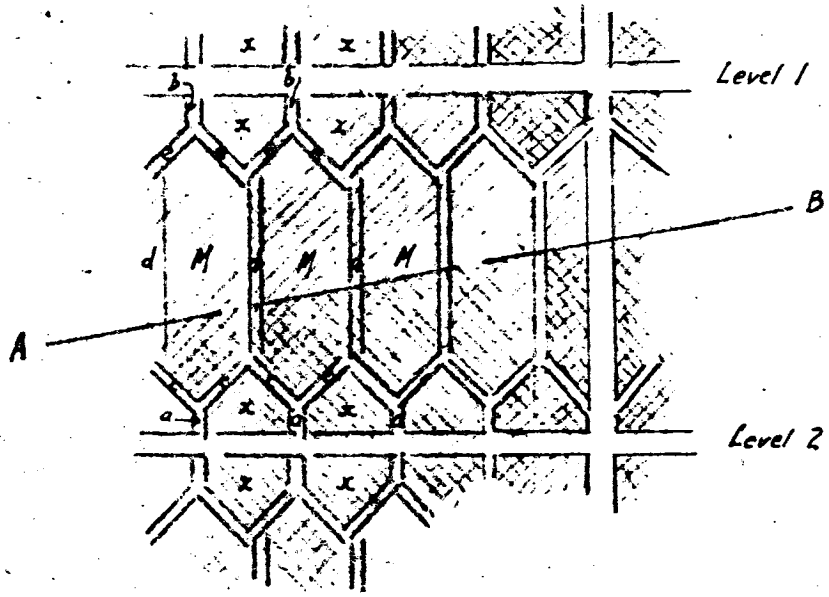
High-grade ore from both mines naturally would increase this profit, but as stated before it has not been taken under consideration.

THE UNDERGROUND WORK

At present the production in both mines is about 20 tons per day. Work is being done by hand and no compressed air equipment is being used. The average production per man per day is about 3 tons. The normal production in other mines working with similar physical properties of ore is about 10 tons per man per day. The cost of mining (all expenses included) is here about $2.00 per ton of ore, whereas in the other instance it is not greater than 75¢. The Martinez and Silverbell Mines require a minimum of timbering and the mining conditions are, therefore, much more favorable than in other mines. The productivity of the mines could be increased if an adequate compressed air and hoisting equipment were installed. The presence of this equipment is not the only factor

the only factor affecting the normal work of the mine. A system of work (stoping) most suitable for the existing conditions in the mine (thickness of ore body, dip and strike, character of hanging and foot walls) must be devised so that with the least expenses, efforts and danger to life the best results could be obtained. Up till now no such system is in existence. The ore has been mined in a "grab-as-you-go" way with no idea of developing the mine for the future and taking out whatever rich ore has been encountered. The horizontal workings (drifts) have been used for the purpose of reaching or discovering rich ore which has been taken out in a most ruthless way, with the result that at certain places the mine is losing great quantities of good milling ore. Even for the last 8 to 9 months no attempt has been made to establish a standardised system of work.

After a careful study of the conditions of work and physical properties of the veins, I am submitting the following scheme of work in the mine:



Horizontal workings or levels of normal cross section are established at a distance of about 60' from each other. Beginning at a lower level (say level 2) raisers "a" are being cut 3' to 4' long, then inclined raisers "e" are run to the sides of the future mining chambers "M" which are about 25' wide. Vertical raisers "d" are then continued to a point at the upper level 1 which is symmetrical to the points at level 2 and then proceed with raisers "e" and "b" until level 1 is reached. All the ore is being delivered to level 2 by gravity and from there to the shaft or incline. After this preliminary work begins the cleaning out of the ore from the chambers, raisers acting as chutes. Double shaded areas indicate ore still in place, single shaded ore taken out. Work proceeds in several chambers simultaneously along line "AB" leaving pillars "x" along the levels and also along the incline to protect them and built in as transportation arteries. After the ore has been taken out from the chambers caving in is permitted to follow after some time. In some zones levels

affecting the normal work of the mine. A system of work (stoping) most suitable for the existing conditions in the mine (thickness of ore body, dip and strike, character of hanging and foot walls) must be devised so that with the least expenses, efforts and danger to lift, the best results could be obtained. Up till now no such system is in existence. The ore has been mined in a "grab-as-you-go" way with no idea of developing the mine for the future and taking out whatever rich ore has been encountered. The horizontal workings (adits) have been used for the purpose of reaching or discovering rich ore which has been taken out in a most ruthless way, with the result that at certain places the mine is losing great quantities of good milling ore. Even for the last 8 to 9 months no attempt has been made to establish a standardized system of work.

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destined to be abandoned, the pillars can be taken out by underhand and overhand methods. This scheme requires very little or no timbering and will give the maximum tonnage per man.

The work can be so organized that some levels in the Silverbell Mine can serve as points of departure for that scheme, and after all development work has been done five men can work in each chamber delivering 50 tons of ore per day. So two chambers would deliver 100 tons per day and so on. The normal and constant work along these lines can be easily and quickly arranged.

CONCLUSIONS

1. The veins exploited in the Martinez and Silverbell Mines must be regarded as sources of milling ore only.

2. Kidneys of high-grade shipping ore will be found while proceeding with the normal mining work underground, and will raise the value of ore considerably, but cannot be used as a basis for calculating the value of the ore.

3. Some exploring must be done in the Martinez Mine in order to determine its fittness for a prolonged life. Otherwise the ore reserves must be considered as coming to an end.

4. The Silverbell vein shows great strength and can possibly supply the needs of the mill for a long time.

5. New sources of ore might be located on the property, but this needs some special investigation and expenses.

6. Mining costs must be reduced by installing compressed air equipment for drilling. Hoisting facilities must be increased also.

7. A new system of underground work must be adopted.

8. The mines can be prepared to produce 100 tons of ore per day within two months.

Respectfully submitted by

Anatol Glas, Mining Engineer

October 6, 1937

No duplicate

Mr. J. A. Holoms
Richmond, California

Phoenix, Arizona
June 4, 1943

REPORT OF THE SILVER BELL-MARTINEZ MINES
by L. Lee Boyer, Reg. Assayer & Con. Engin.

Dear Sir:

I have made a personal examination of the Martinez Mine, on which most of my findings are based, and after my surface and underground survey, which involved some six or seven days laying out the stopes, winzes, and drifts, I took several channel samples from different levels in the mine and made a systematic sampling of the shaft. A memorandum of my findings with the longitudinal and lateral drawings, showing where each sample was taken by series A, B, C, and D, are hereby submitted.

LOCATION

The Silver Bell-Martinez property is located in Twp. 3 S., Range 12 E., section 18 in the Pioneer mining district, Pinal County, Arizona. The property lies in latitude 33° 18' N., longitude 111° 10' W. The general location, relative to known points, is approximately 8 miles south of Superior, Arizona in a direct line and some 15 to 16 miles northeast of Florence, Arizona, the county seat of Pinal County.

HISTORY

The Martinez was located January 1, 1880 and surveyed for patent by L. D. Chillson, February 4, 1887. A patent was issued at that time. In the early days, a company known as the Pinal Consolidated Mining Company was formed for the purpose of exploring and developing the Silver Bell, Columbia, and Martinez claims.

From the old reports, some $1,000,000 in ore was extracted from the Old Silver Bell workings, between the years 1880 and 1883. The ore was hauled by wagons to a smelter on the Gila River at Cochran, Arizona which was producing lead-silver bullion. At that time, very little attention was paid to the Martinez claim, located approximately one half mile south of the Silver Bell claim, but later the large vein was discovered and some shallow development work was done. But when silver was demonitized and prices took such a material drop the mine was shut down. Later the properties were intermittently worked by leasors. But the mine as a whole has had very little development or exploration since work was discontinued by the Pinal Consolidated Company.

Due to high freight rates and the cost of inadequate transportation from the mine to railroad, the leasors were compelled to mine only the exceedingly rich pockets of ore scattered through the vein, which resulted in the leaner ore being left in the vein. There is no doubt, that with very little development work, rich kidneys and shoots of high grade ore will be opened up again.

In a report by H. B. Starbird, E.M., under date of May 25, 1920, shows approximately 4,336 feet of development work in the Silver Bell and Columbia, consisting of drifts, cross-cuts, inclines, stopes, and winzes. I should like to quote an extract from Mr. Starbird's report and tabulate the footage:

Quote: "Number one adit. . . . . 60 feet
Number two adit. . . . . 750 "
Number three adit . . . . . 1750 "
(Including drifts and cross-cuts)

Intermediate, between number one and two adit	150 feet
Intermediate, between number two and three drifts	240 "
Below adit number three drifts	830 "
Inclines and winzes	550 "
Total	4530 feet

Most of the development work is in the ore body, in fact, all but 450 feet of adit number three, which is parallel to the deposit on the foot wall side and connects with the drifts on the vein by cross-cuts. Intermediate drifts below adit number one, for 150 feet shows ore for the entire width of the drift. It is connected with the number one and number two adits by four winzes.

Number two adit has followed pay ore in two parallel drifts, which shows good values the entire width of the drifts and the sample value from cross cuts and connections is such as to indicate that the valuable ore deposit extends from drift to drift.

Between the number two and number three adits, the ore shoot dips to the south and west nad has been followed by two winzes and a small stope, all of which shows strong, high grade values." Unquote.

The Silver Bell and Columbia claims are also patented, the balance are held by rights of location.

Between October, 1937 and January, 1940, 1633 tons of ore were shipped to the smelter.

Silver	26.6 ounces	$18.62
Lead	7.55 per cent	7.55

Value per ton $26.17 Total Value $42,840.00

Liquidation sheets from the Martinez claim shows 2,400 tons of

ore shipped to smelters between 1926 and 1928.

Silver	11.73	ounces	$6.93
Lead	25	per cent	33.25

Value per ton $ 40.18 Total Value $96,432.00

In 1936 a small mill was erected on the Martinez claim and milling operations were started in January, 1937 and some 2,000 tons of ore was milled, most of which was taken from the Martinez dump. The mill operated but a few months. During it's operations, 295 tons of concentrates were shipped.

Silver	8985.8	ounces
Lead	239,311	pounds

Total Value $28,516.17

Due to mismanagement and litigation, the mill was closed down and has not operated since.

TITLE

The Silver Bell claims was surveyed forpatent November 22, 1881, consisting of 20.66 acres, known as lot number 39, survey No. 314. The Columbia claim was surveyed November 24, 1881, consisting of 20.66 acres, known as lot number 40, survey No. 315. The Martinez was surveye February 1, 1887, survey No. 799, consisting of 19.93 acres. The titles are clear and free from incumbrances. The two claims, situated in a direct line between the Martinez and Columbia, are held by virtue of location and assessment rights.

ACCESSIBILITY

The property of the Silver Bell-Martinez mines is situated favorably as to transportation facilities. A good truck road runs from the property to Price Station, approximately 7 or 8 miles to the southwest, connecting with the branch line of the Southern Pacific Railroad, previously known as the Arizona Eastern Railroad. One truck can load a

fifty-five ton car of ore in two days. The mine is also accessible by a good truck road which connects with Highways 60 and 70, approximately 12 miles distance. A good loading ramp is situated at Price Station. Both roads are in good condition and sufficient for heavy loading and for the transporting of heavy equipment and supplies.

TOPOGRAPHY

The topography of the country is undulating and for the most part rugged. The ridges run mainly northwest, southeast and rise to aheight of some 25 to 35 hundred feet above sea level.

GEOLOGY

The rock formation of the district is highly eruptive. Sedimentary rock is absent. In the immediate vicinity of the property, the predominating formation is rhyolite, showing a well developed fracture plane, which strikes parallel with the vein on the Martinez. Between the Martinez and the Silver Bell, the rhyolite generally is much broken and cut by canyons 400 to 500 feet in depth. Much cross faulting is evident. The fault, fissuring for a long distance, is well defined.

VEINS & DYKES

The Martinez vein is well defined, striking north 7° west and dipping to the west at a 53° angle. The hanging wall is a soft lime porphyry. The hanging wall is well defined while the foot wall is rhyolite, considerably shattered. It is evident that the line and vein matter filled the break relatively near the same period. The vein is highly mineralized with fragmentary quartz, hemotite, manganese, together with lead, silver, molybdenum, and copper. The values are found over the full vein width, but are not consistently uniform. However, the values found

throughout the mine indicate the entire vein output can be mined and milled at a good profit after the high grade ore has been removed.

The present workings show that the high grade lead sulphide or galena and cerussite ore is in evidence. It may be well to mention, however, that the drifts and stopes show that the greater amount of the work has been too far east of the hanging wall to encounter the rich kidneys or lenses. The recent developments also after a careful examination of the shaft, bear evidence of this fact. The Martinez workings lay about 150 feet to the east of a large lime porphyry dike, which cuts the vein near the northern end of the Martinez claim. This dike being of later origin has caused considerably shearing of the country and also of the vein at different points, therefore, it is reasonable to assume that a large amount of the ore was left in the old workings due to the lack of proper geological advice. This has been fairly well substantiated by the present management, who has recently discovered and shipped to the A. S. & R. smelter at El Paso, 55 tons of ore which was left on the hanging wall in one of the old stopes. The liquidation sheets show the return or assay of 19.6 lead, netting $966.84. Another 55 ton car of ore taken from the hanging wall in the old workings is now in transit. The returns on this last shipment has not been received to date but it is expected to run higher in values than that of the previous car.

The Martinez vein is geologically strong and most of the inclines and drifts are entirely in ore and as stated before, a large amount of the high grade ore has been overlooked. Judging from the rake and dip of the ore body, the main deposit has not as yet been encountered. The limits of the valuable ore is yet outside of the

present working, however, a large tonnage of workable ore still remains in the old drifts and stopes. The vein is 4 to 12 feet in width and some 2,000 tons can be easily mined and milled. At present, the mine is making about 7,200 gallons of water per day, which is ample for milling 1,000 tons of ore per month which is the approximate capacity of the mill. Due to the fact that the water in the sump goes down rapidly to a certain level and then so slowly thereafter, would indicate that the water table is near where ample water can be developed for large milling operations.

Water for domestic purposes is supplied from a fine spring which supplies all the domestic needs. Climatic conditions are favorable for year round operations.

EQUIPMENT

At present the mine is equipped with the following:

2,000 ft. Standard mine rail
1 Leroi Rix model D-318 Compressor with motor model E2 P 105
1 22 hp Electric Hoist and generator unit
1 Gould centrifugal water pump, 1 1/2" capacity driven by a 5 hp electric three phase motor.

The mine is partly wired for electricity. A well equipped blacksmith shop, two or three ore and timber cars, one T 20 tractor, one 1937 Ford V8, 1 1/2 ton capacity dump truck and three older model V8 Ford trucks that with some repair can be put back into operation. The mine is also piped for air.

MILLING EQUIPMENT

The Martinez is equipped with a small mill of flotation type, driven by a 65 hp Tips semi-hothead motor. The balance of mill equip-

ment are as follows:

1 Ingersoll Rand Imperial Compressor, type 10B in good condition
1 75 ton Steel Ore Bin
1 Jaw type crusher
1 Door classifier, rake type
1 Ball mill, 35 to 40 ton capacity
Flotation cells
1 Denver thickener
1 12,000 gallon water tank
1 30 ton Primary ore bin
2 Conveyors, belt type
1 Elevator

All shafting, pulleys, and mill timbers and buildings are in excellent condition. It will be well to mention that all equipment is well preserved and with comparatively little additional construction the mill can be easily altered to enjoy the maximum mineral recovery, all of which shall be accomplished under the supervision of Mr. T. S. O'brien, metallurgical engineer, and experienced operator, who is at present in charge of developments.

The camp is equipped with 5 or 6 small frame buildings sufficient for housing a small crew of say 10 or 12. At present the camp is situated a short distance west of the Martinez mine and at that locality two or three places in the canyon can easily be excavated for the construction of modern cook and bunk houses.

RECOMMENDATIONS

Due to the particular nature of the ore occurrence in the Martinez and after several days of careful study relative thereto, in addition to several weeks directing the metallurgical research during the early milling operations in the early part of 1937, during which time the property was under the management of the Collins Pacific Company, I

wish to submit the following recommendations:

1. A mill test should be made of the low grade ore to determine the most economical method of extracting the maximum values at a minimum cost. A general average shows the low grade ore to contain 8 to 9 per cent lead and one to two ounces of silver in the Martinez after the large pieces of cerussite and galena have been removed. There are also bunches of iron stained silicious rock that breaks course in blasting and carrying very little value. Therefore, by installing a suitable grizzly and sorting platform, a large amount of this waste rock could be eliminated and at the same time sort out the high grade ore. This would not only increase the value of the high grade ore shipment but would build a stock pile of higher grade milling ore. I would recommend the sinking of the present Martinez shaft on the vein 100 feet and drift on the vein north and south 600 feet, at the present time. The estimated cost of this work would be $50.00 per foot on shaft sinking and $10.00 per foot on drifting, which totals $11,000.00 and as the work would be done in the vein, the grizzly and sorting platform should be installed so that all the material from the work could be put through the grizzly and over the sorting platform. By using a one inch screen through which the fines would pass, would clean the ore to a large extent and permit closer hand-sorting and eliminating a large amount of waste rock The waste can be rejected through one chute and the high grade shipping ore pass through another chute and into an ore bin.

2 2. The galena and cerussite occur in pieces from the size of a hen's egg up to nail kegs and larger, therefore, I feel quite sure that from approximately 2,000 tons of material from the hundred foot shaft and 600 feet of drifting, 10% or 200 tons of shipping ore with a value of about 30% lead, netting approximately $30.00 per ton at a total value of $6,000 could be recovered. During the development work, some 1,000 tons of milling ore assaying from 8 to 9 per cent lead can be accumulated. The estimated cost of installing the grizzly and sorting platforms and of the shutes, bins, and a Pontiac hoist, now in storage, would be around $1,5000. It may be well to mention here that at the 300 foot level, the Martinez shaft should develop a greatly increased volume of water, which would permit the operating of a much larger mill.

3. It would be advisable after the grizzly and sorting platform has been installed and work started on the shaft, a general overhauling of the present mill, also the installation of two concentrating tables to follow the flotation. This would permit much coarser grinding with increased mill capacity and a combined recovery of better than 90% of the lead and silver values according to laboratory tests.

4. It would be advisable to construct a new bunk house and cook house and equip them with modern equipment. An estimated cost of overhauling the mill including a new fuel tank, two concentrating tables, with cook and bunk house and equipment would be aroung $6,000.

5. The mill handling 1,000 tons per month of 6% lead ore recovering 90% of the values, would produce approximately 166 tons of concentrate running 40% lead or better, and the net values from smelter of $44.00 per ton totaling $4,400. This added to the shipping ore would equal $11,704.00 per month, net from smelter and with approximate operating profit of $5,000. After the shaft has been sunk another one hundred feet, I would suggest drifting on the vein, north 400 feet and south 200 feet, as outlined on drawings Y and Z, marked in red. This would develop a block of some 18,000 tons of ore.

6. After the work as outlined in paragraphs 1 to 5 has been completed and the mine and mill in operation and after sufficient water has been developed to justify, I believe that the profit from the operations will pay all costs of the developments as outlined in this paragraph. A mill with a capacity of 100 tons daily or 3,000 tons per month, should be the next move. I would advise also, driving a cross-cut west 300 feet to the center of the House claim. This would cut the Martinez vein approximately 800 feet south of the Old Glory Hole workings. A close estimate of the amount of work necessary to properly connect the two mines is shown on drawing Z, marked in blue, lettered from A to I. This operation should make accessible thousands of tons of high grade milling ore as throughout the Old Silver Bell and Columbia workings, only the high grade shipping ore was taken. Work can be carried on at the Columbia-Silver Bell while the north drift in the Martinez is being driven, to a point just north of the mill where the permanent working

shaft is located. This is shown on drawing Z, marked with the letter C. This would permit a gravity feed to the mill, al to the high grade ore bins and provide plenty of room for waste disposal. By connecting the Martinez with the Columbia-Silver Bell workings, ample ore would be easily accessible for large operations. Mr. T. S. O'Brien, who is at present in charge of the Silver Bell-Martinez, is fully in accord with the above mentioned recommendations. In fact, part of my recommendations are based on the joint conclusions of Mr. O'Brien and myself. I would like to quote an extract from E. B. Starbird regarding the Columbia-Silver Bell and Martinez mine. Quote:

"Five weeks spent in a thorough examination, careful and systematic sampling and the use of conservative figures has established the following facts:

Ore in sight, blocks opened on two, three, and four sides, samples every ten feet,

Columbia-Silver Bell mine, Blks	58,807	tons	$639,115.00
Martinez Mine "	6,083	"	102,484.00
	64,890	tons	$741,599.00
Columbia-Silver Bell Mine, dumps	12,536	tons	236,410.00
Martinez Mine "	910	tons	18,014.00
	78,336	tons	996,023.00"

Unquote.

MEMORANDUM OF ASSAYS FOR THE MARTINEZ MINE

All samples listed below was personally taken during the course of my examination. Please refer to the longitudinal drawing marked X attached to the back of this report. Samples A-1 to A-9 were taken above the lower level. Samples B-1 to B-3 taken at different places on the lower level; D-1 to D-18 was a systematic sampling of the Martinez shaft. Letters and figures A-1 to D-18, in circles, show position of samples taken; all were average channel cuts.

The lateral drawing marked Y, also attached to the back of this report will show the angles of the lower level and the incline shaft in the Martinez. Drawing Z shows the five claims, the position of the old workings and the relative position of the Martinez to the Columbia-Silver Bell and the drifting and raising necessary to connect the two mines, most of which will be on the vein.

MEMORANDUM OF ASSAY FOR MARTINEZ MINE

No.		Silver, oz		Lead %		Copper %	Width
	A-1	"	1.05	"	11.5		72 Inches
	A-2	"	3.20	"	14.4		33 "
	A-3	"	1.00	"	4.2		61 "
	A-4	"	1.10	"	11.6		60 "
	A-5	"	0.80	"	5.2		58 "
	A-6	"	0.80	"	6.4		50 "
	A-7	"	0.60	"	6.1		60 "
	A-8	"	0.40	"	0.9		62 "
	A-9	"	1.80	"	23.2		60 "
	B-1	"	1.25	"	13.6		96 "
	B-2	"	1.30	"	7.3		56 "
	B-3	"	2.80	"	30.6		24 "
	C-1	"	0.70	"	1.1	" 1.85	60 "
	D-1	"	1.05	"	11.5		72 "
	D-2	"	0.90	"	5.9		57 "
	D-3	"	0.90	"	10.3		56 "
	D-4	"	0.95	"	11.8		56 "
	D-5	"	0.80	"	3.3		49 "
	D-6	"	0.70	"	2.1		44 "
	D-7	"	1.05	"	1.1		50 "
	D-8	"	0.85	"	15.45		46 "
	D-9	"	0.80	"	11.7		48 "
	D-10	"	0.95	"	8.1		56 "
	D-11	"	0.90	"	5.6		53 "
	D-12	"	0.90	"	7.7		46 "
	D-13	"	1.10	"	17.1		47 "
	D-14	"	0.75	"	10.2		41 "
	D-15	"	0.95	"	5.15		63 "
	D-16	"	0.90	"	6.6		38 "
	D-17	"	00.80	"	11.5		32 "
	D-18	"	0.85	"	1.1		45 "

By T. Lee Boyer
Assayer

CONCLUSIONS

My conclusions are: The property of the Silver Bell-Martinez is situated favorably as to transportation facilities; working conditions are favorable and skilled labor may be obtained in the district. Geological conditions are favorable for the deposition of the metal solutions.

In conclusion, I wish to say that this is a very remarkable property, the size of the ore body carrying good values so near the surface which most mining camps find it necessary to sink several hundred feet to obtain.

The fact that the ore is of a high sulphide indicates persistency and great depth and the fact that this mine can be operated at a profit on the current base prices of metals without taking into consideration the premiums. I do not believe that the most exacting engineer could find fault with his opportunity here. All main factors lend every encouragement toward the making of a profitable producing mine. I can without reservations recommend this property.

Respectively submitted

L. Lee Boyer

L. Lee Boyer, Reg. Assayer and
Con. Engineer

GEOLOGY
OF THE SILVER BELL-MARTINEZ
PROPERTY

Mineral Creek Mining District

Pinal County, Arizona

by

JOHN D. CHAKARUN

Geologist

Tucson, Arizona

May, 1974

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ILLUSTRATIONS

INTRODUCTION

This report is written for and is directed to John C. Munson and the other heirs and heiresses of the George F. Bont estate. This report is not intended to be a promotional device, but is written to inform you of the geologic nature of the Silver Bell-Martinez property and its economic potential.

Ten days were spent examining and studying the geology of the area. Data from the following older reports was extracted and used where applicable to this study:

H. B. Starbird	1920
E. A. Collins	1934
A. Glas	1937
L. L. Boyer	1943
R. E. Mieritz	1957

Of greater help to me than the reports was the accompaniment of Pete Villaverde who has mined and been caretaker of the property on an intermittent basis since 1946.

Twenty-seven claims, comprising about 450 acres, make up the Silver Bell-Martinez property. Patented claims are as follows:

Silver Bell	(Survey 314)	April 18, 1890
Columbia	(Survey 315)	April 18, 1890
Martinez	(Survey 799)	Jan. 10, 1891

Unpatented claims include the following:

Aspen	Cave No. 3	Good Luck No. 2
Aspen No. 2	Columbia West Ext.	Good Luck No. 3
Aspen No. 3	Copper King	Good Luck No. 4
Cave	Flunk Out	Good Luck No. 5
Cave No. 2	Good Luck	House

Lorado
Lorado No. 3
Over Sight
Over Sight No. 2
Silver Bell West Ext.

Silver Pick
Silver Pick No. 2
Silver Pick No. 3
Silver Pick No. 4

Figure 1 shows the layout of most of the claims.

LOCATION AND ACCESSIBILITY

The Silver Bell-Martinez property is located in Pinal County, Arizona, 19 miles by road N. E. of Florence, in Sec. 18, T. 3 S., R. 12 E., and lies in the Mineral Creek Mining District. The Southern Pacific Railway is eight miles by road and five cross-country miles south of the property (Fig. 2).

TERRAIN FEATURES

In spite of the relatively low elevation (2,500 to 3,484 feet) the terrain is very rugged. Spires and spines of reddish to maroon rhyolitic lavas, flow breccias and indurated volcaniclastics are flanked by deep canyons and sharp ravines. Cliffs, caves and natural arches are locally present. Martinez Canyon, the main drainage route for the area is studded with large cottonwood trees.

FACILITIES

The property is equiped with a comfortable two-bedroom house and an adjoining work shop. The house has a good water well, water storage tank, and indoor plumbing. In the kitchen are a stove and a refrigerator that run on bottled gas. Flat ground adjacent to the house is available for tents, trailers, or cabins.

HISTORY AND PRODUCTION

The Silver Bell-Martinez property was discovered in about the year 1880 whereupon shipment of high grade silver-lead ore began from the Silver Bell Mine to a smelter on the Gila River. Some $1,000,000 in ore is said to have been mined between the years 1880 and 1883. Later, the Martinez Mine was opened and high grade lead-silver ore was extracted.

No records are available for production in the earliest years, but the following records were found:

Martinez and Silver Bell Mines 1937-38 2,353 tons averaging 4 oz Ag and 5.3% Pb.

Silver Bell Mine 1938-40 1,637 tons averaging 18 oz Ag and 7.5% Pb.

Martinez Mine Production

Producer	Type	Tons	oz Ag	% Pb	Pb Price
Calif. Steel Prod.					
Year 1943	Ore	345	1.2	14.4-24.3	6.5¢
1944	Ore	424	.4-19.8	8.0-26.0	6.5¢
1945	Ore	280	.7- 4.6	11.6-20.8	6.5¢
1945	Conc.	34	1.7	54.0	6.5¢
1946	Ore	52	1.0	20.0	8.109¢
1946	Conc.	30	2.0	53.6	8.109¢
Martinez-Bell Mining					
Year 1948	Ore	21	1.5	23.5	18.04¢
United Ariz. Mines					
Year 1951	Ore	243	2.0	19.3-34.7	17.50¢
1951	Conc.	66	2.5	42.9-58.3	17.50¢
1952	Ore	42	2.3	27.0-37.7	16.467¢
1952	Conc.	30	1.9-4.1	47.7-57.3	16.467¢

ORE STRUCTURES AND MINERALIZATION

The host rocks for ore structures and mineralization consist of an intermixed pile of buff, red, and maroon lavas, flow breccias, plugs and indurated volcaniclastics. Rock unit attitudes are varied and individual units discontinuous rendering it difficult to project rock types for any great distance. The time factor did not allow for the detailed mapping of these rock units, and I feel that to do so would not have contributed materially to the outcome of this report.

Mineralization in the Silver Bell and Martinez mines resulted primarily from the open-space filling of ore structures that were created by faulting. The volcanic rocks are broken by a number of large faults and by numerous smaller ones that strike northerly and have near-vertical to steep westerly dips. Repeated movement along these faults has given rise to rhyolitic diking and the brecciation of mineralized zones.

The Silver Bell Mine and its southerly counterpart the Martinez Mine appear to occupy parts of the same structural zone although it is not at this time possible to relate the two to a single common fault (Fig. 1). A post-mineral white rhyolite dike has penetrated the ore zone in both mines and commonly forms the hanging wall of the workings.

Ore mineralization at both mines consists primarily of the lead minerals galena (PbS), anglesite ($PbSO_4$), and cerussite ($PbCO_3$), and the silver mineral cerargyrite (AgCl). Minor amounts of pyromorphite $[Pb_5\ Cl(PO_4)_3]$ and mimetite $[Pb_5\ Cl(AsO_4)_3]$ are present. It is quite possible that some of the rich near-surface silver ores in the Silver Bell Mine contained acanthite--the low temperature, supergene analogue of argenite (Ag_2S). Fluorite and barite are fairly abundant, and sphalerite has been reported. Minor amounts of the copper oxides chrysocolla and turquoise are present, but no copper sulfides were found.

THE SILVER BELL MINE

Due to the inaccessibility of the Silver Bell Mine at the time of this writing, my description is the result of a surface examination along with extraction from and sorting of pre-existing data. According to Starbird (1920) there are 4,336 feet of development work in the mine (Fig. 3). Most of the workings are in the mineralized fault zone with the exception of about 450' of adit which is in country rock.

The fault zone containing the majority of the Silver Bell workings strikes N15°E and dips 52° west. An excellent outcrop is visible at the glory hole (Fig. 3). Here, a smooth, planar hanging wall of white, spherulitic, rhyolite dike rock is adjacent to a red breccia-gouge zone. The dike is a minimum of 50 feet thick and the gouge zone is about 15' thick. On the east side of the gouge there is about 150' of crackled rhyolite country rock that carries fracture coatings of barite. In addition to the visible barite, a

rock chip sample of the crackled rhyolite showed 790 ppm Pb, 790 ppm Zn, and 4 ppm Ag.

The breccia-gouge zone tapers and becomes a crackled, iron-stained zone within 300 feet north or south of the glory hole. About 500 feet south of the glory hole the same (?) dike is only a few feet thick and flow-banding indicates a N-S strike and 70° westward dip. Mineralization here is negligible. The adjacent crackled, Fe-stained rhyolite shows 410 ppm Pb, 290 ppm Zn and no Ag.

The glory hole was the place of discovery for the Silver Bell Mine. Here, large "goose eggs" of massive galena up to three feet in diameter are visible and appear to be "floating" in a breccia-gouge of red, finely divided country rock and limonite. A sample of this gouge with no visible galena ran 7.4% Pb, 2.1% Zn and 85 ppm Ag. The large galena "goose eggs" are encrusted with concentric bands of anglesite and in places are altered to cerussite and yellow lead oxide. Black cindery layers several inches thick and adjacent to the hangingwall were exploited in the early days for their very rich silver content. Remnants of these layers can be seen adjacent to the "stope to surface" (Fig. 3).

Based on detailed sampling at ten-foot centers, Starbird (1920) calculated that there were about 58,807 tons of ore in sight in the Silver Bell, and a possible ore tonnage of 232,170. The areas sampled and the average values can be seen on Figure 3. In averaging his samples I noted that they were not erratic, but fairly consistant—evidence of

good, conservative sampling techniques. Rich "kidneys" of ore encountered in the workings and referred to by previous writers are probably the same massive galena "goose eggs" that occur in the breccia gouge. Starbird did not sample these! Therefore, any high-grade ore encountered in mining will be a bonus in addition to the calculated results. Less than 2,000 tons of ore have been mined since Starbirds sampling was completed, and most of this came from the surface excavation of the glory hole.

THE MARTINEZ MINE

Nearly all of the drifts, winzes, and stopes are accessible down to the 200 foot level of the Martinez Mine. However, the 200 foot level contained about six feet of water and therefore could not be investigated at the time of this writing. Figure 4 is a plan view of the Martinez Mine.

Most of the drifts, as well as the main haulage shaft, were developed in high-grade lead ore. As a result, pillars of ore had to be left behind for safety reasons and can still be seen throughout the mine. Like at the Silver Bell, the hanging wall is well defined in the ore zone and is characterized by a white post-mineral rhyolite dike. Here, however, the dike is generally less than 3 feet thick and is tuffaceous, containing many breccia fragments and pieces of mineralized vein material. The footwall is poorly defined and local undulations have allowed the ore zone to thicken from four to 12 feet.

These undulations are partly visible in outcrop on the south edge of the main shaft.

The ore zone consists primarily of brecciated, silicified, rhyolitic country rock that has been impregnated with a stockwork of galena veinlets. Entirely unexpected from surface exposures were the room-sized "molars" of massive galena that were encountered by early miners in stopes one, two, and three (Fig. 4). The ore zone visible at the surface near the main shaft dies out southward into a crackled and poorly mineralized country rock. Five-hundred feet north of the main shaft one can see two vein-fault traces on the ridge slope (Fig. 5). Both of these vein-faults are mineralized. The decline at the north end of the Martinez Mine lies in the plane of the lower-angle vein-fault, striking N5°E and dipping 43° west. This lower-angle vein-fault continues for at least 1,000 feet over the ridge top where it is exposed in the floor of Martinez Canyon. The higher-angle vein-fault strikes N-S and dips 53° west.

I believe that the intersection of the two vein-faults was primarily responsible for the opening of a structural zone receiptive to ore depositing solutions. The ore zone appears to have a northward rake of about 25°, beginning in the vicinity of the main shaft and continuing below the decline of Figure 5.

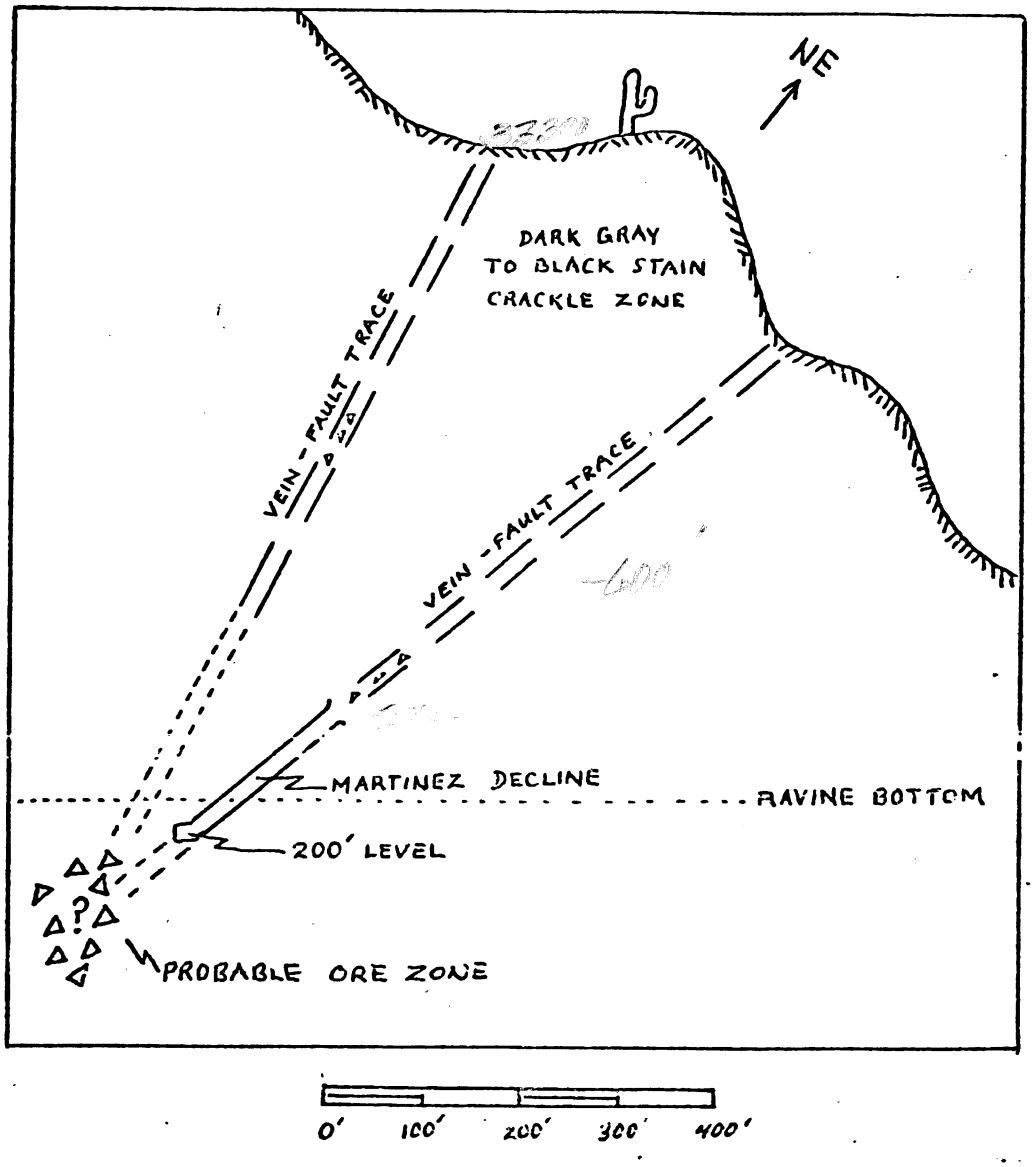
ORE POTENTIAL AND RECOMMENDATIONS FOR FURTHER EXPLORATION

The greatest ore potential appears to be held by the Silver Bell Mine, where silver values are high, fairly consistent, and seem to be continuing at depth. According to Glas (1937) there is a zone of 40 oz. ore at the south end of the 400-foot level. If the present water table is any indication of the lower limits of supergene enrichment, then high-grade silver zones can probably be encountered at still deeper levels. Pete Villaverde inspected the mine several years ago and found it completely dry. The well-defined fault zones required a minimum of timbering and the drifts were in good shape. Pete will have the "stope-to surface" opened up enough for entry in the next few weeks.

Based on the conservative sampling by Starbird (1920), the minimum ore tenor in the Silver Bell is about 6.9 oz. Ag/ton and 1.4% Pb. At todays price of about $6.00 per oz. for Ag and 21½¢/lb for Pb, the ore should have a minimum value of $47.40/ton.

Starbird's estimate of 58,807 tons of ore in sight minus about 2,000 tons mined since 1920, would leave approximately 56,800 tons in sight. At $47.40/ton this ore would have a metal value of about $2,700,000. Additional values in gold, zinc, barite and fluorite may be realized.

Once access is obtained to the Silver Bell, and the ores spot-checked for their soundness, I would recommend drilling



SCHEMATIC OF THE MARTINEZ VEIN - FAULT STRUCTURE

Figure 5

to test the values at greater depths. Slant-holes should be core-drilled from the surface, perpendicular to the fault-vein structure. The fact that the ore zone rakes to the south in the Silver Bell should be taken into consideration. This zone probably results from intersection of the breccia-gouge zone seen at the surface with a more vertical fault zone encountered at depth. The collar of a slant-hole of unknown depth is present near the glory hole of the Silver Bell Mine. However, this hole slants away from the mineralized structure and could not have possibly intersected it!

The northward rake of the ore zone in the Martinez Mine was not taken into consideration during the original development work. The horizontal 200-foot level follows closely the lower-angle vein-fault as it continues northward to meet the decline, but shys away from the zone of vein-fault intersection. Therefore, I believe that the decline has stopped short--perhaps within a few tens of feet of the ore zone. Pete Villaverde has offered further evidence of this hypothesis. In the bend of the last northerly leg of the 200-foot level he found a maroon gouge that assayed 14 oz Ag/ton. Also, lead was found in a short probe-sample of the near-by hangingwall (Fig. 4). No follow-up was done of these testing results. While mining, it was customary to keep the development work on the foot wall side of the white rhyolite dike. However, because this is a post-

mineral dike, it is possible that the ore zone could have been divided by it.

The Martinez Mine area should be drilled. Testing of the proposed extension of the ore zone below the decline can be done in one of two ways.

1) A short slant-hole can be drilled parallel to the low-angle vein fault from the bottom of the decline.

2) A deeper, easterly-slanting hole can be drilled from the west side of the veins.

The possibility of division of the ore zone by the post-mineral dike is reason enough to suggest that the hangingwall should be probed to test the dike's hidden side, especially on the 200-foot level.

In conclusion, I believe that the Silver Bell-Martinez property looks good and can probably be made to "come alive" once again. The Silver Bell Mine has considerable underground development work already done and ore could probably be shipped with little additional development. However, to fully realize the ore potential here, drilling should be done in an effort to expand the "ore in sight". The Martinez Mine has to be drilled and extensively developed before any ore can be taken out.

Follow-up Report on the Sillver Bell Mine
Mineral Creek Mining District
Pinal County, Arizona

by

John D. Chakarun

February 1975

INTRODUCTION

This report was written at the request of Russell Twiford, Jr., and is directed to Polaris Mining Company. Five days were spent studying the mineralization of the Silver Bell mine in an effort to help set forth guidelines for the immediate extraction of ore.

The old workings of the Silver Bell are now accessible and it was possible to gain a better understanding of the vein structure and ore-bearing zones within. The Silver Bell consists of about 5,000 feet of development work along with minor stoping. After a quick examination of the entire mine, I decided to concentrate my efforts on the most northerly end of the old workings. It is at this end where the highest grade outcrops of vein material were exploited by the early mines.

The old workings at the north end were mapped with tape and brunton, this being accomplished with the assistance of Pete Villaverde, Sr. and Pete Villaverde, Jr. Channel samples were cut from selected areas as shown on the attached plat. The muck-filled original discovery shaft is partly exposed in the face of the open-cut (see plat). The muck-covered floor of the open cut is at a level about 15 feet above the north entrance to the mine.

SAMPLING RESULTS

The highest grade sample (SB-2) came from a 3 foot pillar that was left at the south end of the old stope shown in the plat. It ran 43% Pb and 64.35 oz Ag/ton. Cerussite is the most abundant ore mineral visible. Hazardous conditions prevented the examination of both the north end of this stope and its continuation to depth, which is estimated at 150 feet below the drift (see plat). The Pb-rich fault zone along which the stoping was done appears to die out southward into a reddish gouge and brecciated zone containing little visible mineralization. However, as shown by the following samples, this red zone does carry significant values. Samples SB-3 and SB-4 were cut from a 3 foot width above, and a 4 foot width below the planar fault surface. These samples contained 7.23 and 9.48 oz Ag/ton, and 9.7 and 1% Pb, respectively. Twenty-five feet farther south along this structure samples SB-8 and SB-9 showed an average of 4 oz Ag and 4.6% Pb over a combined width of 6 feet.

The hanging wall of the stoped area is mantled with a white-to-pinkish, kaolinitic gouge not more than 3-4 inches thick that contains patches and disseminations of finely-crystalline metallic gray and transparent minerals. One sample of this material (SB-1) contained 9.62 oz Ag/ton.

The present open-cut trends N-NW and was excavated on a surface exposure of a breccia-gouge zone that strikes N-NW

and contains "goose eggs" of massive galena as large as 3 feet in diameter. This zone is separate from the one that was stoped within the mine. A highly siliceous, crackled, green rhyolite is exposed across a 20 foot width of the face of the open-cut. The rock is impregnated with an abundance of stringers and lenses of grayish-black, dense, sooty "wad". A 6 inch wide stringer of this material (SB-5) containing visible Hemimorphite, Hydrozincite, and Barite ran 16.39 oz Ag/ton, 8.3% Zn, and 1.4% Pb. A 40 pound sample (SB-6) taken across the face ran 11.79 oz Ag, 3.2% Pb, and 3.1% Zn. This green crackled rock appears to have a more vertical aspect than does the adjacent maroon breccia-gouge zone, and may be quite large in the form of a plug, lens, or pipe-like body.

MINERALOGY

Ore minerals that have been identified in the mine by this writer include the following:

Galena	PbS
Cerussite	$PbCO_3$
Anglesite	$PbSO_4$
Massicot	PbO
Hemimorphite	$Zn_4 (Si_2O_7) (OH)_2 H_2O$
Hydrozincite	$Zn_5 (OH)_6 (CO_3)_2$
Barite	$BaSO_4$
Fluorite	CaF_2

No silver minerals have been positively identified. The light color of the pillar material (SB-2) combined with its high Ag value suggests that the Ag minerals accompanying the cerussite may be one or more of the halides Cerargyrite (AgCl), Embolite (AgBr), or Iodyrite (AgI). The very fine-grained metallic gray crystals found on the hanging wall (SB-2) may be Argentite (Ag_2S) formed as a result of supergene processes. No primary silver sulfides were found. Manganese oxides were suspected to comprise a large portion of the "wad" (SB-5). However, Mn represented only 360 ppm. Also, the V_2O_5 content was negligible, thus eliminating the black oxide Mottramite ($PbCu\ VO_4\ OH$). It is suspected that Plattnerite (PbO_2) is the primary black constituent in the "wad".

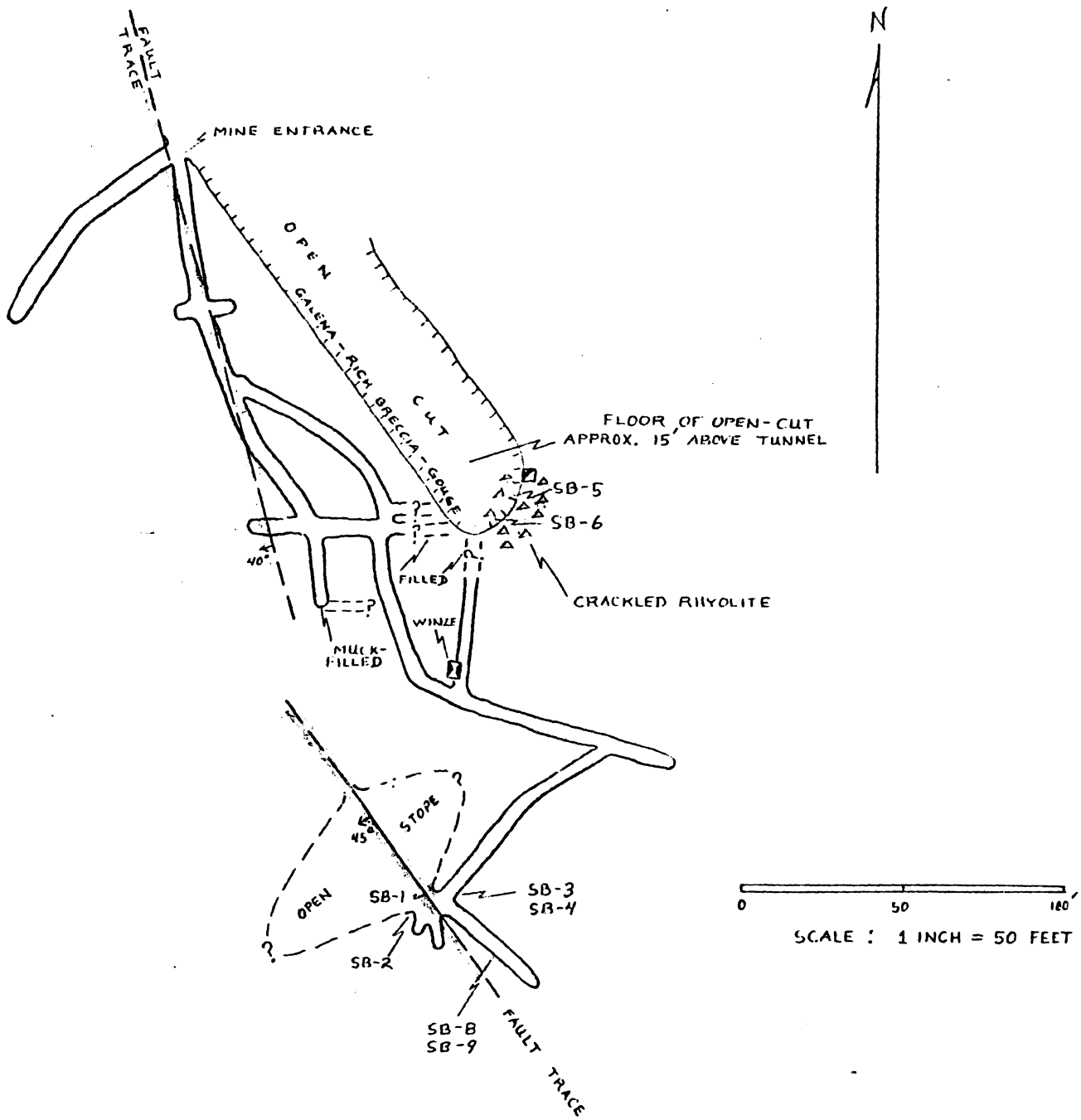
CONCLUSIONS

The sampling results have shown that the silver values are not necessarily highest in the areas where black oxides are prevalent. This is important because much of the mine contains maroon breccia-gouge zones that appear economically lean, but which may prove to be worthy of exploitation. Much of the drifting in the southerly portion of the mine is in this type of material.

Ore-grade rock containing about $92/ton in combined Ag-Pb-Zn values is readily available at the surface in the open-cut. Additional values in barite and fluorite may also be realized. The extent of this body is unknown and can only be proven by additional excavation and/or drilling. I suggest a lowering of the 50 foot bluff which overhangs the open-cut so that the open-cut can be safely dropped at least 15 feet. This will allow better exposure of the ore zone and a better understanding of the complex structures involved. Also, when the open-cut is dropped, a short-cut access route will be opened through which additional ore may be trammed from the vicinity of the stope.

The most obvious and perhaps the most important observation that resulted from this study is the fact that no vestige of the original galena-rich vein could be found in the mine. All of the stoping and much of the drifting have been done along post-mineral faults that carry brecciated vein material and fault gouge. This means that much of the ore that was

previously mined may have been carried along faults that intersected a larger, more continuous vein structure, remnants of which remain to be discovered. Prior to any underground mining, these faults should be studied in an attempt to determine the type of movement that has occurred along them.



PLAN VIEW OF THE NORTH END OF THE SILVER BELL MINE

MINERAL CREEK MINING DISTRICT

PINAL COUNTY, ARIZONA

by

JOHN D CHAKARUN

FEBRUARY, 1975

Jct. Left 2049.8 → 2053.2 (9.4) — 3.4
Turn off 2053.2 → 2059.2 — 6.0 No Rt.
Jct left. 2059.2 → 2059.9 — 0.7 No Lt.
Rt 2059.9 → 2063.9 (6.0) — No Rt.
Jct. Lt. 2063.9 → 2065.9 — No Rt,
Jct Lt 2065.9 → 2066.4 — - Rt Corral,
2067.2 — 1.3 to Camp.
17.4

166.0 → 169.8 (10.4) — 3.8
169.8 → 176.4 — 6.6
176.4 → 177.1 — 0.7
177.1 → 181.6 (8.2) — 4.5
181.6 → 185.3 — 3.7

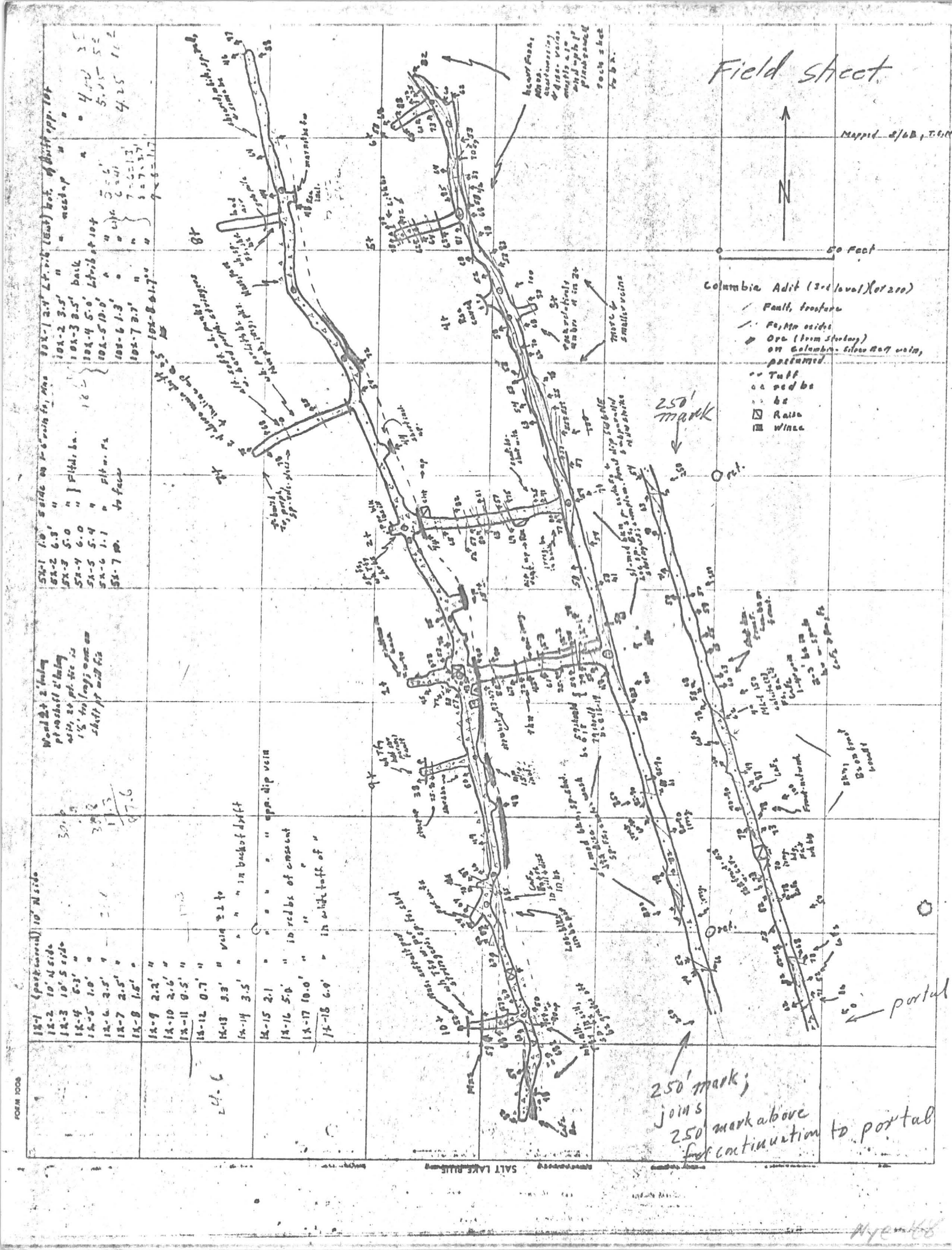
19.3
3.8
15.5 15.6

N 65° E — 1500' ± to 7/18 | 8/17

1656 — 4'-8½ Sta. wash high S. Wall.
1657 5' " " 4'-9' " " " "
1658 5' " " 9-14 " " " " to HW.
1659 5' " " 14-19 " " " " in HW
1660 6' So Dr No 3 hv. @ #6 FW. up to fault.
1661 6.5 " " " @ #10 FW in E. Wall.
1662 6.0 " " " @ #15 FW in E Wall
1663 — 4.0 E Wall of Xcut to SH - FW to E - FW-4' 58'
1664 6.0 N Wall " " " 4'-10' ft.

64.27'
3-1-8-2

R. E. MIERITZ

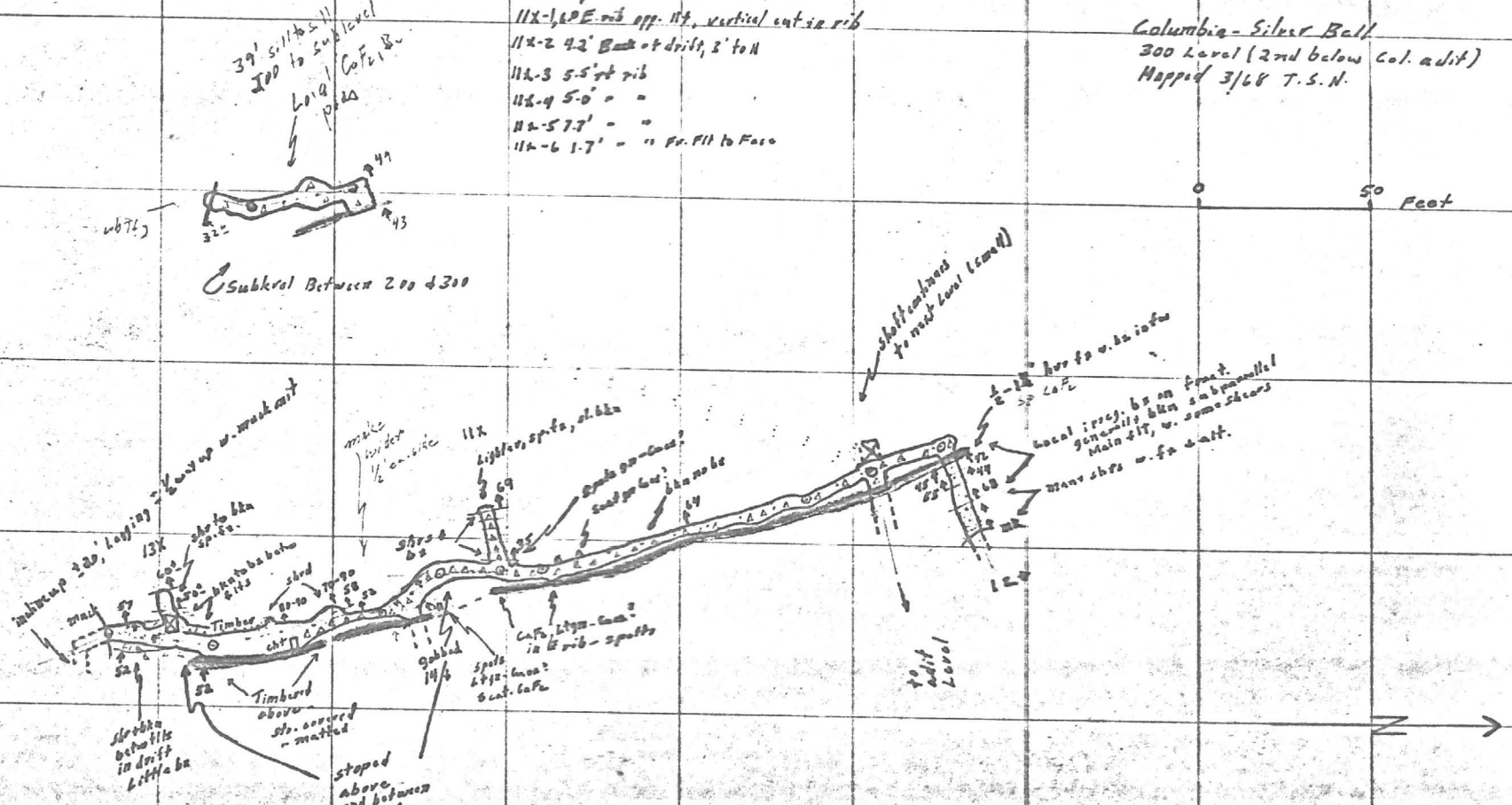

Field Sheet
Mapped 8/68 by T.G.M.
N
50 Feet
Columbia Adit (3rd level)(or 200)
Fault, fracture
Fe, Mn oxides
Ore (from stoping) on Columbia-Silver King vein, presumed
Tuff
red bx
bx
Raise
Winze
250' mark
250' mark; joins 250' mark above for continuation to portal
portal
SALT LAKE BLUE

FORM 1006

Field Sheet

Columbia - Silver Bell
300 Level (2nd below Col. adit)
Mapped 3/68 T.S.N.

SALT LAKE BLUE



13ft winze down ± 20'w. short (15'±) drift to N and ±10' incline up @ end of N drift

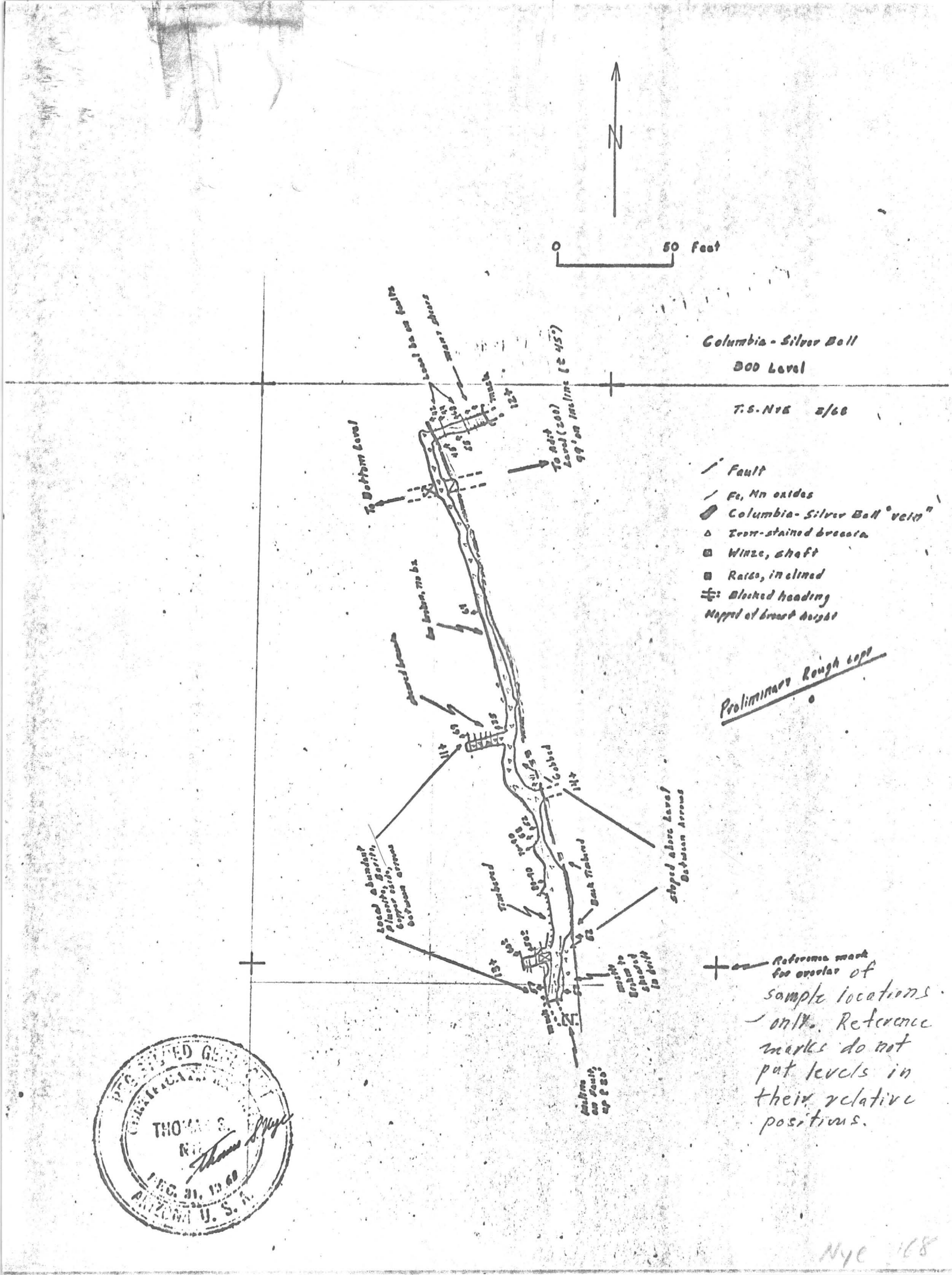
81E 24' incl

vein	Minerals present
	Calcite
	CaF_2
	Barite
	$CaCO_3$
	Jarosite
	Mn ox
	Fe ox
	Anglesite
	Qtz
	Galena

12X-1 8.6' hw Ltrib
12X-2 10.0 fw Ltrib
12X-3 10.0 fw Lt. rib
12X-4 N.S.

/ Fault
Fe, Mn oxides
A Fe ox bx (red)
Presumed ore on fault, Columbia - Silver Bell vein
Winze, shaft
chute
blocked working - gob, muck

N42 168



THOMAS S. NYE
DEC. 31, 1968
ARIZONA U. S. A.

NyC 168

N

0 50 Feet

Columbia Adit (200 Level)
T.S. NYE, 2/68

Fault

Fe, Mn oxide

Columbia-Silver Bell "vein"

Iron-stained breccia

Breccia

Raise

Winze

Mapped at breast height

reference mark for overlay

Preliminary Rough copy

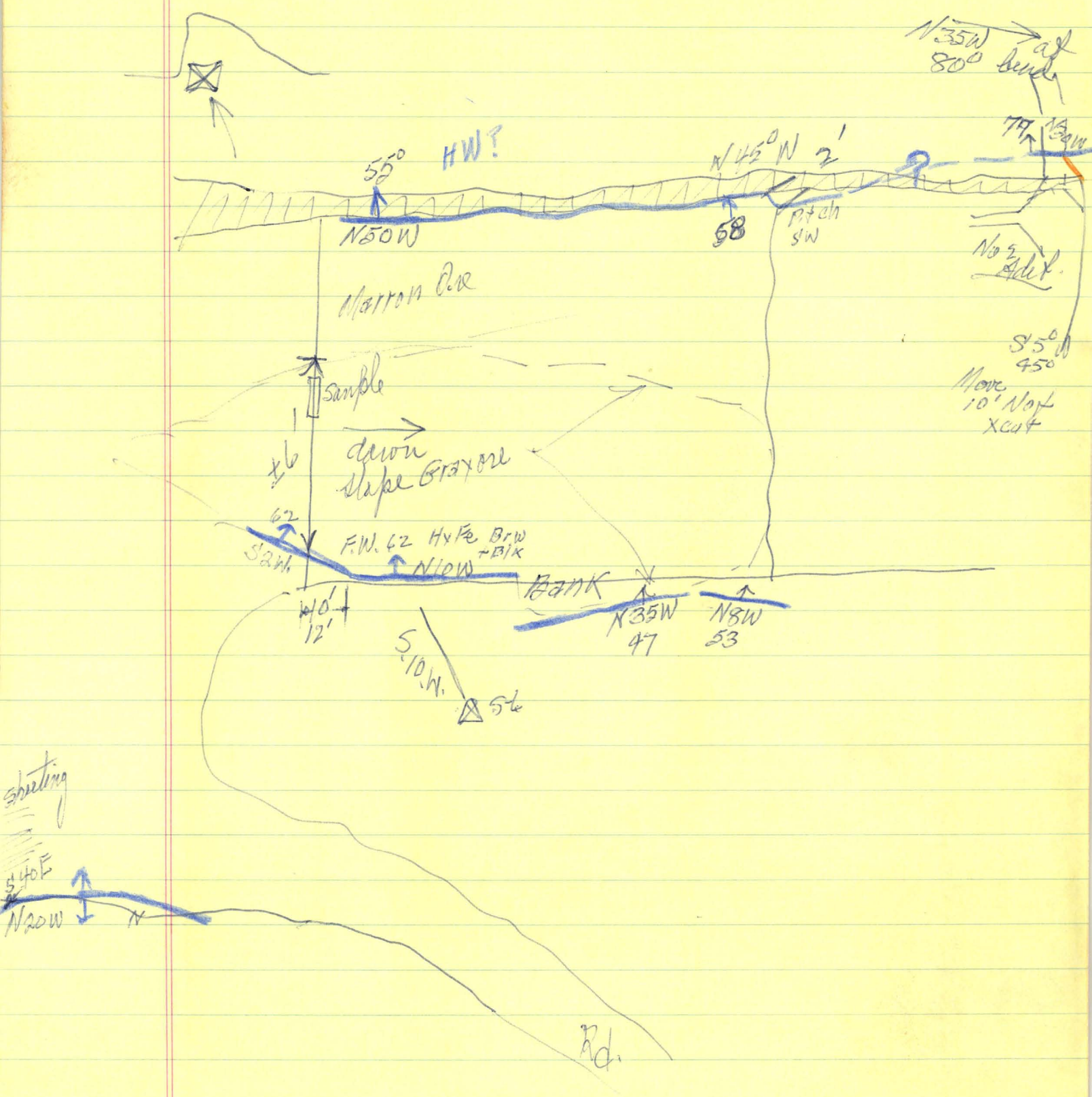
approx. location of sill, 300 level, on inclined shaft

REGISTERED GEOLOGIST
CERTIFICATE EXPIRES
THOMAS S. NYE
DEC. 31, 1968
ARIZONA U. S. A.

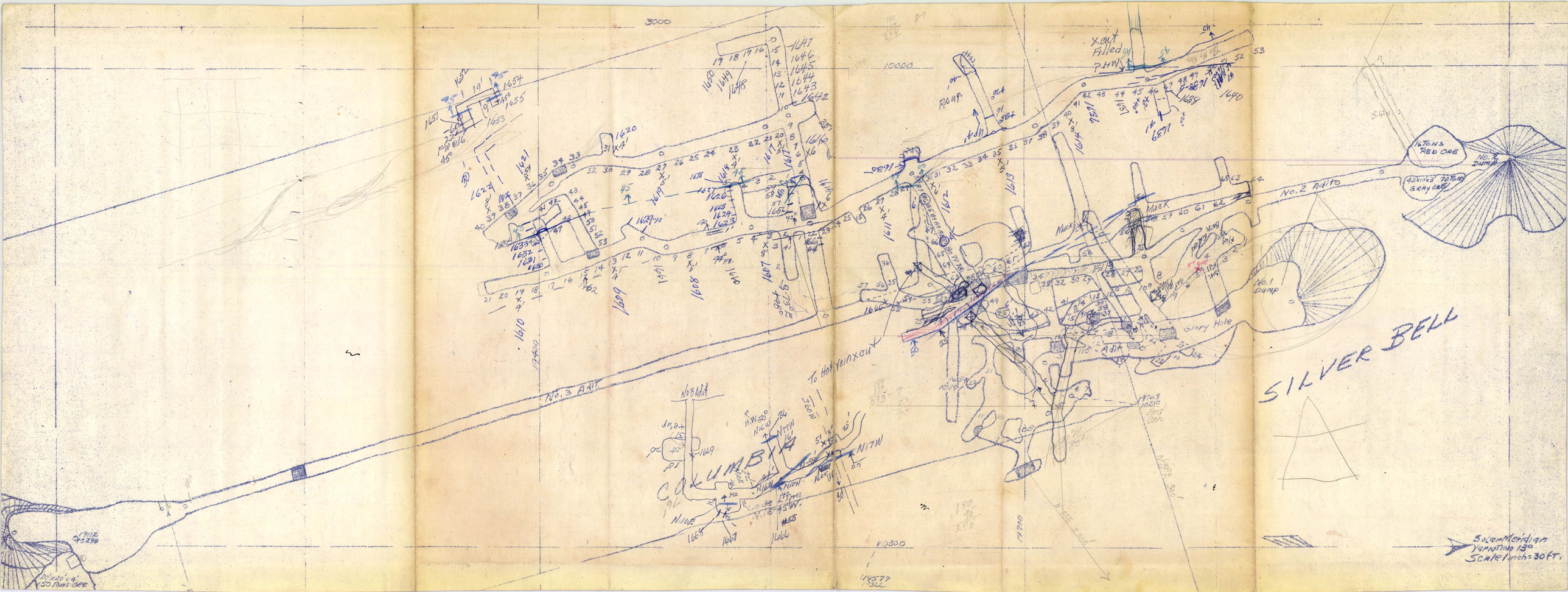
N77E

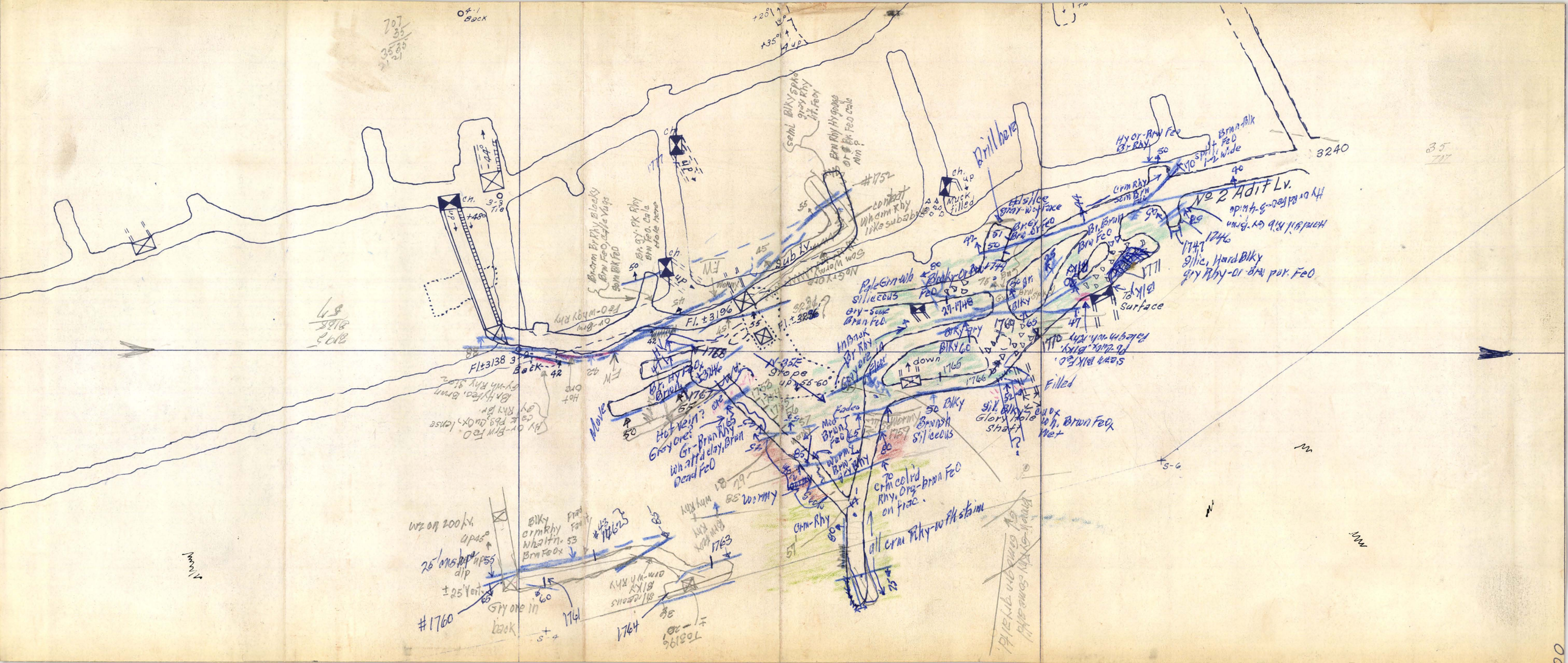
N21W

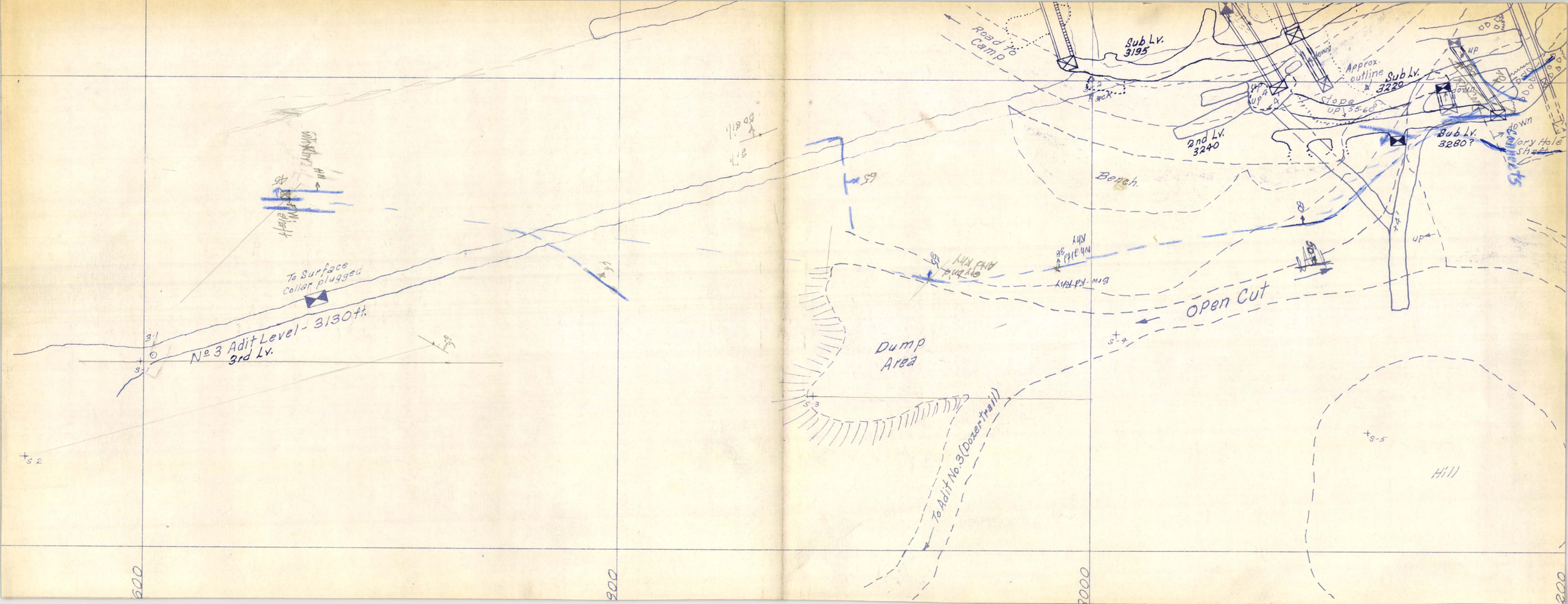
85-177

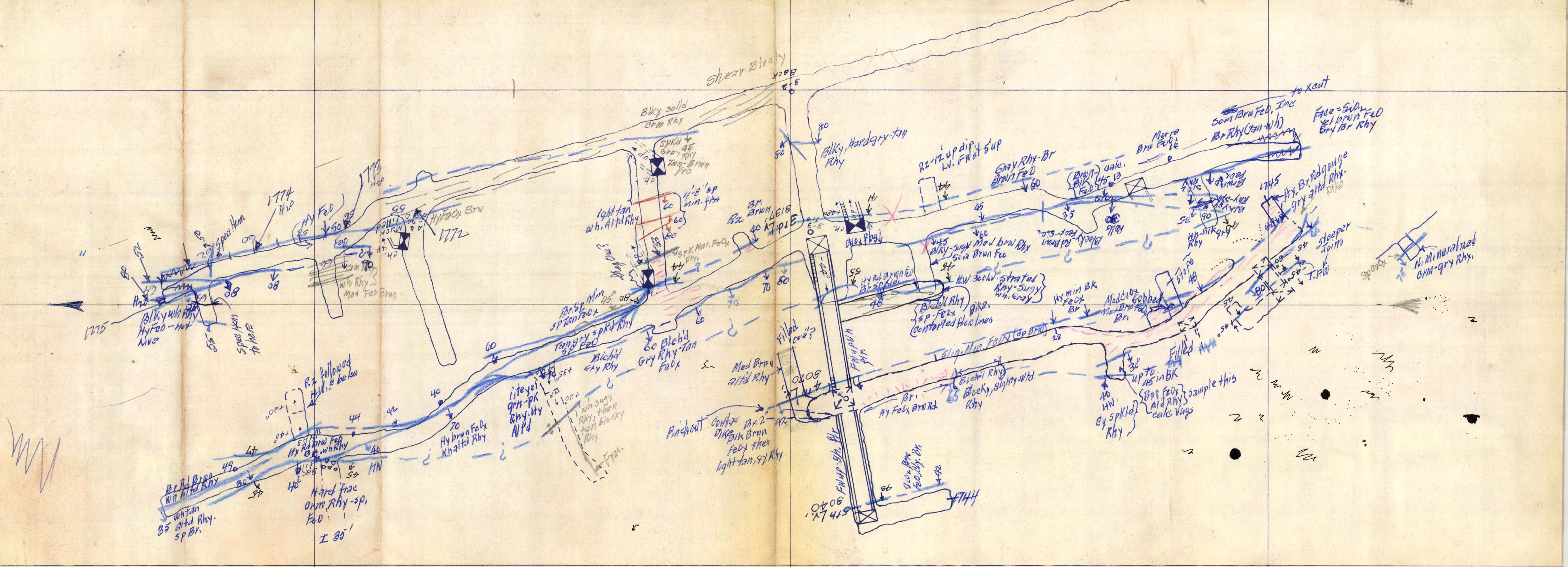


pump - ½" head - 7/8 to 1" long.


SILVER BELL
No. 3 Adit
No. 2 Adit
No. 1 Dump
No. 2 Dump
Glory Hole
Adit
Mack
Mack
Filled
Filled
To Hot Veinx cut
16 Tons Red Ore
42 x 163 70 Tons Gray Ore
20'x20'x4' 50 Tons Ore
Solar Meridian
Variation 15°
Scale 1 inch = 30 ft.


No 2 Adit Lv.
Fl. ±3196
Fl. ±3236
Fl ±3138
#1760
#1752
#1768
Brill hole
Surface
Filled
Sub Lv.
Movie
Hot Vein?
Grey ore?
Dead FeO
all crm Rhy-wFk stain
crm colrd Rhy, Org-brown FeO on frac.
Glory hole
Shaft
3240
Back
Fl ±3138
Fl. ±3196
Fl. ±3236


Road to Camp
Sub Lv. 3195
Approx. outline
Sub Lv. 3220
Slope up 55-60°
2nd Lv. 3240
Sub Lv. 3280?
Glory Hole
Bench
Open Cut
Dump Area
To Adit No 3 (Dozer trail)
Hill
No 3 Adit Level - 3130 ft.
3rd Lv.
To Surface Collar plugged
600
200
2000
200



Shear Blocky
Blky solid
Grn Rhy
Blky, Hard gry-tan Rhy
Gray Rhy-Br
Brwn FeO
Som Brw FeO, Inc
Br Rhy (tan wh)
to Xcut
Face = SiO2
yel brwn FeO
Gry Br Rhy
1745
Hy. Br. Rdgouge
gry altd Rhy.
steeper
Joints
N. Mineralized
Grn-gry Rhy.
1774
1773
1772
1775
Hy FeO
Hy FeOx Brw
Spec Hem
Blky wh Rhy
Hy FeO - Hor
wh Rhy
Med FeO Brwn
light tan
wh. Altd Rhy
Br. Sp. Min.
Sp tan FeOx
tan gry spkd Rhy
Sp FeO
Blch'd
Gry Rhy-tan
FeOx
Blch'd
Gray Rhy
Filled
Med Brwn
altd Rhy
Blch'd Rhy
sp. FeOx
Contorted flow lines
H.W. 300 Lv. strated
Rhy-Sugy
wh. Gray
Hy min BK
FeOx
Filled
up to
45 in BK
Bug FeOx
Altd Rhy
calc. Vugs
sample this
Gy SpKld
Rhy
Blch'd Rhy
Blocky, slighty altd
Rhy
Br.
Hy FeOx Brw Rd
Pinchout Contact
Dike
Br. 2
Blk Brwn
FeOx then
light tan, gy Rhy
Rz. followed
H.W. below
Hy Rd brw FeO
wh Rhy
Hard frac
Grn Rhy-sp,
FeO
Br Rd Brwn
wh Altd Rhy
wh tan
35 altd Rhy.
sp Br.
Hy brwn FeOx
Wh altd Rhy
Frac.
1744

Silver Bell

Columbia

N.40W -70°

E.6

E.5

E.10,000

N.8

N.6

N.4

3200
3100
3000
2900
2800
2700
2600
3300
3400
3500
3600

U.S.M.M.2

U.S.M.M.4

Top

Dike

No 2

Blk Sio2

Tan HW

grn ch dike

1784

1785

Basalt Dike

Camp

Hycmb Qtz phry

Basalt Mill

Bx

Brecciated Qtz

Martinez

Fly Dike

COLEMAN EXPLORATION & MINING CO

COLUMBIA — SILVER BELL MI

PROPERTY: Columbia-Silver Bell TRAVERSE LOCATION: Underground - 3rd Level DATE CALCULATED: 1-28-80 CALC. BY: RM

TRAVERSE CALCULATION SHEET

SHEET NO. 1

B.S. Sta. F.S.	BEARING	SLOPE DIST.	VERT. ∠	Cos. Vert. ∠	HOR. DIST.	Cos. Bear.	Sin. Bear.	LATITUDE	DEPARTURE	Sin. Vert. ∠	VERT. DIST.	H.I. H.P.	ELEVATION
S-2	S 39-50 E							7598 56	E 8120 82				
	203-05							- 401 44	+ 120 82				
(Back) S-1 32	N 16°-45 W	419 23			419 23	95757	28820	N 8000 00	E 8000 00				
91	98-21							- 8 76	- 59 34			- 2 15	- 6 19
(Tie) 32 3-3	S 81-36 W	60 12	- 3°-51	99774	59 98	14608	98927	7991 24	7940 66	06714	- 4 04	0 00	
	176-55				(5332)							- 4 04	
32 (Back) 33 4-1	S 78-31 W	96 81	- 42-05	74217	71 85	19908	97998	- 14 30	- 70 41			+ 5 23	- 39 17
								7976 94	7870 25	67021	- 48 15	+ 3 75	
												- 48 15	

R.E. MIERITZ

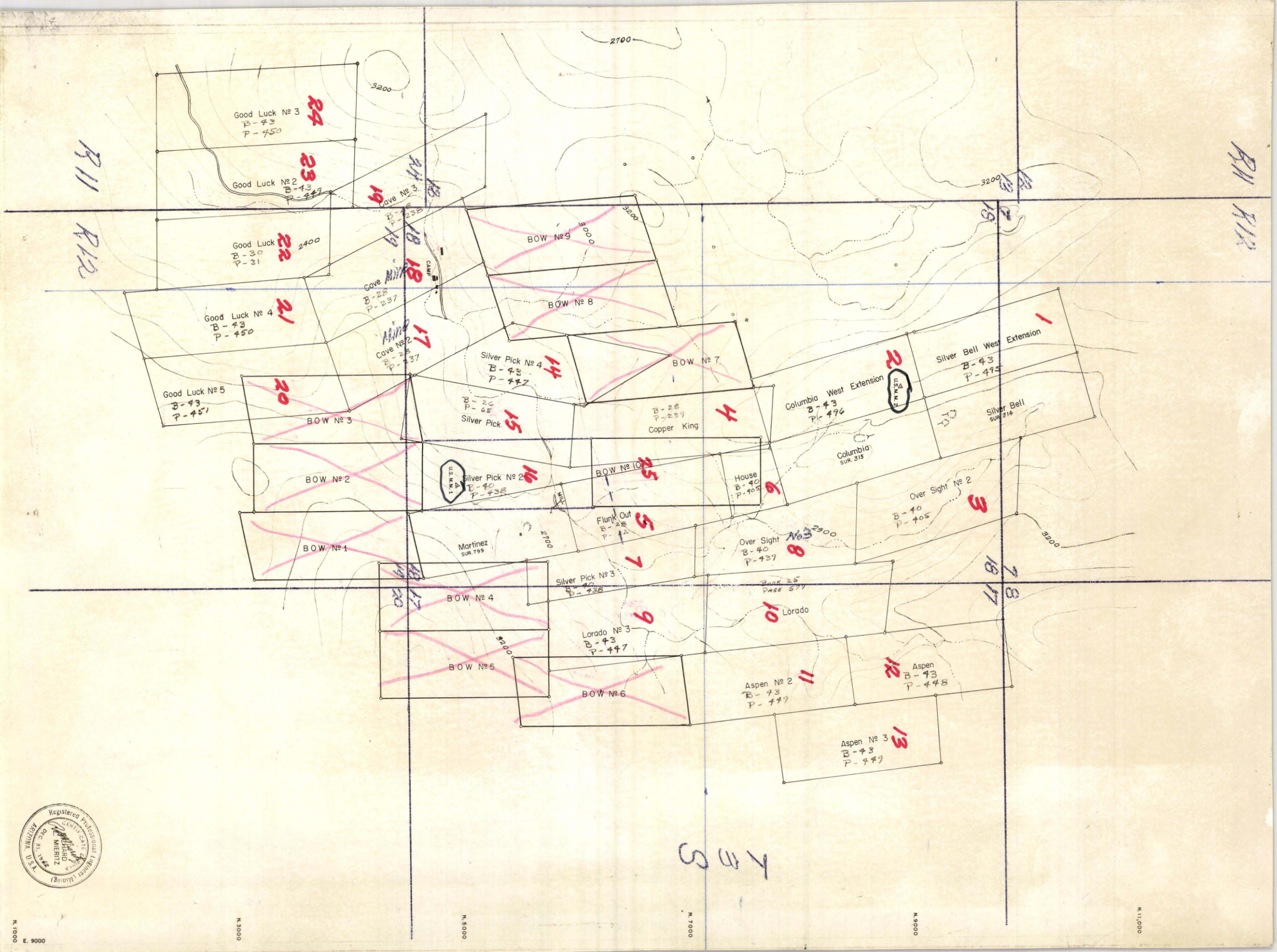
TRAVERSE CALCULATION SHEET

PROPERTY: Columbia TRAVERSE LOCATION: Surface - Pit Area DATE CALCULATED: 1-28-80 CALC. BY: [illegible] SHEET NO. ___

B.S. Sta. F.S.	BEARING	SLOPE DIST.	VERT. ∠	Cos.Vert.∠	HOR. DIST.	Cos. Bear.	Sin. Bear.	LATITUDE	DEPARTURE	Sin.Vert.∠	VERT. DIST.	H.I. H.P.	ELEVATION
B-2	N 16-45W							7598 56	8120 82				3135 00
	156-55							− 49 35	+ 41 17	36962			
B-1 S-2	S 39-50E	64 27			64 27	76791	64056	7549 21	8161 99				
B-1	35-09	(365A4)			(334.78)			+ 333 66	− 27 33			+ 4 82	+ 166 34
B-2 S-3	N 4-41W	400 0	+ 23-49	91484	334 78	99666	08165	7882 87	8134 66	40381	+ 161 52	+ 5 00	3301 34
B-2	172-50							+ 127 21	− 26 69			+ 4 62	+ 2 20
S-3 S-4	N. 11-51 W	130 00	− 1-04	99983	129 98	97869	20535	8010 08	8107 97	01862	− 2 42	− 5 00	3303 54
B-3	176-11							+ 235 37	− 66 01			+ 4 42	− 21 96
S-4 S-6	N 15-40 W	245 0	− 3-50	99776	244 45	96285	27004	8245 45	8041 96	06685	− 16 88	− 11 00	3291 58
B-4	159-21							+ 242 42	− 178 18			+ 4 50	− 56 08
S-6 S-7	N 36-19 W	305 0	− 9-27	98643	300 86	80576	59225	8487 87	7863 78	16419	− 50 08	+ 10 50	3235 50
B-2-S3	N 4-41W											+ 5 00	
B-2	188-10							7882 87	8134 66			+ 10 50	3301 34
S-3 S-5	N 3-29 E	(248A7) 250 0	+ 14-39	96749	(234.01) 234 01	99815	06076	+ 233 58	+ 14 22			+ 4 62	+ 65 79
								8116 45	8148 88	25291	+ 61 17	+ 0 00	3367 13

R.E. MIERITZ

3135
+166.34
3301.34
3299.54
3303.54
3291.58
3301.34
3367.13


Good Luck № 3
B-43
P-450
Good Luck № 2
B-43
P-443
Good Luck
B-30
P-31
Good Luck № 4
B-43
P-450
Good Luck № 5
B-43
P-451
Cave № 3
B-25
P-238
Cave
B-25
P-237
Cave № 2
B-25
P-237
BOW № 9
BOW № 8
BOW № 7
BOW № 3
BOW № 2
BOW № 1
BOW № 4
BOW № 5
BOW № 6
Silver Pick № 4
B-43
P-437
Silver Pick
B-25
P-65
Silver Pick № 2
B-40
P-438
Silver Pick № 3
B-40
P-438
Copper King
B-25
P-237
BOW № 10
Flunk Out
B-25
P-12
House
B-40
P-405
Martinez
SUR. 799
Columbia West Extension
B-43
P-496
Columbia
SUR. 315
Silver Bell West Extension
B-43
P-495
Silver Bell
SUR. 314
Over Sight № 2
B-40
P-405
Over Sight № 3
B-40
P-439
Book 25
Page 577
Lorado
Lorado № 3
B-43
P-447
Aspen № 2
B-43
P-449
Aspen
B-43
P-448
Aspen № 3
B-43
P-449
U.S.M.M. 4
U.S.M.M. 2
MILL
CAMP
2700
3200
2900
3000
N. 1000
E. 9000
N. 3000
N. 5000
N. 7000
N. 9000
N. 11,000

ACKNOWLEDGMENT OF DELIVERY

from: S. 7/V 07

(Stamp UPS shipper number above)

2668173

(Invoice or order number)

Receiving Company's Name Heron Kay

Receiver's Signature (X) Mark Nolan Date 4/30/80

INSTRUCTIONS TO DRIVER: Obtain receiver's signature and date above, detach card, and turn in to operating center that day. Signature must also be obtained on the delivery record.

TO:

Richard Mieritz
3940 N. Casa Tomas
Phoenix, Az
85016

IRON KING ASSAY OFFICE

ASSAY CERTIFICATE

BOX 247 — PHONE 632-7410
HUMBOLDT, ARIZONA 86329

REGISTERED ASSAYER
CERTIFICATE NO. 2978
WALTER G. STATLER
Date Signed 4/21/80
ARIZONA, U.S.A.

ASSAY MADE FOR

RICHARD MIERITZ
2940 N. Casa Tomas
Phoenix, Ariz. 85016

April 21, 1980

SAMPLE DESCRIPTION	Ref. no.	Gold oz/ton	Silver oz/ton	Lead %
#1744	04-14-23	Nil	.020	
#1745	-24	"	4.74	0.10
#1746	-25	"	5.06	
#1747	-26	"	3.58	
#1748	-27	Tr	6.84	
#1749	-28	Nil	3.36	
#1750	-29	Nil	5.06	
#1751	-30	Nil	4.88	
#1752	-31	Nil	7.22	
#1753	-32	Tr	7.40	
#1754	-33	Nil	4.00	
#1755	-34	Nil	3.08	
#1756	-35	"	3.04	
#1757	-36	Nil	3.40	
#1758	-37	"	4.68	
#1759	-38	"	2.90	
#1760	-39	"	Nil	
#1761	-40	"	1.92	
#1762	-41	"	.016	
#1763	-42	Tr	11.16	
#1764	-43	Tr	7.52	
#1765	-44	Nil	11.68	
#1766	-45	Tr	3.94	

CHARGES_____

ASSAYER_____

IRON KING ASSAY OFFICE

ASSAY CERTIFICATE

BOX 247 — PHONE 632-7410
HUMBOLDT, ARIZONA 86329

REGISTERED ASSAYER
CERTIFICATE NO.
2978
WALTER G. STATLER
Date Signed 4-21-80
ARIZONA, U.S.A.

ASSAY MADE FOR

RICHARD MIERITZ
2940 N. Casa Tomas
Phoenix, Ariz. 85016

April 21, 1980

SAMPLE DESCRIPTION	Ref no.	Gold oz/ton	Silver oz/ton
#1767	01-14-46	Nil	9.44
#1768	-47	Tr	12.70
#1769	-48	Tr	3.16
#1770	-49	Nil	2.70
#1771	-50	Nil	2.46
#1772	-51	Tr	5.20
#1773	-52	Nil	Nil
#1774	-53	"	"
#1775	-54	"	"
#1776	-55	Tr	8.20
#1777	-56	Tr	5.00
#1778	-57	Nil	0.12
#1779	-58	"	2.24
#1780	-59	"	1.00
#1781	-60	Tr	0.98
#1782	-61	Nil	1.78
#1783	01-14-62	Nil	1.08

CHARGES $293.00

ASSAYER

Columbia - S. B. Sample Results.

No		Au	Ag	Pb.
1744	5th lev. So. Face, 3.7' hor.	Nil	0.02	✓
45	4th lev. So Drift, E Rz face, 3.4' Vert.	"	4.74	0.10
46	No 2 Adit lev. 1st E. Xcut, N. Wall, 4.6' normal to dip.	"	5.06	✓
47	No 2 Adit lev. 1st E. Xcut, face, 4.0' hor.	"	3.58	✓
48	No 2 Adit lev. Dr. E. Wall (at old #27) 5.5' Vert.	Tr	6.84	✓
49	No 2 Adit lev. 2nd W. Xcut, N cor of Junction with Dr 5.5' Vert	Nil	3.36	✓
1750	No 2 Adit lev 2nd W. Xcut, N. Wall, at 10 ft. 5.6' Vert	"	5.06	✓
51	No 2 Adit lev. 2nd W. Xcut, N. Wall, at 15 ft. 4.0' Vert.	"	4.88	✓
52	3195 Sub lev. S. W. W. Xcut, 3' across fault zone.	"	7.22	✓
53	No 2 Adit lev. SW Xcut to Hot Stope NW Wall, 0-5 ft H.	Tr	7.40	✓
54	" " " " " " " " 5-10 ft H.	Nil	4.00	✓
1755	" " " " " " " " 10-15 ft. H.	"	3.08	✓
56	" " " " " " " " 15-18 ft. H.	"	3.04	✓
57	" " " " " " " " 18-23 ft H.	"	3.40	✓
58	No 2 Adit lev, 4th E Xcut, S. Wall at 3rd E. Dr. 0-5' H.	"	4.68	✓
59	No 2 Adit lev., 4th E Xcut, S. Wall at 2nd E. Dr, 5-10' H.	"	2.90	✓
1760	3220 Sub lev. So Dr. N Wall, Wz bottom, 5 ft Vert.	"	Nil	✓
61	3220 Sub lev. So Dr. W. Wall, 8 ft S of Wz 5 ft V.	"	1.92	✓
62	3220 Sub lev. So Dr. E Wall, (old #43) 6 ft V.	"	0.02	✓
63	3220 Sub lev. Dr So of Rz from 3195 Sub. E. Wall, 3 ft V @ old 49	Tr	11.16	✓
64	3220 Sub lev. Dr No of Rz " " " W Wall of face, 3.3 ft V	Tr	7.52	✓
1765	No 2 Adit lev, 3rd E. Dr, W. Wall, 7 ft N of Wz, 5.4 ft Vert.	Nil	11.68	✓
66	Ore Pass muck, Glory Hole to 300 lev. Grab of muck	Tr	3.94	✓
67	300 lev, Hot vein, E. Dr. N. Wall, at old #75, 3.0 ft Vert.	Nil	9.44	✓
68	200 lev. Hot Vein, Between 2nd & 3rd Dr's, 4.0 ft Vert.	Tr	12.70	✓
69	Ore Pass Muck (#1766) but W. Side. Grab of muck	Tr	3.16	✓
1770	200 lev. - as 1769 on N. Side of Ore Pass Muck.	Nil	2.70	✓
71	200 lev. 2nd E Xcut, 2nd E. Dr, Rz to Surf. Grab of Muck	Nil	2.46	✓

			Au	Ag.	
1772	No 3 Adit Lv. Haulage Dr. 3rd W xcut. Grab of Muck		Tr	5.20	✓
73	No 3 Adit Lv, Haulage Dr. (old #36) E. Wall, 5.5ft Vert.		Nil	Nil	✓
74	No 3 Adit Lv. Haulage Dr. (old #60) E. Wall, 5.4ft Vert.		"	Nil	✓
75	No 3 Adit Lv. Haulage Dr, face 1.5ft Her between faults.		"	Nil	✓
76	No 3 Adit Lv. N. Dr. Hat Vein chute, Grab of Muck		Tr	8.29	✓
77	No 3 Adit Lv. N. Dr. 2nd Xcut (Hat Vein Ch) N wall, 3.5ft Vert.		Tr	5.00	✓
78	Surface, S. B vein outcrop, at Lv. No. 3 Adit, 0.5ft chip.		Nil	0.12	✓
79	West end of dump.	0-5	"	2.24	
80		5-10	"	1.00	
81		10-15	Tr	0.98	
82		15-20	Nil	1.78	
83	East end of dump	20-25	"	1.08	

1.42

952-0362

Columbia - Silver Bell Sample Results.

Orig	Ours	Orig Ag	Our Ag	± Ag	Au	Orig Pb	Our Pb	± Pb	
3	1607	12.4	5.40	-7.0	Tr				South Dr. 3rd lv
8	1608	9.4	5.84	-3.56	"				3rd lv. So. Dr.
13	1609	7.8	4.84	-2.96	"				" So. Dr.
19	1610	3.2	6.78	+3.58	"				" So. Dr
27	1611	7.8	6.92	-0.88	"				3rd lv. No. Dr.
30	1612	10.8	1.62	-9.18	"				" No. Dr
35	1613	2.6	.90	-1.70	"				" No. Dr.
40	1614		4.16		"				" No. Dr
1	1615	5.6	6.26	+0.66	"				Wx, 3rd to 4th lv.
6	1616	6.8	2.74	-4.06	"				~~Wx, 3rd to 4th lv.~~
20	1617	~~4.2~~	2.68	-1.52	.002				4th lv. So. Dr.
23	1618	2.8	8.44	+5.64	Tr				4th lv So. Dr.
27	1619	11.4	11.26	-0.14	"				4th lv So. Dr
31	1620	13.6	2.70	-10.90	"				4th lw So. Dr
36	1621	4.0	2.64	-1.36	"				4th lw So. Dr
39	1622	12.0	11.32	-.68	"				4th lv. So. Dr.
	SB 1090	+	.08						

Ours			
6.40			
5.84			
4.84			
6.78			
6.92			
1.62			
.90			
~~4.16~~			
6.26			
2.74			
2.68			
8.44			
11.26			
2.70			
2.64			
11.32			
8.08	5.56	1400	
4.40	1.68	1040	

2.3 30% low.

ARIZONA DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
PHOTOGRAMMETRY AND MAPPING SERVICES

WORK ORDER - PHOTO LAB

DATE: 3-19-80
SUSPENSE DATE: 3-20-80
DOCUMENT NO.:

ADMINISTRATIVE	BLC. NO.	FUNCTION	OBJECT	AMOUNT

PROJECT NO.	P/N	BLC. NO.	FUNCTION	OBJECT
XR-250-103	10	R-250	0406	

DIRECT PRINTING
B & W, BLUELINE PRINTS, REDLINE PRINTS, ETC.

NO. OF ORIG.	TYPE OF PRTS.	NO. PRTS. EA.	SQ. FT. EA.	TOTAL SQ. FT.	PRICE/SQ. FT.	TOTAL PRICE	SPECIAL INSTRUCTIONS

PHOTO COPY
CONTACT NEGATIVES, POSITIVES, COMPOSITES

NO. OF ORIG.	NEG. EA.	POS. EA.	TYPE MATERIAL	SIZE OF COPY	TOTAL COPIES	TOTAL PRICE	SPECIAL INSTRUCTIONS

AERIAL PHOTOGRAPHS
DOUBLE-WEIGHT OR SINGLE-WEIGHT

JOB NO.	FLIGHT	EXPOSURE NOS.	PHOTO DATE	PHOTO SCALE	ROLL NO.	S/W	D/W	NO. EA.	TOTAL PRTS.	TOTAL PRICE

DIAPOSITIVES

JOB NO.	FLIGHT	EXPOSURE NOS.	PHOTO DATE	PHOTO SCALE	ROLL NO.	PRIORITY	TOTAL B & L	TOTAL KELSH	TOTAL PRICE

AERIAL PHOTOGRAPH ENLARGEMENTS
PAPER, CRONAFLEX, CRONAPAQUE, MOUNTING

JOB NO.	FLIGHT	EXPOSURE NOS.	PHOTO DATE	PHOTO SCALE	ROLL NO.	NO. EA.	TYPE MAT'L.	ENL. SCALE	TOTAL PRICE
11R5	1	4	7-3-78	1=4000	54CM	1		40X40	$36.00

REMARKS: RESALE $36.00

ORDERED BY: Richard E. Meritz | DIVISION | TEL. NO. 277-6053

55-8401 .11/76
(Formerly 82-2302)

2940 N. Oracle Tomas

Paid 3-19-80 WK

Office of State Mine Inspector
705 West Wing
Capitol Building
Phoenix, Arizona, 85007

Dear Mr. McCutchan:

Please be advised that Coleman Mining - S. B., sole proprietorship of Donald D. Coleman, Phoenix, Arizona, will, on or about April 1, 1980, start work on the Columbia-Silver Bell-Martinez mining property, Pioneer Mining District, Pinal County, Arizona.

This is an exploration Project but would include underground "clean-up", drifting, crosscutting and "long hole" drilling into drift and crosscut walls.

Mr. Kenneth Chambers is the person in residence at the "Camp" and in charge of the field work.

Mr. Richard E. Mieritz, Arizona Registered Mining Engineer, Phoenix, will be the Consultant on the Project.

Would you please send two copies of the Mining Code Regulations to me at the address shown.

Sincerely,

_____

Donald D. Coleman
5346 Calle Del Norte
Phoenix, Arizona, 85018

(602) 952-0362

March 24, 1980

Office of State Mine Inspector
105 West Wing
Capitol Building
Phx Az 85007

Dear Mr McCutcheon:

Please be advised that Coleman Mining - S.B., sole proprietorship of Ronald E. Coleman, 6346 College Park, Phoenix, Arizona will on or about April 1990 start work on the Copper Silver Bell - Madonna mining property, Pioneer Mining District, Pinal County, Arizona.

This will be an exploration project and would include underground clean up, drifting, prospecting and long hole drilling into drift walls.

Mr Kenneth Chambers is the person in residence at the "camp" and in charge of the field work.

Mr Ronald E. Coleman, Registered Mining Engineer, Phoenix will be the consultant on the project.

A map is attached and road guide to the property. It is accessible by passenger auto to the camp site. A four wheel drive vehicle would be available for transport to the mine. We would appreciate a few days notice if a visit by one of the Department personnel is planned.

Please call the undersigned at 957-0362 or Mr. Chambers at 277-6534 if there is any questions.

Ours

Would you please send ~~me~~ two copies of the Mining Code Regulations to me at the above address.

M. S. H. A.
Att: Mr. R. E. Riley,
Sub-District Manager
2721 N. Central Ave.
Phoenix, Arizona, 85004

Dear Mr. Riley:

Coleman Mining-S. B., a sole proprietorship of Donald D. Coleman, Phoenix, Arizona, intends to commence work on the Columbia-Silver Bell-Martinez mining property, Pioneer Mining District, Pinal County, Arizona, on or about April 1, 1980

The Columbia-Silver Bell is an old underground mine. The present intended plans of operation are (1) cleanup of several workings for accessibility and (2) accomplish "exploration" by underground methods of drifting, crosscutting, raising and "long hole" drilling into the walls.

Mr. Kenneth Chambers is the person in residence at the "camp" and in charge of the field work.

Mr. Richard E. Mieritz, Arizona Registered Mining Engineer, Phoenix, will be the Consultant on the Project.

Please send two copies of M. S. H. A's. Regulations to me at the address shown.

Sincerely yours,

_____

Donald D. Coleman
5346 Calle Del Norte
Phoenix, Arizona, 85018

(602) 952-0362

March 24, 1980

M. S. H. A.
Att. Mr R. E. Riley, ~~Sub District~~
Sub-District Manager
2721 N. Central Ave.
Phoenix Arizona, 85004

Dear Mr Riley:

Calmat Mining - S.B. a sole proprietorship of Ronald D. Calmat, Phoenix, Arizona intends to commence work on the Columbia - Silver Bell Mining property, Pioneer Mining District, Pinal County, Arizona on or about April 1, 1980.

We request that a representative of your ~~examining~~ office ~~visit~~ inspect and examine at your convenience, the underground mine.

The Columbia - Silver Bell, is an underground mine. The present intended plans of operation are (1) clean up of many workings for accessibility and (2) accomplish "development" by underground methods of drifting, cross-cutting, raising and "long hole" drilling, ~~to open the mine underground~~ ~~about April 1, 1980.~~

~~At the time of the visit we might have~~ ~~if the engineer would bring a "Mine Identity~~ ~~form and assist in completing same, as~~ ~~as required by the Department regulations.~~

~~Attached here with is a map showing the~~ ~~and route to the property. Route to "Ajo~~

~~As practically by agencies rules & [illegible] which shall be available at the "camp" to take the inspection & the sanitary measures [illegible] of the work on the Project from the "camp" to the "camp" is ultimately [illegible] Federal specifications for the State [illegible] the inspector [illegible] the work a few days [illegible] visits [illegible] Federal [illegible]~~

F. E. Hicks
2717 W. 32nd Terrace
Phx, Az 272-6053

Ronald Coleman
5346 - Calle Del Norte
Phx, Az - 952-0362

~~Kenneth~~ Mr. Kenneth Hankins is the person in residence at the "camp" and in charge of the field work. ~~Mr. Hicks~~ Mr. Richard E. Meeks, Esq. ~~Ronald Coleman~~ Mining Eng. Phx will be hereby yours the Mining Consultant on the Project.

Ronald D. Coleman

Please send two copies of M.S.H.A.'s Regulations to me at the address shown.

Office of
~~Arizona~~ State Mine Inspector.
702 West Wing
Capital Building
Phx Az 85007

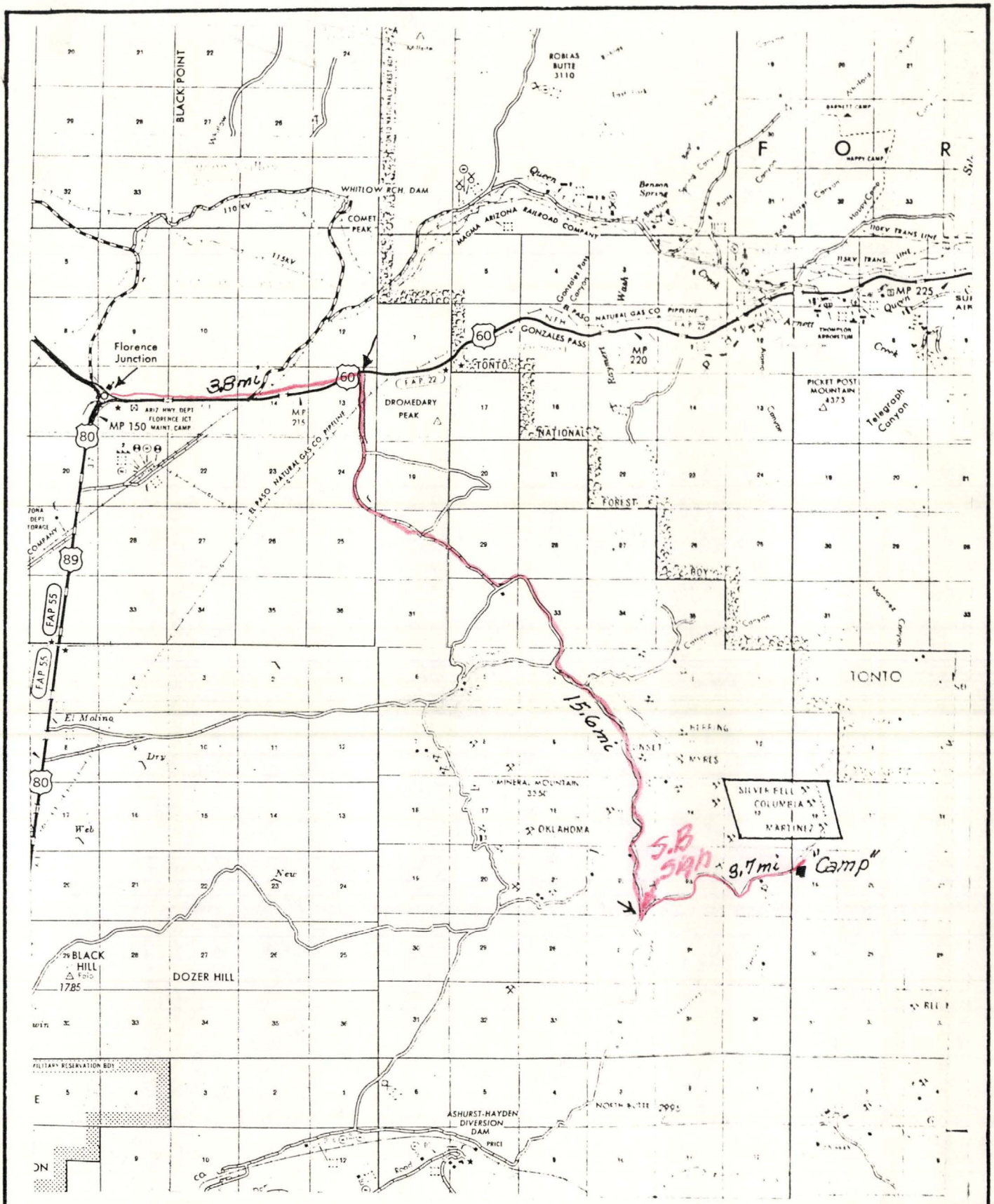
Mine Enforcement & Safety Administration (MSHA) 241-2030
2720 N Central Suite
Phx Az. 85004

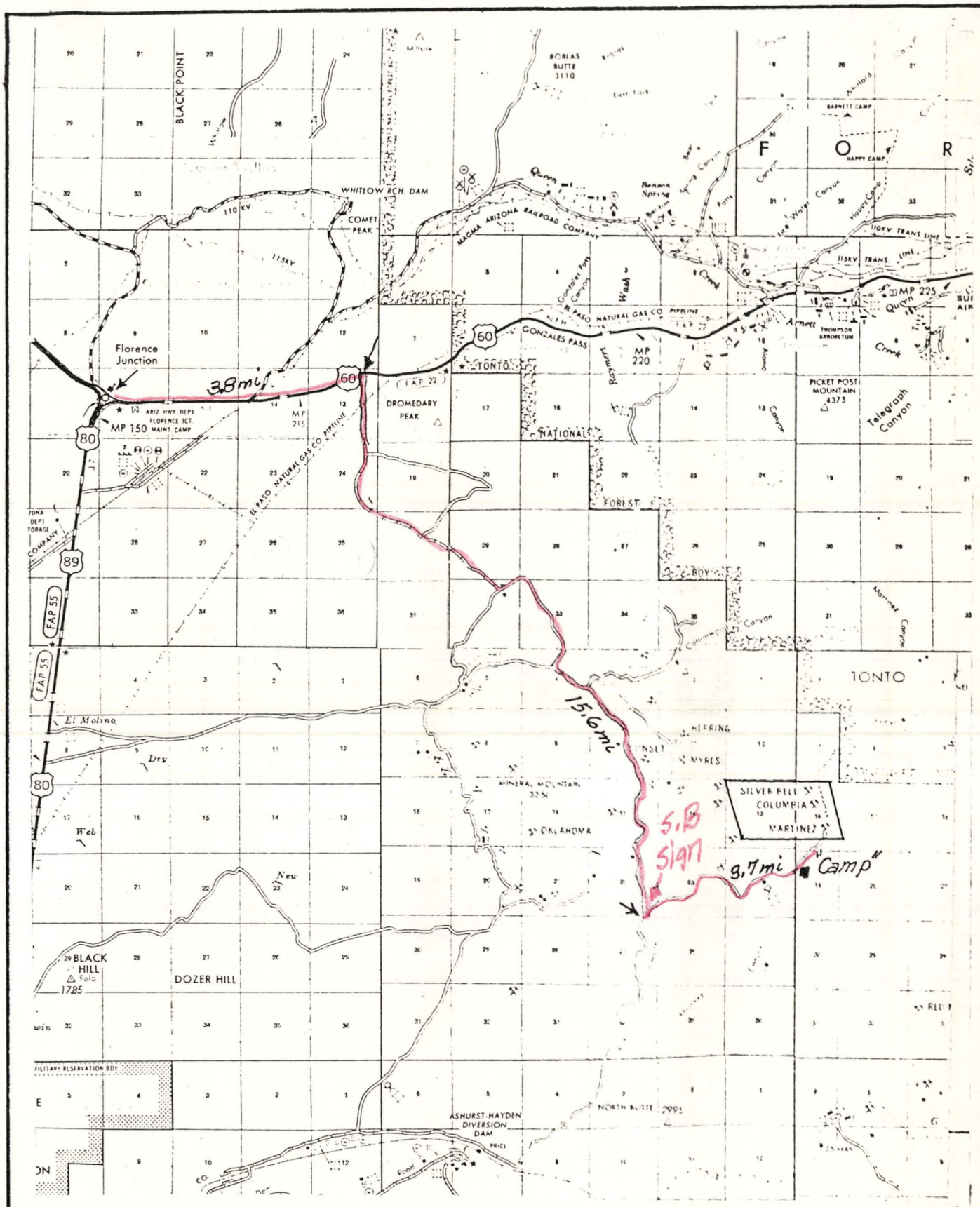
MSHA (Rich.)

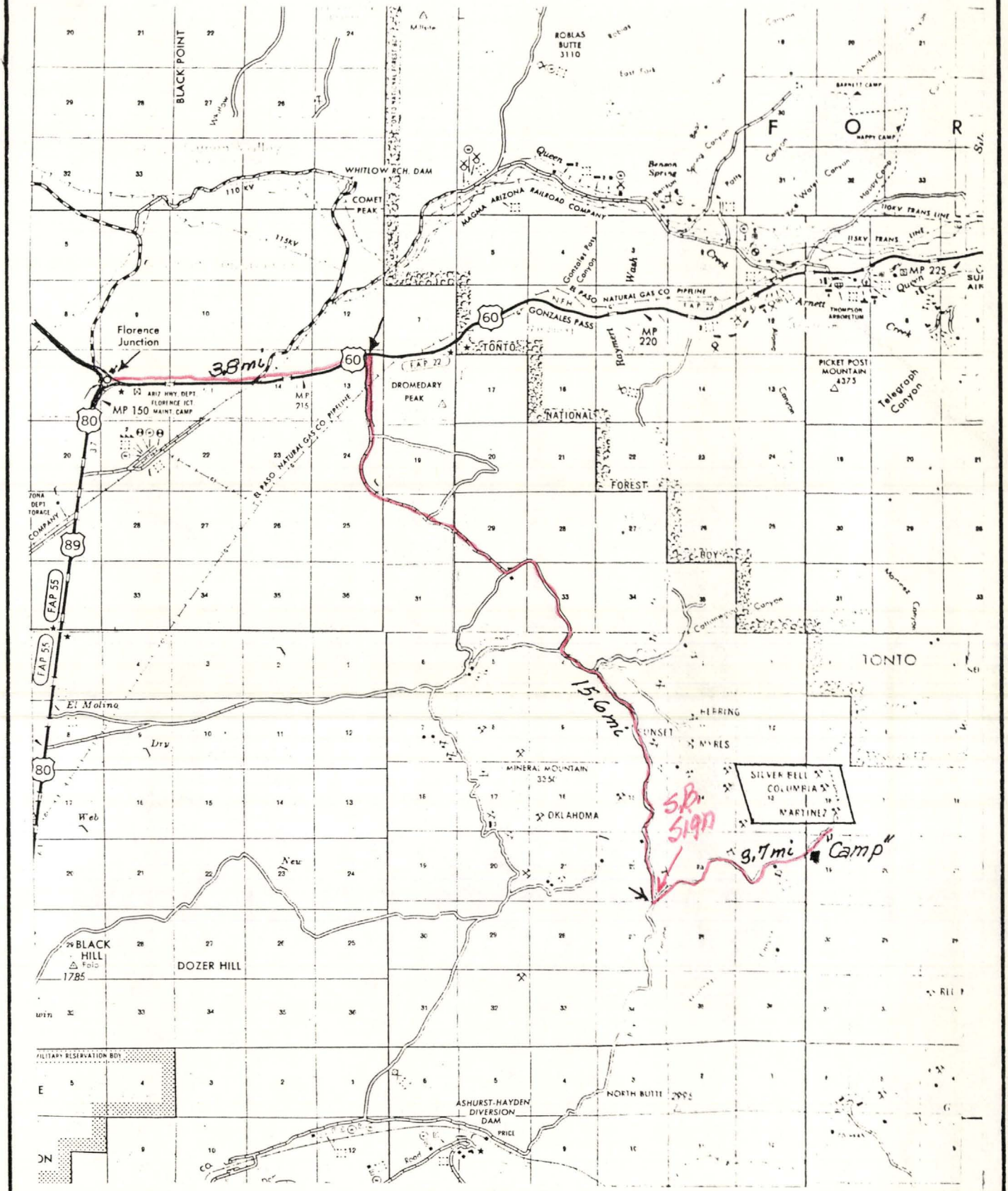
C. A. V. exam intended
FMSHA? Hard-shoe
Safety-glasses
Ask to come back-Air quality → Compliance.
R. E. Riley - Sub District Mgr.

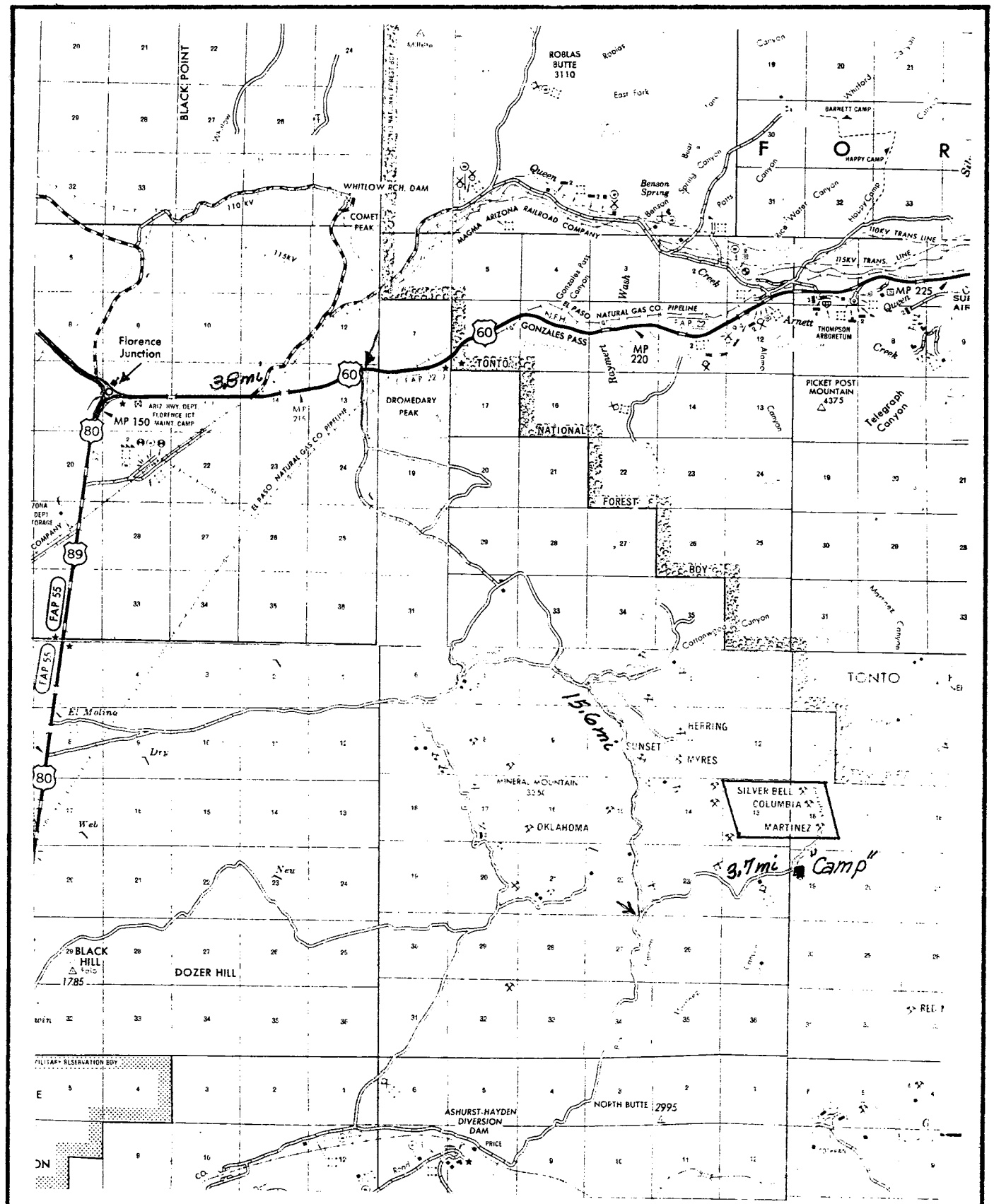
Contents -
Name, address - Coroner/Reporter - Col - L. D. Snyder.
Location
Person in charge in field →
Explanation (underground dept visit and talking.)

Weare not → mining.


BLACK POINT
ROBLAS BUTTE 3110
WHITLOW RCH. DAM
COMET PEAK
MAGMA ARIZONA RAILROAD COMPANY
110 KV
115KV
110KV TRANS LINE
Florence Junction
3.8mi.
60
ARIZ HWY DEPT FLORENCE JCT MP 150 MAINT. CAMP
MP 215
EL PASO NATURAL GAS CO. PIPELINE
GONZALES PASS
MP 220
TONTO
(FAP 22)
DROMEDARY PEAK
NATIONAL FOREST
PICKET POST MOUNTAIN 4373
Telegraph Canyon
MP 225
80
89
FAP 55
El Molino
Dry
Web
New
15.6mi
MINERAL MOUNTAIN 3356
OKLAHOMA
SILVER BELL
COLUMBIA
MARTINEZ
S.B. Sign
9.7mi
"Camp"
BLACK HILL 1785
DOZER HILL
MILITARY RESERVATION BDY
ASHURST-HAYDEN DIVERSION DAM
NORTH BUTTE 2995
PRICE
F O R


Florence Junction
3.8mi.
60
80
89
FAP 55
MP 150
ARIZ. HWY. DEPT. FLORENCE ICT. MAINT. CAMP
EL PASO NATURAL GAS CO. PIPELINE
WHITLOW RCH. DAM
COMET PEAK
BLACK POINT
BOBLAS BUTTE 3110
MAGMA ARIZONA RAILROAD COMPANY
GONZALES PASS
MP 220
TONTO
FAP 22
DROMEDARY PEAK
NATIONAL FOREST
PICKET POST MOUNTAIN 4375
Telegraph Canyon
MP 225
THOMPSON ARBOMETUM
110KV TRANS LINE
115KV TRANS. LINE
El Molino
Dry
Web
New
15.6mi
5.B Sign
9.7mi
"Camp"
MINERA MOUNTAIN 3358
OKLAHOMA
SILVER BELL
COLUMBIA
MARTINEZ
HERRING
INSET
MYRES
BLACK HILL 1785
DOZER HILL
ASHURST-HAYDEN DIVERSION DAM
NORTH BUTTE 2995
MILITARY RESERVATION BDY
FOR


Florence Junction
3.8mi.
MP 150 MAINT. CAMP
ARIZ HWY. DEPT. FLORENCE ICT
MP 215
DROMEDARY PEAK
TONTO
NATIONAL
FOREST
PICKET POST MOUNTAIN 4375
Telegraph Canyon
GONZALES PASS
MP 220
MP 225
WHITLOW RCH. DAM
COMET PEAK
MAGMA ARIZONA RAILROAD COMPANY
EL PASO NATURAL GAS CO. PIPELINE
ROBLAS BUTTE 3110
BARNETT CAMP
HAPPY CAMP
THOMPSON ARBORETUM
BLACK POINT
El Molino
Dry
Web
New
MINERAL MOUNTAIN 3350
OKLAHOMA
HERRING
SUNSET
MYRES
SILVER BELL
COLUMBIA
MARTINEZ
15.6mi
S.B. SIGN
9.7mi
Camp
BLACK HILL 1785
DOZER HILL
ASHURST-HAYDEN DIVERSION DAM
NORTH BUTTE
PRICE
FAP 55
FAP 22
80
89
60


BLACK POINT
ROBLAS BUTTE 3110
Roblas
East Fork
Canyon
Whitlow
BARNETT CAMP
HAPPY CAMP
F O R
WHITLOW RCH. DAM
110 KV
COMET PEAK
115KV
Queen
Benson Spring
Benson
Spring Canyon
Bear
Potts
Canyon
Hauptt Canyon
MAGMA ARIZONA RAILROAD COMPANY
110KV TRANS LINE
115KV TRANS. LINE
Gonzales Pass Canyon
Wash
Creek
MP 225
Queen
EL PASO NATURAL GAS CO. PIPELINE
N.F.H.
FAP 72
60
GONZALES PASS
MP 220
Arnett
THOMPSON ARBORETUM
Florence Junction
3.8mi.
TONTO
Fossil
Alamo
Creek
PICKET POST MOUNTAIN 4375
Telegraph Canyon
ARIZ HWY. DEPT. FLORENCE ICT MAINT. CAMP
MP 150
DROMEDARY PEAK
MP 215
NATIONAL
FOREST
80
89
FAP 55
EL PASO NATURAL GAS CO PIPELINE
COMPANY
BOY
Canyon
Cottonwood
Mormon Canyon
TONTO
El Molino
Dry
15.6mi
HERRING
SUNSET
MYRES
MINERAL MOUNTAIN 3250
SILVER BELL
COLUMBIA
MARTINEZ
OKLAHOMA
Web
New
3.1mi
"Camp"
BLACK HILL
1785
DOZER HILL
MILITARY RESERVATION BDY
NORTH BUTTE 2995
ASHURST-HAYDEN DIVERSION DAM
PRICE
Road

IRON KING ASSAY OFFICE

ASSAY CERTIFICATE

BOX 247 — PHONE 632-7410
HUMBOLDT, ARIZONA 86329

REGISTERED ASSAYER CERTIFICATE NO. 2978 WALTER G. STATLER Date Signed ARIZONA, U.S.A.

ASSAY MADE FOR
RICHARD E. MIERITZ
2940 N. Casa Tomas
Phoenix, Ariz. 85016

Feb. 4, 1980

SAMPLE DESCRIPTION	Ref no.	Gold oz/ton	Silver oz/ton	Lead %	Zinc %	Copper %
#1607	01-15-17	Tr	5.40			
#1608	-18	Tr	5.84			
#1609	-19	Tr	4.84	1.84		
#1610	-20	Tr	6.78			
#1611	-21	Nil	6.92	0.90		
#1612	-22	Tr	1.62			
#1613	-23	Nil	0.90			
#1614	-24	Tr	4.16	0.05		
#1615	-25	Nil	6.26			
#1616	-26	Tr	2.74			
#1617	-27	.002	2.68			
#1618	-28	Tr	8.44			
#1619	-29	Nil	11126	4.18		
#1620	-30	Nil	2.70	2.66		0.65
#1621	-31	Tr	2.64			
#1622	-32	Tr	11.32	Nil		
5%-10% ~~#1623~~	-33	Nil ~~XXXX~~	0.08	0.30		0.06

CHARGES $150.25

ASSAYER

IRON KING ASSAY OFFICE

ASSAY CERTIFICATE

BOX 247 — PHONE 632-7410
HUMBOLDT, ARIZONA 86329

REGISTERED ASSAYER
CERTIFICATE NO. 2978
WALTER C. STATLER
Date Signed 1-28-80
ARIZONA, U.S.A.

ASSAY MADE FOR

RICHARD MIERITZ
2940 N. Casa Tomas
Phoenix, Ari,. 85016

Jan. 28, 1980

SAMPLE DESCRIPTION	Ref no.	Gold oz/ton	Silver oz/ton			
#1601	01-20-11	.004	0.34			
#1602	-12	Tr	0.10			
#1603	-13	.006	0.80			
#1604	-14	.022	57.80			
#1605	-15	.012	2.27			
#1606	-16	Tr	2.90			
#~~1607~~ #1623	-17	Tr	2.30			
#1624	-18	Tr	2.30			
#1625	-19	,014	0.29			
#1626	-20	Tr	2.40			
#1627	-21	Tr	2.04			
#1628	-22	Tr	0.18			
#1629	-23	Tr	3.54			
#1630	-24	Tr	5.50			
#1631	-25	Tr	8.08			
#1632	-26	.004	2.92			
#1633	-27	Tr	0.02			
#1634	-28	.010	0.44			
#1635	-29	Tr	5.70			
#1636	-30	Tr	0.10			
#1637	-31	Tr	0.80			
#1638	-32	Tr	0.30			
#1639	-33	Tr	0.20			

CHARGES_____

ASSAYER_____

IRON KING ASSAY OFFICE

ASSAY CERTIFICATE

BOX 14 — PHONE 632-7410
HUMBOLDT, ARIZONA 86329

REGISTERED ASSAYER
CERTIFICATE NO. 2978
WALTER G. STATLER
Date Signed 1-28-80
ARIZONA, U.S.A.

ASSAY MADE FOR

RICHARD MIERITZ
2940 Casa Tomas
Phoenix, Ariz. 85016

Jan. 29, 1980

REF. NO.	DESCRIPTION	oz/ton Au	oz/ton Ag		% Fe	% Pb	% Zn	% Cu
01-20-34	#1640	.008	1.24					
-35	#1641	Tr	Nil					

CHARGES _____

ASSAYER _____

IRON KING ASSAY OFFICE

ASSAY CERTIFICATE

BOX 247 — PHONE 632-7410
HUMBOLDT, ARIZONA 86329

REGISTERED ASSAYER CERTIFICATE NO. 2978 WALTER G. STATLER Date Signed..... ARIZONA, U.S.A.

ASSAY MADE FOR

Richard Kieritz
2040 Casa Tosas
Phoenix, Ariz. 85016

Feb. 11, 1980

SAMPLE DESCRIPTION	Ref no.	Gold oz/ton	Silver oz/ton			Copper %
No. 1642	01-29-1	.029	1.02			
1643	-2	.026	19.67			
1644	-3	Tr	4.50			
1645	-4	.032	13.64			
1646	-5	Tr	3.76			
1647	-6	.014	12.87			
1648	-7	.010	8.19			
1649	-8	.116	Tr			
1650	-9	.184	0.50			
1651	-10	Tr	Nil			
1652	-11	Nil	Nil			
1653	-12	.274	Tr			
1654	-13	.028	Tr			0.08
1655	-14	.016	1.19			
1656	-15	.028	3.95			
1657	-16	.004	4.92			
1658	-17	Tr	2.40			
1659	-18	.028	0.32			
1660	-19	Tr	2.94			
1661	-20	.008	4.80			
1662	-21	.020	2.86			
1663	-22	.022	2.90			
1664	-23	.010	0.69			

CHARGES_____

ASSAYER_____

IRON KING ASSAY OFFICE

ASSAY CERTIFICATE

BOX 247 — PHONE 632-7410
HUMBOLDT, ARIZONA 86329

REGISTERED ASSAYER
CERTIFICATE NO.
2978
WALTER G. STATLER
Date Signed:
ARIZONA, U.S.A.

ASSAY MADE FOR

Richard Meritz
2940 Casa Tomas
Phoenix, Ariz. 85016

Feb 11, 1980

SAMPLE DESCRIPTION	Ref no.	Gold oz/ton	Silver oz/ton		Lead %	Copper %
No 1665	01-29-24	.018	Tr			
1666	-25	.020	18.74			
1667	-26	Tr	4.70			
1668	-27	Tr	13.78			
1669	-28	.016	4.11			
1670	-29	.024	Tr			
1671	-30	.022	13.18			3.95
1672	-31	.014	7.79		19.60	

CHARGES $233.75

ASSAYER

February 11, 1980

LETTER OF CERTIFICATION

I, Richard E. Mieritz of 2940 N. Casa Tomas, Phoenix, Arizona, Maricopa County, do hereby certify that:

(1) I am a mining engineer, graduated from the University of Wisconsin with the degree of Bachelor of Science in 1939.

(2) I have practised my profession continuously since then, receiving my Arizona State Registration as a Mining Engineer in 1956 and my Arizona State Registration as a Geologist in 1970, being a member in good standing.

(3) The Report prepared for Mr. Donald D. Coleman on the Columbia-Silver Bell Mine has been prepared on the basis of personal observations on and of the property, on the writer's knowledge of the area and the review and study of available factual data.

(4) I have no direct nor indirect interest in the property.

(5) I have no direct nor indirect interest, nor do I expect to receive any interest, direct or indirect, in the properties or securities of Mr. Donald D. Coleman, Phoenix, Arizona, his Associates or affiliates.

Respectfully submitted,

R. E. Mieritz,
Mining Consultant
Phoenix, Arizona

February 11, 1980

Donald D. Coleman
5346 Calle Del Norte
Phoenix, Arizona, 85018

Dear Mr. Coleman:

Herewith the letter of Certification you requested as well as a copy of my Professional Resume.

As soon as I receive the billing from the Iron King Assay Office for the assaying completed on the samples we sent to Mr. Statler, I will account for the out-of-pocket expenses for the work on the Columbia-Silver Bell project.

Earlier this day you indicated you might have some additional work that you wanted me to complete, be it on the Columbia or elsewhere, is not known, however, no arrangements were made for a chargeable rate (Fee).

At the onset, it was agreed a monthly rate of $4500.- would apply. On a 26 day permonth basis, this is $180.- per day. I have carried that rate through--for the December and early January work on the claim situation as well into the report period through January. There were seven days in February, through February 11, 1980--completion of the Report--which will carry the same above mentioned rate-$180.- per day.

My normal Fees are $300.-per day each day for the first three days and then $250.- thereafter. For a 26 day month this would total $6650.-. For intermittent work my rate will be $250.- per day. For engagement of more than ten working days a month, the rate beyond or days excessive of the ten days, can be negotiated downward.

We can discuss this matter at a convenient time upon your return.

Sincerely yours,

R. E. Mieritz

Old	Ours
12.4	5.40
9.4	5.84
7.8	4.84
2.2	6.78
7.8	6.92
10.8	1.62
2.6	0.90
5.6	6.26
6.8	2.74
4.2	2.68
2.8	8.44
11.4	11.26
13.6	2.70
4.0	2.64
12.0	11.32
15 114.40	80.34
7.63	5.36

2.3

30% low.

3 low above 5.0 dif.
2 low left 3-4 dif.
6 low left 0:1-2 dif.

1 high above 5.0 dif.
1 high left 3-4 dif.
1 high about 1/2 dif.

9520362

Columbia-Silver Bell Sample Results.

Orig	Ours	Orig Ag	Our Ag.	± Ag	Au	Orig Pb	Our Pb	± Pb	
3	1607	12.4	5.40	-7.0	Tr				South Dr. 3rd lv
8	1608	9.4	5.84	-3.56	"				3rd lv. So. Dr.
13	1609	7.8	4.84	-2.96	"		1.84		" So. Dr.
19	1610	3.2	4.78	+3.58	"				" So. Dr
27	1611	7.8	6.92	-0.88	"		0.90		3rd lv. No. Dr.
30	1612	10.8	4.62	-3.18	"				" No. Dr
35	1613	2.6	.90	-1.70	"				" No. Dr.
40	1614		4.16		"		0.05		" No. Dr
1	1615	5.6	6.26	+0.66	"				Wx, 3rd to 4th lv.
6	1616	6.8	2.74	-4.06	"				~~Wx, 3rd to 4th~~ ~~lv. So. Dr.~~ lv.
20	1617	4.2 ~~4.0~~	2.68	-1.52	.002				4th lv. So. Dr.
23	1618	2.8	8.44	+5.64	Tr				4th lv So. Dr.
27	1619	11.4	11.26	-0.14	"		4.18		4th lv So. Dr
31	1620	13.6	2.70	-10.90	"		2.66		4th lv So. Dr
36	1621	4.0	2.64	-1.36	"				4th lv So. Dr
39	1622	12.0	11.32	-.68	"				4th lv. So. Dr.
	9B 1090	-	.08		Tr				
	1623		2.30		"				
	24		2.30		~~Tr~~				
	25		0.29		.014				
	26		2.40		Tr				
	27		2.04		"				
	28		0.18		"				
	29		3.54		"				
	30		5.50		"				
	31		8.08		~~Tr~~				
	32		2.92		0.004				
	33		0.02		Tr				

632-7410

632-7410

			Ag	Au				
	1634		0.44	.010				
	35		5.70	Tr.				
42	36		0.10	"				
44	37		0.80	"				
	38		0.30	"				
	39		0.20	"				
50	40		1.24	0.008				No 3 Adit
	41		Nil	Tr.				Latour fault @ #50 ✓
	42		1.02	.028				W. of 4th hw. to 5th W ✓
	43		19.67	.026				" ✓
	44		4.50	Tr				✓
	45		13.63	.032				✓
	46		3.76	Tr				✓
	47		12.87	.014				" " " ✓
	48		8.19	.81				So. of #5 hw ✓
	49		Tr	.116				" ✓
	50		.50	.184				" ✓
	51		Nil	Tr				W. at end of 4th hw ✓
	52		Nil	Nil				" " ✓
	53		Tr	.274				" " ✓
	54		Tr	.028				" " ✓
	55		1.19	.016				" ✓
	56		3.95	.028				at shaft Stat ✓
	57		4.92	.004				✓
	58		2.4	Tr				✓
	59		.32	.028				✓
6	60	6.8	2.94	Tr				No 3 So of #6 ✓
10	61	8.0	4.8	.008				" at #10 ✓

			Ag	Au	Pb	Cu	
15	62	1.2	2.86	.02			No 3 So Dr at #15
	63		2.9	.022			X cut # 3 hr
	64		.69	.01			" "
51	65	7.6	Tr	.018			Sub at 51
55	66	4.0	18.74	.02			" " 655
	67		4.7	Tr			" " Small stope
	68	~~Tr~~	13.78	Tr			" " " "
	69		4.11	.016			Tr to Sub hr.
	70		Tr.	.024			Gray ore
	71		13.18	022		3.95	Gray ore Hand picked
	72		7.79	.014	19.6		" " contains lead.

IRON KING ASSAY OFFICE

ASSAY CERTIFICATE

BOX 247 — PHONE 632-7410
HUMBOLDT, ARIZONA 86329

REGISTERED ASSAYER CERTIFICATE NO. 2978 WALTER G. STATLER Duly Signed ARIZONA, U.S.A.

ASSAY MADE FOR

RICHARD E. MERRITZ
2940 N. Casa Tomas
Phoenix, Ariz. 85016

Feb. 4, 1980

SAMPLE DESCRIPTION	Ref no.	Gold oz./ton	Silver oz./ton	Lead %	Zinc %	Copper %
#1607	01-15-17	Tr	5.40			
#1608	-18	Tr	5.84			
#1609	-19	Tr	4.84	1.84		
#1610	-20	Tr	6.78			
#1611	-21	Nil	6.92	0.90		
#1612	-22	Tr	1.62			
#1613	-23	Nil	0.90			
#1614	-24	Tr	4.16	0.05		
#1615	-25	Nil	6.26			
#1616	-26	Tr	2.74			
#1617	-27	.002	2.68			
#1618	-28	Tr	8.44			
#1619	-29	Nil	11.26	4.18		
#1620	-30	Nil	2.70	2.66		0.65
#1621	-31	Tr	2.64			
#1622	-32	Tr	11.32	Nil		
#1623	-33	Nil 0.03R	0.08	0.30		0.06

CHARGES $150.25

ASSAYER

SAMPLE NUMBERS OF ORE BLOCKED OUT

COLUMBIA-SILVER BELL

	Assays.	Sample #.	Width ft.	Ag. Oz.		Pb.%		
BLOCK A.	290	8	25	7.4		0.8		
	286	4	25	12.8		2.7		
	287	5	12	22.6		2.2		
	288	6	10	16.4		5.3		
	289	7	4	10.6		3.3	Equated	Values
							Ag.	Pb.%
	296	fill		10.8		3.3	13.9	2.7
BLOCK B.	291	12	12	7.6		0.9		
	292	10	10	6.8		1.1		
	293	11	15	2.4		0.0	Equated	Value
							Ag.	Pb.%
	296	fill		10.8		3.3	8.5	2.2
BLOCK C.	280	1	11	6.4	70.4	4.9		
	284	2	10	16.2	162.0	4.1		
	285	3	14	17.8	249.2	3.7		
	283	1	10	11.0	110.0	2.0		
	286	4	13	12.8	166.4	2.7		
	286	4	25	12.8	320.0	2.7		
	287	5	12	22.6	271.2	2.2	Equated	Value
	288	6	10	16.4	164.0	5.3	Ag.	Pb.%
	289	7	4	10.6	42.4	5.3	13.1	2.6
			109		1555.4	14.27		
BLOCK D.	291	9	12	7.6		0.9		
	292	10	10	6.8		1.6		
	295	11	15	2.4		0.0		
	276	20	20	10.2		0.0	Equated	Value
	278	21	5	11.0		2.2	Ag.	Pb.%
	279	22	14	7.4		0.8	7.2	0.5
BLOCK E.	273	17	14	13.6	190.4	5.0		
	274	18	12	10.0	120.0	1.4		
	340	19	14	11.8	165.2	2.3		
	280	1	11	6.4	70.4	4.9	Equated	Value
	284	2	10	16.2	162.0	1.1	Ag.	Pb.%
	285	3	14	17.8	249.2	3.7	12.5	3.0
			77		957.2		12.43	
BLOCK F.	250	68	7	11.0		8.7		
	251	69	8	5.4		0.0		
	252	70	8	5.8		0.0		
	253	71	8	10.8		0.5		
	254	72	8	10.2		0.0		
	255	73	7	8.6		0.0		
	256	74	7	8.4		0.0		
	257	75	7	11.2		0.0		
	276	20	20	10.2		0.0	Equated	Value
	278	21	5	11.0		2.2	Ag.	Pb.%
	279	22	14	7.4		0.8	9.2	0.4
BLOCK G.	202	36	5	5.6		1.0		

	Assay#	Sample#	Width ft.	Ag. Oz.	Pb.%		
BLOCK G.	203	26	5	5.6	1.0		
	204	28	5	9.2	0.0		
	205	29	5	10.2	0.0		
	206	30	6	10.0	0.0		
	208	32	5	12.6	0.7		
	273	17	14	13.6	5.0	Equated	Value
	274	18	17	10.5	1.4	Ag.	Pb.%
	340	19	14	11.3	2.3	10.8	2.2
BLOCK H.	273	17	14	13.6	190.4 5.0		
	340	19	14	11.8	165.2 2.3		
		11	4	31.4	125.6 1.7		
		12	4	24.8	99.2 4.1		
		13	4	15.8	63.2 2.9		
		14	5	11.4	57.0 3.7	Equated	Value
		15	7	15.4	109.2 0.9	Ag.	Pb.%
		16	5	2.8	14.0 0.5	13.0	2.5
			57		823.8	14.45	
BLOCK H. Probable		1	11	10.2	3.1		
		2	7	9.8	4.8		
		3	6	14.2	5.7		
		4	12	6.6	2.2		
		5	5	13.6	4.6		
		7	6	5.2	0.8		
		9	7	3.2	1.1		
		10	5	13.2	1.5		
BLOCK I. (Hot?)	202	26	5	5.6	1.0		
	203	27	5	8.6	1.5		
	204	28	5	9.2	0.0		
	205	28 29	5	10.2	0.0		
	206	30	6	10.8	0.7		
	206	32	5	12.6	0.7		
		35	6	11.0	0.7		
		34	7	9.0	0.8		
	250	66	7	11.0	2.7		
	251	69	8	5.4	0.0		
	252	70	8	5.8	0.0		
	253	71	8	10.8	0.5		
	254	72	8	10.2	0.0		
	255	73	7	8.6	0.0		
	256	74	7	8.4	0.0		
	257	75	7	11.2	0.0		
		30	7	6.0	0.4		
		32	5	11.0	0.6		
		33	6	7.2	1.1		
		34	5	4.6	0.0		
		35	5	2.6	0.6		
		36	5	2.4	0.5		
		37	6	1.8	0.7		
		77	7	7.8	0.7		
		78	7	7.6	8.1		
		79	6	4.8	1.5		
		80	5	omit			
		81	6	8.6	1.8		

	Assay#	Sample#	Width ft.	Ag. Oz.	Pb.	
BLOCK I (Cont'd)		82	5	8.2	0.7	
		83	6	3.8	1.7	
		84	6	13.6	1.5	
		85	5	13.2	2.7	
		86	6	14.8	0.9	Equated Value
		87	5	11.2	0.8	Ag. Pb.
		88	6	10.6	1.0	8.2 0.7
BLOCK J.		77	7	8.8	0.7	
		78	7	7.6	3.1	7.0
		79	6	4.8	1.5	6|420
		80	3	omit	14.0	
		81	6	8.6	1.8	
		82	5	8.2	1.2?	
		83	6	3.8	1.7	
		84	6	13.6	1.5	17.3
		85	5	13.2	2.7	5|234
		86	6	14.9	0.9	
		87	6	11.2	0.8	
		88	6	10.6	1.0	
	101	1	6	6.8	1.8	
	102	2	6	7.0	1.8	
	103	3	6	12.4	2.0	
	103	4	5	7.6	0.3	
	110	5	5	7.6	1.0	
	112	6	5	8.2	1.0	
	111	7	6	9.2	0.7	
	113	8	5	9.4	0.5	
	114	9	5	6.6	0.0	
	115	10	4	8.0	0.8	
	116	11	6	8.0	0.8	
	117	12	5	7.2	0.7	
	118	13	4	7.8	0.7	
	119	14	5	8.4	0.5	
	120	16	4	1.2	0.5	
	121	16	4	4.2	0.0	
	123	17	4	5.8	0.9	
	124	18	4	5.0	0.0	
	125	19	4	3.2	0.0	
	126	20	5	8.6	0.5	
	127	21	5	7.6	0.8	
	107	22	5	6.0	1.6	
	129	23	8	8.4	2.1	
	130	24	6	9.0	2.7	
	132	25	4	9.0	2.3	
	133	26	4	9.2	0.0	
	134	27	4	7.8	1.3	
	270	28	4	5.0	1.0	Equated Value
	135	29	4	9.6	1.1	Ag. Pb.
	136	30	8	6.0	0.4	7.7 1.0
BLOCK K.						
	101	1	6	6.8	1.8	
	102	2	6	7.0	1.8	
	103	3	8	12.4	2.0	
	108	4	5	7.6	2.3	
	110	5	5	7.6	1.0	

BLOCK K (Cont'd)	Assay#	Sample	Width ft.	Ag. Oz.	Pb.%
	112	6	5	6.8	1.8
	111	7	6	9.2	0.7
	113	8	6	9.4	0.5
	114	9	5	6.6	0.0
	115	10	4	8.0	0.8
	116	11	6	8.0	0.8
	117	12	5	7.2	0.7
	118	13	4	7.8	0.7
	78	1	6	5.6	1.2
	83	2	6	7.0	1.6
	84	3	7	4.8	1.5
	85	4	7	6.0	1.5
	86	5	7	4.6	0.7
	87	6	6	6.8	0.3
	88	7	6	8.2	0.0
	89	8	6	1.6	0.0
	90	9	6	3.2	0.0
	66	41	7	10.4	7.3
	67	42	6	11.8	7.2
	68	43	7	10.6	2.3
	69	44	7	5.6	1.2
	70	45	6	5.8	0.5
	73	49	5	0.4	0.0
	74	50	6	9.8	4.4
	75	51	5	8.0	4.0
	76	52	5	4.4	0.9
	45	20	5	4.2	0.0
	47	21	5	2.4	0.0
	48	22	5	0.4	0.0
	49	22	4-	0.4	0.0
	50	23	4	2.8	0.0
	51	24	4	2.0	0.0
	52	25	4	3.0	0.0
	53	26	4	7.4	0.3
	54	27	5	11.4	2.2
	55	28	4	8.6	3.3
	56	29	4	0.8	1.6
	57	30	4	5.8	3.0
	58	31	4	13.6	10
	59	32	4	9.6	3.2

BLOCK L						Equated Value Ag.	Pb.%
	66	41	7	10.4	7.3	6.1	1.5
	67	42	6	11.8	7.2		
	68	43	7	10.6	2.3		
	69	44	6	5.6	1.2		
	70	45	6	5.8	0.5		
	73	49	5	0.4	0.0		
	74	50	6	9.8	4.4		
	76	51	5	0.0	4.0		
	75	52	5	4.4	0.0		
	60	33	6	6.4	3.2		
	61	34	7	10.0	3.2		
	62	35	5	5.8	0.3		
	63	36	5	4.0	0.4		
	64	37	6	5.4	7.5		
	65	38	6	12.0	4.3		

	Assay#	Sample#	Width ft.	Au. Oz.	Pb.	
BLOCK L (Cont'd)		39	8	12.0	4.5	
		40	8	13.0	4.3	
	119	14	5	6.4	0.5	
	120	15	4	1.2	0.5	
	121	16	4	4.2	0.0	
	123	17	4	5.8	0.0	
	124	18	4	3.2	0.0	
	125	10	4	5.0	0.0	Equated Value
	126	20	5	6.6	0.5	Au. Pb.
	127	21	5	7.6	0.8	7.4 2.6
BLOCK M	228	50	6	10.0	3.7	
	222	44	5	0.6	0.0	
	223	45	5	2.8	0.0	
		46	5	4.2	0.0	
		47	6	16.6	0.5	
		48	6	13.4	1.2	
		49	6	7.8	2.1	
	52	230	7	9.2	1.1	
	229	51	6	7.6	2.3	
	237	58	6	8.0	3.1	
	238	59	7	8.2	2.7	Equated Value
	241	60	6	14.0	1.3	Au. Pb.
	242	61	7	6.6	0.8	9.0 1.4
BLOCK N	227	50	6	0.0	3.1	
	229	51	6	7.6	2.5	
	230	52	7	9.2	1.1	
	231	53	6	6.8	0.5	
	232	54	6	7.0	0.7	
	233	55	6	4.0	3.5	
	235	56	5	4.4	0.5	
	236	57	5	7.2	0.0	
	244	63	5	3.8	1.0	
	246	64	6	6.4	0.0	
	247	65	6	6.8	0.9	Equated Value
	248	66	5	0.6	0.0	Au. Pb.
	249	67	5	14.0	1.3	8.0 1.1

shaft on shoot

Tonnage based on ten cubic feet in place, make one ton.

SAMPLE NUMBERS AND ORE PLACED OUT

MARTINEZ

	Sample#	Width Ft.	Ag. Oz.	Pb.%		
BLOCK A	1	5	0.4	0.5		
	2	4	0.2	3.5		
	3	4	0.2	3.0		
	4	4	0.6	0.0		
	5	5	0.2	0.0		
	6	5	0.2	1.6		
	8	8	0.6	3.8		
	20	7	1.6	6.6	Equated	Values
	21	7	1.6	11.6	Ag.	Pb.%
	10.2	7	0.6	7.3	0.7	5
BLOCK B	9	6	1.0	6.1		
	10	5	3.6	6.6		
	11	7	2.4	10.1		
	12	6	13.2	11.8		
	13	7	5.2	9.0		
	14	6	2.4	12.3		
	15	7	1.0	7.0		
	16	6	1.0	12.9		
	17	5	2.4	0.3		
	18	6	1.0	4.9		
	19	5	0.2	4.0		
	20	7	1.6	6.6	Equated	Values
	21	7	1.6	11.6	Ag.	Pb.%
	10.2	7	0.6	7.3	2.4	6.3
BLOCK C	5	5	0.2	0.0		
	6	6	0.2	1.6		
	8	8	0.6	3.8		
	32	4	0.4	6.8		
	33	4	0.6	2.0		
	23	6	6.0	10.4	Equated	Values
	24	6	1.2	11.8	Ag.	Pb.%
	25	6	0.4	5.0	1.7	9.0
BLOCK D	23	6	6.0	10.4		
	24	6	1.2	11.8		
	25	6	0.4	5.1		
	26	6	1.8	8.4		
	27	5	14	8.2		
	28	5	1.8	8.1		
	29	5	1.8	8.6		
	30	7	4.8	10.2		
	31	7	2.2	15.9		
	9	6	1.0	6.1		
	10	5	3.6	6.6		
	11	7	2.4	10.2	Equated	Values
	12	7	5.2	9.0	Ag.	Pb.%
	14	6	2.4	12.3	3.2	9.8

	Sample#	Width Ft.	Ag Oz.	Pb.%		
BLOCK E	34	10	1.6	4.4		
	35	6	10.6	9.9		
	36	6	0.2	6.9		
	37	4	4.4	13.1		
	38	5	1.2	11.3		
	40	7	0.4	5.8		
	26	6	1.2	8.4		
	27	6	1.4	9.2	Squrted Values	
	28	5	1.8	8.1	Ag.	Pb.%
	29	5	1.8	8.6	3.3	7.5
PROBABLE ORE						
BLOCK C	1	5	0.4	0.5		
	2	4	0.2	3.5		
	3	4	0.2	0.0		
	4	4	0.6	0.0		
BLOCK D	15	7	1.0	7.0		
	16	7	10	12.9		
	17	5	2.4	0.3		
	18	5	1.0	4.9		
	19	5	0.2	4.0		
BLOCK E	30	7	4.8	10.2		
	31	7	2.2	15.9		
	32	4	0.4	6.2		
	33	4	0.6	2.0		

Assays as high at 2000 ozs. silver have been from seams of selected ore in the Silver Bell - GH.

CRUDE ORE SHIPMENTS FROM [illegible]

DATE	WEIGHT#	VALUE$	DATE	WEIGHT	VALUE
2/20/23	69082	948.64	4/18/27	126982	770.15
2/27/23	60214	848.66	2/26/27	126483	709.59
3/6/23	84474	408.43	3/4/27	122603	915.10
3/17/23	75552	337.05	3/10 27	118692	1918.36
3/31/23	86400	422.93	3/17/27	118002	594.14
4/13/23	75272	353.78	3/28/27	99774	675.47
4/13/23	81302	427.24	4/18/27	116535	589.86
4/18/23	87805	456.30	4/25/27	115093	689 59
4/21/23	94803	580.78	4/25/27	102683	540.63
5/5/23	94197	317.88	5/10/27	112402	574.37
5/12/23	83025	244.35	5/10/27	114809	579.35
5/18/23	80369	434.06	5/16/27	114987	670.37
5/22/23	95516	256.88	5/18/27	84768	2216.54
5/22/23	89185	505.79	6/6/27	83918	560.25
5/29/23	73925	227.52	6/6/27	107673	611.64
6/5/23	80259	44.74	6/10/27	104730	568.53
6/12/23	70487	58.60	6/10/27	94973	399.30
5/29/23	91094	328.26	6/10/27	106161	410.31
8/3/26	68508	737.19	6/13/27	104730	577.97
8/9/26	73907	1165.84	6/16/27	94973	419.46
8/23/26	101326	1233.64	6/18/27	106161	439.40
9/7/26	112153	1382.85	6/18/27	94510	621.40
9/10/26	98474	1251.60	6/21/27	69993	1768.77
9/22/26	99253	1100.65	6/23/27	94510	636.52
10/11/26	96135	976.71	6/24/27	109061	706.17
10/11/26	89707	780.27	7/2/27		462.09
10/16/26	83767	17.18	7/8/27	95684	570.78
10/23/26	97047	954/08	7/11/27	98780	1355.26
11/1/26	75680	947.26	7/13/27	95684	583.19
11/3/26	90016	774.18	8/6/27	103121	622.34
11/6/26	85416	1429.01	4/17/28	102134	1561.2
11/5/26	95074	1007.78	5/26/28	62585	98440
11/11/26	83656	806.79	5/28/28	90189	1604.46
11/16/26	85047	827.98	6/23/28	70980	964.56
11/29/26	106518	1122.70	7/5/28	98511	1042.04
12/10/26	77087	717.29	7/24/28	61888	720.07
12/14/26	89562	649.77	8/9/28	74340	827.07
12/27/26	102?5	1540.70	8/13/28	66475	522.02
12/31/26	94784	651.64	8/21/28	83601	750.74
1/4/27	110916	571.32	9/13/28	68322	657.34
1/19/27	125451	749.57	1/19/27	127599	857.47
1/19/27	120447	657.04	1/24/27	127559	860.02
2/3/27	124844	737.45	2/9/27	117048	740.11
TOTAL weight				8,082,525	
		TOTAL value			$63,746.15
TOTAL amount of tons				4041.26	
		Per Ton			$ 15.77

ORE RESERVE CALCULATIONS
COLUMBIA-SILVER BELL

Sheet ___

BLOCK NO. _____
LOCATION. _____
TYPE _____

	Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT		Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT
1					21				
2					22				
3					23				
4					24				
5					25				
6					26				
7					27				
8					28				
9					29				
10					30				
11					31				
12					32				
13					33				
14					34				
15					35				
16					36				
17					37				
18					38				
19					39				
20					40				
Total					Total				
					Sub total Col. 2				
					Total				

Samp. Avg. Width _____
Weighted Avg. Silver _____

Columbia - Silver Bell Mine

SAMPLE GUIDE and ASSAY RESULTS

Coleman Samples						Starbird Samples			
Sample No.	Width	Ounces Gold	Ounces Silver	Percent Lead	Percent Copper	Sample No.	Width	Ounces Silver	Sample Location
1607	7.5ft.	Tr.	5.40			3	8.0ft	12.40	No. 3 Adit, So. Drift.
1608	5.0	Tr.	5.84			8	5.0	9.40	" " " "
1609	4.0	Tr.	4.84	1.84		13	4.0	7.80	" " " "
1610	4.5	Tr.	6.78			19	4.0	3.20	" " " "
1611	6.5	Tr.	6.92	0.90		27	4.0	7.80	" " No. "
1612	6.5	Tr.	1.62			30	6.0	10.80	" " " "
1613	6.0	Tr.	0.90			35	5.0	2.60	" " " "
1614	5.0	Tr.	4.16	0.05		40	8.0		" " " "
1615	4.0	Tr.	6.26			1	6.0	5.60	Winze, No. 3 Adit to 4th Lv.
1616	5.5	Tr.	2.74			6	6.0	6.80	" " " "
1617	5.6	0.002	2.68			20	5.0	4.20	4th Lv., So. Drift.
1618	6.0	Tr.	8.44			23	4.0	2.80	" " "
1619	5.5	Tr.	11.26	4.18		27	5.0	11.40	" " "
1620	5.0	Tr.	2.70	2.66		31	4.0	13.60	" " "
1621	4.5	Tr.	2.64			36	5.0	4.00	" " "
1622	6.0	Tr.	11.32			39	8.0	12.00	" " "
1623	5.0 H	Tr.	2.30						No. 3 Adit, So. Dr., 1st X-cut, 0-5'
1624	5.0 H	Tr.	2.30						" " " " " " 5-10'
1625	5.0 H	0.014	0.29						" " " " " " 10-15'
1626	5.0 H	Tr.	2.40						" " " " " " 15-20'
1627	3.0 H	Tr.	2.04						" " " " " " 20-23'
1628	1.0 H	Tr.	0.18						" " " " " " 23-24'
1629	10.0 H	Tr.	3.54						" " " " , at "Y", N. wall.
1630	5.0 H	Tr.	5.50						" " " " , 2nd X-cut, 0-5'
1631	5.0 H	Tr.	8.08						" " " " " " 5-10'
1632	5.0 H	0.004	2.92						" " " " " " 10-15'
1633	5.0 H	Tr.	0.02						" " " " " " 15-20'
1634	3.0 H	0.010	0,44						" " " " " " 20-23'
1635	5.0 H	Tr.	5.70						" " , No. Dr., 1st X-cut, 0-5'
1636	6.6	Tr.	0.10			42			" " " "
1637	4.5	Tr.	0.80			44			" " " "
1638	5.0 N	Tr.	0.30						" " " " , 5' up Raise.
1639	4.0	Tr.	0.20						" " " " , at Raise face.
1640	3.0	0.008	1.24			50			" " " " , F.W. to H.W.

Columbia - Silver Bell Mine
SAMPLE GUIDE and ASSAY RESULTS

Colonan Samples						Starbird Samples			
Sample No.	Width	Ounces Gold	Ounces Silver	Percent Lead	Percent Copper	Sample No.	Width	Ounces Silver	Sample Location
1641	4.0 ft.	Tr.	Nil			50			No. 3 Adit, No.Dr., between faults in back
1642	6.0	0.028	1.02			10			Winze, 4th Lv. to 5th Lv., No. wall.
1643	6.5	0.026	19.67			11			" " " " " " "
1644	6.5	Tr.	4.50			12			" " " " " " "
1645	4.0	0.032	13.63			13			" " " " " " "
1646	4.0	Tr.	3.76			14			" " " " " " "
1647	4.5	0.014	12.87			15			
1648	5.0	0.010	8.19			17			5th Lv., So. Drift.
1649	6.6	0.116	Tr.			18			" " " "
1650	5.5	0.184	0.50			19			" " " "
1651	4.0	Tr.	Nil						Wz, end of 4th Lv., So. Drift, down 4'.
1652	4.5	Nil	Nil						Wz. bottom, (sub lv.), as above
1653	5.0	0.274	Tr.						Wz. (sub lv.) E. wall, between Wz & Rs.
1654	3.75	0.280	Tr.						Wz., No. face of sub. lv.
1655	1.75	0.016	1.19						Wz., up Rs 8 ft., No. wall.
1656	4.0 H	0.028	3.95						Wz. Station, So. wall, 0 -4'.
1657	5.0 H	0.004	4.92						" " " " " , 4 -9'.
1658	5.0 H	Tr.	2.40						" " " " " , 9-14'. H.W. @ 14'?
1659	5.0 H	0.028	0.32						" " " " " , 14-19'
1660	6.0	Tr.	2.94			6	5.0	6.80	No. 3 Adit, So. Drift.
1661	6.5	0.008	4.80			10	4.0	8.00	" " " " .
1662	6.0	0.020	2.86			15	4.0	1.20	" " " "
1663	4.0 N.	0.022	2.90						Wz. X-cut, No. 3 Adit, F.W. to east..
1664	6.0 N	0.010	0.69						" " " " 4' to 10 '.
1665	2.5	0.018	Tr.			51	6.0	7.60	Sub Lv.(3195) @ Rs-Wz, middle of Lv.
1666	4.5	0.020	18.74			55	6.0	4.00	Sub Lv.(3195), So Drift.
1667	3.0	Tr.	4.70						Sub. Lv., So. Drift, Face small stope.
1668	2.5	Tr.	13.78						" " " " " " "
									with visible Galena "eggs"
1669	5.0	0.016	4.11						Rs. 37' up, between No. 3 Adit & Sub Lv.
1670	2.5	0.024	Tr.						Across "gray ore"?- in Pit on surface.
1671		0.022	13.18		3.95				Hand picked of gray ore in muck-surface.
1672		0.014	7.79	19.60					Hand picked of gray ore with galena.

Samples were assayed by Walt Statler, Iron King Assay Office, Humboldt, Arizona., an Arizona Registered Assayer.

ORE RESERVE CALCULATIONS
COLUMBIA-SILVER BELL

Sheet 1

BLOCK NO. Inf. I
LOCATION. No 2. Adit Lv to Surface (32
TYPE Inferred-Siliceous

	Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT		Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT
1	4	25.0	12.8	320.0	21				
2	5	12.0	22.6	271.2	22				
3	6	10.0	18.4	184.0	23				
4	7	4.0	10.6	42.4	24				
5	8	25.0	7.4	185.0	25				
6	10	10.0	6.8	68.0	26				
7	11	15.0	2.4	36.0	27				
8	12	12.0	7.8	93.6	28				
9	20	20.0	10.2	204.0	29				
10	21	5.0	11.0	55.0	30				
11	22	14.0	7.4	125.8	31				
12					32				
13					33				
14					34				
15					35				
16					36				
17					37				
18					38				
19					39				
20					40				
	Total 152		1585.0			Total			
						Sub total Col. 2	152.0		1585.0
						Total	152.0		1585.0

Registered Professional Engineer (Mining) CERTIFICATE EXPIRES RICHARD E. MIERITZ DEC. 31, 19— ARIZONA, U.S.A.

$\frac{80' \times 45' w \times 30' h}{12} = 9000$ tons

9000 Tons - 7.0 oz

Samp. Avg. Width 13.8 ft
Weighted Avg. Silver 7.0 (10.4 Use)

ORE RESERVE CALCULATIONS
COLUMBIA-SILVER BELL

Sheet 1

BLOCK NO. Ind. I
LOCATION. No 2 Adit to Surf. (3260)
TYPE Indurated - Siliceous

Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT		Samp. No.	WIDTH Feet	Cunces Silver	PRODUCT
1	11.0	10.2	112.2	21				
2	7.0	9.8	68.6	22				
3	6.0	14.2	85.2	23				
4	12.0	6.6	79.2	24				
5	5.0	13.6	68.0	25				
6	7.0	5.2	31.2	26				
7	9.0	7.0	22.4	27				
8	10.0	5.0	13.2	28				
9	11.0	4.0	31.4	29				
10	12.0	4.0	24.8	30				
11	13.0	4.0	15.8	31				
12	14.0	6.0	11.4	32				
13	15.0	7.0	15.4	33				
14	16.0	5.0	2.8	34				
15	17.0	14.0	13.6	35				
16	18.0	17.0	10.0	36				
17	19.0	14.0	11.8?	37				
18				38				
19				39				
20				40				

No. 2 Adit to Surface

No. 2 Adit to Middle Drift

Sub. above No. 2 Adit

Total 133 / 17 — 1525.2

Total — —
Sub total Col. 1 133 — 1525.2
Total 133 / 17 — 1525.2

100' x 40' x 20h. = 6667 / 12

6667 tons @ 11.5 oz

Samp. Avg. Width 7.8
Weighted Avg. Silver 11.47

Registered Professional Engineer (Mining)
CERTIFICATE EXPIRES
RICHARD E. MIERITZ
DEC. 31, 19--
ARIZONA, U.S.A.

ORE RESERVE CALCULATIONS
COLUMBIA-SILVER BELL

Sheet 1

BLOCK NO. Ind. I.
LOCATION. No 3 Adit Lv. to No. 2 Adit Lv.
TYPE Indicated - Hot Vein

	Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT		Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT
1	36	5.0	2.4	12.0	21	70	8.0	5.8	46.4
2	35	5.0	2.6	13.0	22	71	8.0	10.8	86.4
3	34	7.0	9.0	63.0	23	72	8.0	10.2	81.6
4	33	6.0	11.0	66.0	24	73	7.0	8.6	60.2
5	32	3.0	12.6	37.8	25	74	7.0	8.4	58.8
6	30	3.0	6.0	18.0	26	75	7.0	11.2	78.4
7	88	6.0	10.6	63.6	27				
8	87	5.0	11.2	56.0	28				
9	86	6.0	14.8	88.8	29				
10	85	5.0	13.2	66.0	30				
11	84	6.0	13.6	81.6	31				
12	83	6.0	3.8	22.8	32				
13	82	5.0	8.2	41.0	33				
14	81	6.0	8.6	51.6	34				
15	80				35				
16	79	6.0	4.8	28.8	36				
17	78	7.0	7.6	53.2	37				
18	77	7.0	7.8	54.6	38				
19	68	7.0	11.0	77.0	39				
20	69	8.0	5.4	43.2	40				
	Total	109		938.0		Total	45.0		411.8
						Sub total Col. 1	109.0		938.0
						Total	154.0		1349.8

No. 33 Adit Lv. No. Drift

F.W. - Ore Chute & Raise, No. 33 Adit Lv. to No. 2 Adit Lv.

Registered Professional Engineer (Mining) CERTIFICATE EXPIRES RICHARD E. MIERITZ DEC. 31, 19— ARIZONA, U.S.A.

$$\frac{70' \times 110' \text{ud.}^* \times 6.2}{12} = 3,978$$

25

3,978 tons @ 8.8 oz

Samp. Avg. Width 6.2 ft
Weighted Avg. Silver 8.76

*ud = distance on Slope of F.W.

ORE RESERVE CALCULATIONS
COLUMBIA-SILVER BELL

Sheet 1

BLOCK NO. Ind. III
LOCATION. 4
TYPE Inferred-Main

	Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT		Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT
1	1647	4.5	12.87	57.92	21				
2	1646	4.0	3.76	15.84	22				
3	1645	4.0	13.63	54.52	23				
4	1644	6.5	4.50	29.25	24				
5	1643	6.5	19.67	127.84	25				
6	1642	6.0	1.02	6.12	26				
7					27				
8					28				
9					29				
10					30				
11					31				
12					32				
13					33				
14					34				
15					35				
16					36				
17					37				
18					38				
19					39				
20					40				

Total 31.5 290.71

Total
Sub total Col. 1 31.5 290.71
Total 31.5 290.71

Wid. to F.W. 6

Registered Professional Engineer (Mining)
CERTIFICATE EXPIRES
RICHARD E. MIERITZ
DEC. 31, 19__
ARIZONA, U.S.A.

$\frac{1/2 \times 40 \times 70}{12} = 1213$

1213 tons

Samp. Avg. Width 5.2 ft
Weighted Avg. Silver 9.23 oz

*wd = distance on Slope of F.W.

ORE RESERVE CALCULATIONS
COLUMBIA-SILVER BELL

Sheet 1

BLOCK NO. Int. II
LOCATION. 4th Lv. to No. 3 Adit, So. Drift
TYPE

	Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT		Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT
1	21	5.0	7.6	38.0	21				
2	40	8.0	12.0	96.0	22				
3					23				
4					24				
5					25				
6					26				
7					27				
8					28				
9					29				
10					30				
11					31				
12					32				
13					33				
14					34				
15					35				
16					36				
17					37				
18					38				
19					39				
20					40				

Total 13 | 134.0 | Total ____ | ____

2 = 6.5' | 10.3 | Sub total Col. 1 ____ | ____

use 5' | use 8.5 | Total ____ | ____

$\frac{40' \times 49' ud^* \times 5'}{12} = 816$

816 tons @ 8.5 oz

Samp. Avg. Width 5.0

Weighted Avg. Silver 8.5

*ud = distance on slope of F.W.

Registered Professional Engineer (Mining)
CERTIFICATE EXPIRES
RICHARD E. MIERITZ
DEC. 31, 19--
ARIZONA, U.S.A.

ORE RESERVE CALCULATIONS
COLUMBIA-SILVER BELL

Sheet 1

BLOCK NO. Inf. I
LOCATION Sub Lv. (3195) to Surface (3260)
TYPE Inferred - Main

	Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT		Samp. No.	WIDTH Feet	Cunces Silver	PRODUCT
1	61	7.0	6.6	46.2	21				
2	60	6.0	14.0	84.0	22				
3	59	7.0	8.2	57.4	23				
4	58	6.0	8.0	48.0	24				
5	51	6.0	7.6	45.6	25				
6	52	7.0	9.2	64.4	26				
7	53	6.0	6.8	40.8	27				
8	54	6.0	7.0	42.0	28				
9	55	6.0	4.0	24.0	29				
10	56	5.0	4.4	22.0	30				
11	57	5.0	7.2	36.0	31				
12	1667	3.0	4.7	14.1	32				
13	1668	2.5	13.8	34.5	33				
14					34				
15					35				
16					36				
17					37				
18					38				
19					39				
20					40				
	Total	72.5		559.0		Total			
						Sub total Col. 1	72.5		559.0
						Total 13	72.5		559.0

1 Sub-level (3195)

Registered Professional Engineer (Mining)
CERTIFICATE EXPIRES
RICHARD E. MIERITZ
DEC. 31, 19__
ARIZONA, U.S.A.

$\frac{145' \times 90' ud^* \times 5.6}{12} = 6090$

6090 tons @

Samp. Avg. Width 5.6 ft
Weighted Avg. Silver 7.71

*ud = distance on slope of F.W.

ORE RESERVE CALCULATIONS
COLUMBIA-SILVER BELL

Sheet 1

BLOCK NO. Ind. III
LOCATION. 4th Level to No. 3 Adit - No. Drift.
TYPE Indicated - Main

	Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT		Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT
1	9	6.0	3.2	19.2	21	35	5.0	2.6	13.0
2	8	6.0	1.6	9.6	22	36	5.0	2.4	12.0
3	7	6.0	8.2	49.2	23	37	8.0	1.8	14.4
4	6	6.0	6.8	40.8	24	1614	5.0	4.2	21.0
5	5	7.0	4.6	32.2	25				
6	4	7.0	6.0	42.0	26				
7	3	7.0	4.8	33.6	27				
8	2	6.0	7.0	42.0	28				
9	1	6.0	5.6	33.6	29				
10	23	8.0	8.4	67.2	30				
11	24	6.0	9.0	54.0	31				
12	25	4.0	9.0	36.0	32				
13	26	4.0	9.2	36.8	33				
14	27	4.0	7.8	31.2	34				
15	28	4.0	5.0	20.0	35				
16	29	4.0	9.6	38.4	36				
17	30	3.0	6.0	18.0	37				
18	32	3.0	12.6	37.8	38				
19	33	6.0	11.0	66.0	39				
20	34	7.0	9.0	63.0	40				
	Total	110.0		770.6		Total	23.0		60.4
						Sub total Col. 1	110.0		770.6
						Total	133.0		831.0

No. 3 Adit N. No. Drift.

W. 4th Level to No. 3 Adit

1/2 x 150' x 70' ud x 5.54 = 4847
12

24

4847 Tons. @ 6.25 oz

Samp. Avg. Width 5.54 ft
Weighted Avg. Silver 6.25

Registered Professional Engineer (Mining)
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RICHARD E. MIERITZ
DEC. 31, 19...
ARIZONA, U.S.A.

* ud. = distance on Slope of F.W.

ORE RESERVE CALCULATIONS
COLUMBIA-SILVER BELL

Sheet 1

BLOCK NO. Ind. II
LOCATION. 5th level to 4th lv. So. Drift.
TYPE Indicated. - Main

	Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT		Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT
1	1650	5.5	0.50	2.7	21	31	4.0	13.6	54.4
2	1649	6.6	Tr.	0.0	22	32	4.0	9.6	38.4
3	1648	5.0	8.19	40.95	23	33	6.0	6.4	38.4
4	1647	4.5	12.87	~~57.92~~	24	34	7.0	10.0	70.0
5	1646	4.0	3.76	15.04	25	35	6.0	8.8	52.8
6	1645	4.0	13.63	54.52	26	36	5.0	4.0	20.0
7	1644	6.5	4.50	29.25	27	37	6.0	5.4	32.4
8	1643	6.5	19.67	127.86	28	38	8.0	12.0	96.0
9	1642	6.0	1.02	6.12	29	39	8.0	12.0	96.0
10	20	5.0	4.2	21.0	30	40	8.0	12.0	96.0
11	21	5.0	2.4	12.0	31	1651	4.0	Nil	
12	22	5.0	0.4	2.0	32	1652	4.5	Nil	
13	23	5.0	0.5	2.5	33	1653	5.0	Tr.	
14	24	4.0	2.8	11.2	34	1654	3.75	Tr.	
15	25	4.0	2.0	8.0	35	1655	1.75	1.19	
16	26	4.0	3.0	12.0	36				
17	27	5.0	11.4	57.0	37				
18	28	4.0	8.6	34.4	38				
19	29	4.0	9.8	39.2	39				
20	30	4.0	5.8	23.2	40				
	Total	97.6		556.86		Total	81.0		
						Sub total Col. 1	97.6		556.86
						Total	178.6		1151.26

1 - 5th lv. So. Dr.

1642 - 4th lv. to 5th lv.

5th lv. So. Drift

5th level, So. Drift.

Underhand workings - So. Dr. 4th lv.

200' x 70ud.* x 5.1 / 12 = 5950

5950 tons @

5.95 ft.

Samp. Avg. Width 5.14

Weighted Avg. Silver 6.44

*ud = distance on Slope of F.W.

Registered Professional Engineer (Mining) CERTIFICATE EXPIRES DEC. 31, 19 RICHARD E. MIERITZ ARIZONA, U.S.A.

ORE RESERVE CALCULATIONS
COLUMBIA-SILVER BELL

Sheet I

BLOCK NO. Ind. I.
LOCATION. No 3 Adit to Stub hr (3195) - Sa Drift
TYPE Indicated - Main

	Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT		Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT
1	6	5.0	6.8	34.0	21				
2	7	6.0	9.2	55.2	22				
3	8	6.0	9.4	56.4	23				
4	9	5.0	6.6	33.0	24				
5	10	4.0	8.0	32.0	25				
6	11	6.0	8.0	48.0	26				
7	12	5.0	7.2	36.0	27				
8	13	4.0	7.8	31.2	28				
9	14	5.0	6.4	32.0	29				
10	15	4.0	1.2	4.8	30				
11	16	4.0	4.2	16.8	31				
12	17	4.0	5.8	23.2	32				
13	18	4.0	3.2	12.8	33				
14	19	4.0	5.0	20.0	34				
15	20	5.0	6.8	34.0	35				
16	21	5.0	7.6	38.0	36				
17	16A	2.0	4.11	507.4	37				
18					38				
19					39				
20					40				

Total $\frac{81.0}{17}$ 527.95

Total
Sub total Col. 2 $\frac{81.0}{81.0}$ 527.95
Total $\frac{81.0}{17}$ 527.95
6.52

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DEC. 31, 19
ARIZONA, U.S.A.

$\frac{150' \times 85'ud^* \times 4.76}{12} = 5,057$

5,057 tons @

Samp. Avg. Width 4.76 ft.
Weighted Avg. Silver 6.52

*ud = distance on Slope of FW

ORE RESERVE CALCULATIONS
COLUMBIA-SILVER BELL

Sheet 1

BLOCK NO. M-III
LOCATION. No. 3 Adit to Sub hv. (3195) N. Drift.
TYPE Measured - Main

	Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT		Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT
1	61	7.0	6.6	46.2	21				
2	60	6.0	14.0	84.0	22				
3	59	7.0	8.2	57.4	23				
4	58	6.0	8.0	48.0	24				
5	51	6.0	7.6	45.6	25				
6	63	5.0	3.8	19.0	26				
7	64	6.0	6.4	38.4	27				
8	65	6.0	6.8	40.8	28				
9	66	5.0	9.6	48.0	29				
10	67	5.0	14.8	74.0	30				
11	30	3.0	6.0	18.0	31				
12	32	3.0	12.6	37.8	32				
13	33	6.0	11.0	66.0	33				
14	34	7.0	9.0	63.0	34				
15	35	5.0	2.6	13.0	35				
16	36	5.0	2.4	12.0	36				
17	37	8.0	1.8	14.4	37				
18	38				38				
19	39				39				
20	~~40~~	5.0	4.2		40				

Sub hv - N. of Fr. - Sub hv to No. 3 Adit.

No. 3 Adit hv. N. Drift

Total 92.0 725.6 Total

Sub total Col. 1 92.0 725.6

Total 92.0 725.6

18

Avg. $\frac{70 \times 85 ud^* \times 5.1'}{12} = 2529$

2,529 Tons. @ 7.9 oz

Samp. Avg. Width 5.1 ft

Weighted Avg. Silver 7.9

*ud = distance on slope of F.W.

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CERTIFICATE EXPIRES
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DEC. 31, 19
ARIZONA, U.S.A.

ORE RESERVE CALCULATIONS
COLUMBIA-SILVER BELL

Sheet 1

BLOCK NO. M-II
LOCATION. No. 3 Adit to Sub Level (3195) N. & S. Drifts
TYPE Measured - Main

	Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT		Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT	
1	5	5.0	7.6	38.0	21	55	6.0	6.8	40.8	Sub Lv.
2	4	5.0	7.6	38.0	22	54	6.0	7.0	42.0	
3	3	8.0	12.4	99.2	23	55	6.0	4.0	24.0	
4	2	6.0	7.0	42.0	24	1667	3.0	4.7	14.1	Sub Lv.
5	1	6.0	6.8	40.8	25	1668	2.5	13.78	34.5	
6	23	8.0	8.4	67.2	26	1669	5.0	4.11	20.5	Rz No 3 Adit to Sub-Sta. of Mz.
7	24	6.0	9.0	54.0	27	56	5.0	4.4	22.0	
8	25	4.0	9.0	36.0	28	57	5.0	7.2	36.0	Sub Lv.
9	26	4.0	9.2	36.8	29					
10	27	4.0	7.8	31.2	30					
11	28	4.0	5.0	20.0	31					
12	29	4.0	9.6	38.4	32					
13	67	5.0	14.8	74.0	33					
14	66	5.0	9.6	48.0	34					
15	65	6.0	6.8	40.8	35					
16	64	6.0	6.4	38.4	36					
17	63	5.0	3.8	19.0	37					
18	58	6.0	8.0	48.0	38					
19	51	6.0	7.6	45.6	39					
20	52	7.0	9.2	64.4	40					
	Total	110		984.2		Total	38.5		233.9	
						Sub total Col. 1	110.0		984.2	
						Total	148.5		1218.1	
							28		8.2	

#1 - No 3 Adit - Sub. Dr.
#2 - No 3 Adit - No. Dr.
#3 - Ore Chute No 3 Adit to Sub

$\frac{120' \times 85'ud^{*} \times 5.3'}{12} = 4505$

4,505 Tons

Samp. Avg. Width 5.3 ft
Weighted Avg. Silver 8.2 oz

Registered Professional Engineer (Mining) CERTIFICATE EXPIRES RICHARD E. MIERITZ DEC. 31, 19— ARIZONA, U.S.A.

*ud = distance on slope of F.W.

ORE RESERVE CALCULATIONS
COLUMBIA-SILVER BELL

BLOCK NO. M-1
LOCATION. 4th Lv to No 3 Adit - So Drift
TYPE Measured - Main

Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT		Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT
1	3	6.0	12.4	74.4	21			
2	4	5.0	7.6	38.0	22			
3	5	5.0	7.6	38.0	23			
4	6	5.0	6.8	34.0	24			
5	7	6.0	9.2	55.2	25			
6	8	6.0	9.4	56.4	26			
7	9	5.0	6.6	33.0	27			
8	10	4.0	8.0	32.0	28			
9	11	6.0	8.0	48.0	29			
10	12	5.0	7.2	36.0	30			
11	13	4.0	7.8	31.2	31			
12	14	5.0	6.4	32.0	32			
13	15	4.0	1.2	4.8	33			
14	16	4.0	4.2	16.8	34			
15	17	4.0	5.8	23.2	35			
16	18	4.0	3.2	12.8	36			
17	19	4.0	5.0	20.0	37			
18	20	5.0	6.8	34.0	38			
19	21	5.0	7.6	38.0	39			
20					40			1549.7
Total	92		657.8		Total	226		~~1578~~
					Sub total Col. 1	92		657.8
					Total	318		2207.5

59 = 6.94

Samp. Avg. Width 5.39'
Weighted Avg. Silver 6.94

No-3 Adit W - So Drift

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ORE RESERVE CALCULATIONS
COLUMBIA-SILVER BELL

Sheet 2

BLOCK NO. M-I
LOCATION, 4th Level to No 3 Adit-90 Drift.
TYPE Measured - Main

	Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT		Samp. No.	WIDTH Feet	Ounces Silver	PRODUCT
1	20	5.0	4.2	21.0	21	40	8.0	12.0	96.0
2	21	5.0	2.4	12.0	22	43	7.0	10.6	74.2
3	22	5.0	0.4	2.0	23	44	6.0	5.6	33.6
4	23	5.0	0.5	2.5	24	45	6.0	5.8	34.8
5	24	4.0	2.8	11.2	25	49	5.0	8.4	42.0
6	25	4.0	2.0	8.0	26	50	6.0	9.8	58.8
7	26	4.0	3.0	12.0	27	51	5.0	8.8	44.0
8	27	5.0	11.4	57.0	28	52	5.0	4.4	22.0
9	28	4.0	8.6	34.4	29	53	6.0	6.4	38.4
10	29	4.0	9.8	39.2	30	9	6.0	3.2	19.2
11	30	4.0	5.8	23.2	31	8	6.0	1.6	9.6
12	31	4.0	13.6	54.4	32	7	6.0	8.2	49.2
13	32	4.0	9.6	38.4	33	6	6.0	6.8	40.8
14	33	6.0	6.4	38.4	34	5	7.0	4.6	32.2
15	34	7.0	10.0	70.0	35	4	7.0	6.0	42.0
16	35	6.0	8.8	52.8	36	3	7.0	4.8	33.6
17	36	5.0	4.0	20.0	37	2	6.0	7.0	42.0
18	37	6.0	5.4	32.4	38	1	6.0	5.6	33.6
19	38	8.0	12.0	96.0	39	1	6.0	6.8	40.8
20	39	8.0	12.0	96.0	40	2	6.0	7.0	42.0
	Total	103		720.9		Total	123		828.8
						Sub total Col. 2	103		720.9
						Total	226		1549.7

4th Lev. So

S 30° W 94 ft

S 15° W 114 ft

S 6° W 94 ft

S 19° W 47 ft

Level Drift

No. 3 Adit Lev - 10 ft to So.

$$\frac{200' \times 70 \text{ u.d.}^* \times 5.39}{12} =$$

6,288 tons @ 6.94 oz

Avg. Width 5.39'

Weighted Avg. Silver 6.94

Registered Professional Engineer (Mining)
CERTIFICATE EXPIRES
RICHARD E. MIERLE
DEC. 31, 19
ARIZONA, U.S.A.

* u.d. = distance on slope of F.W.

IRON KING ASSAY OFFICE

ASSAY CERTIFICATE

BOX 14
HUMBOLDT, ARIZONA 86329

RICHARD MIERITZ
2940 N Casa Tomas
Phoenix, Ariz. 85016

Signed 5/20/80

SUBMITTED BY:

May 20, 1980

Ref no.	DESCRIPTION	oz/ton Au	oz/ton Ag		% Fe	% Pb	% Zn	% Cu
04-30-8	#1784	Tr	1.56	Pit on S.B. - 300'S of NO3 Adit				
04-30-9	#1785	Tr	Nil	chip of outcrop - No Mineral.				
04-30-10	#1786	Tr	7.10	5' chip in hole opened by dozer - in open Pit.		1.75		
04-30-11	#1787	.012	6.61	grab of Hi grade in Glory hole on Pit		38.3	Surface	5.60
04-30-12	#1788	Nil	Nil	chip of outcrop - See Map "B"				
04-30-13	#1789	.004	Tr	chip in Pit, N of Martinez Canyon				Map "B"
04-30-14	#1790	.004	Nil	Jet frac structures See Map "B"				
$59.75								

AN

INTERIM GEOLOGICAL REPORT

on the

SILVER BELL-COLUMBIA - MARTINEZ MINING PROPERTY

in the

Pioneer Mining District
Pinal County, Arizona

by

Richard E. Mieritz
Mining Consultant
Phoenix, Arizona

May 4, 1980

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INCLUDED EXHIBITS

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Map A - Regional Geology and Index Map
Map B - Surface Geology Map - Silver Bell-Columbia - Martinez

Bound Separately:

Map No. 4A - Underground Working Composite
Map No. 5 - Geologic Map - No. 2 Adit Level
Map No. 5A - Geologic Map - 3220 Sub Level
Map No. 6 - Geologic Map - 3195 Sub Level
Map No. 7 - Geologic Map - No. 3 Adit Level
Map No. 8 - Geologic Map - 4th Level
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Map No.10 - Sample Assay Map - No. 2 Adit Level
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Map No.21 - Cross Section 25 + 50
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Map No.25 - Cross Section 27 + 50
Map No.26 - Cross Section 28 + 00
Map No.27 - Cross Section 28 + 50
Map No.28 - Cross Section 29 + 00
Map No.29 - Cross Section 29 + 50
Map No.30 - Cross Section 30 + 00

INTRODUCTION:

At the request of and authorization by Mr. Don Coleman, Coleman Exploration and Mining - S.B., the writer has undertaken the preparation of an interim Geological Report of the Silver Bell-Columbia, Martinez mining property in the Pioneer Mining District, Pinal County, Arizona.

The writer has recently geologically mapped most of the underground workings of the Silver Bell-Columbia mine and also some of the surface, primarily as related to structural features. Surface geological mapping of rock types was partially completed where the "obvious" was observed.

GENERAL GEOLOGY:

The twenty eight claims - three of which are patented - are located in parts of Sections 7, 8, 17, 18, 19 and 20 of T. 3 S., R. 12 E. and part of Sections 13 and 24 of T. 3 S., R. 11 E. Sections 7, 18 and 19 of T. 3 S., R. 12 E. are short Sections east-west, being about 3,350 feet long.

The property lies entirely in a complex of Tertiary dikes and plugs as shown and defined on the Geological Map of Pinal County, Arizona prepared by the Arizona Bureau of Mines, University of Arizona, Tucson, Arizona, in cooperation with the U.S. Geological Survey.

Classification of the common rock within the property is rhyolite and it has many phases, many colors and various mineral constituents to create different physical appearances and characteristics.

Dikes or plugs of diabase, andesite and diorite are present. Remnants of the Gila Conglomerate are also present. Most of the rocks are fresh but strong alteration is also present, particularly in and near the structural features.

Rocks surrounding the Tertiary dike - plug area are Tertiary sand, gravel and conglomerate to the southeast with older pre-Cambrian granite to the south and the Pinal Schist to the north and northwest.

The rhyolite within the property assumes many colors from pink, tan, brown, sometimes red and also white. Such coloration is due to the varying amounts of the "dead" iron oxide constituent.

The rock type does not influence the mineralization within the claims; viz., mineralization favors the structural features within the area, not rock types.

STRUCTURAL FEATURES:

The abundance and mass of the single rock rhyolite might be termed a huge "core", "plug" or even a dike which invaded much of the Tertiary

dacite, The high angle dipping flow lines observed create a steep, rugged topography of near vertical cliffs, church steeples and pinnacles, as well as steep sided, high gradient canyons and drainage system. This rugged terrain creates Martinez Canyon and Wild Horse Canyon. (See Geological Map B)

There are many structural features, most of which tend to follow a N.10°-25°W. direction. This group has westerly dips ranging from 40° to 55° and sometimes to high angle dips of 70° to 80°. The same structure may have both dips, particularly when it changes strike where the dip will tend to steepen to the high angle figures. (See Geological Map B.) A second set of structures of lesser frequencies trend toward a N.-S. direction and usually assume the high angle dip. The exception to this is the Martinez structure and in part, the Silver Bell-Columbia structure.

Most of the structures are mineralized, at least with limonitic iron oxides, sometimes showing heavy concentrations. The observed and mapped structures are both narrow (6 inches) and wide (25 feet at Silver Bell).

The two strongest structures thus far observed are the Silver Bell-Columbia which the writer traced and mapped for about 3,600 feet along the strike from the No. 2 Adit Level portal of the Silver Bell mine south to where it crosses Martinez Canyon. The Martinez structure has been traced on the surface for about 1,700 feet.

Mapping of the structures thus far indicates a loci point of structure junctioning about 1,600 feet south of the portal of No. 3 Adit Level of the Columbia mine and about 1,700 feet north-northwest of the Martinez shaft.

It is in this area that ASARCO drilled two 600 foot deep vertical holes and one 900 foot deep vertical hole. The hole bottoms would thus be about the elevation of Martinez Canyon at a point due south of the hole locations. The deeper hole would bottom about 300 feet below the canyon floor elevation.

Silver Bell-Columbia Structure:

Silver, lead and copper mineralization at this mining property is thus far - to our knowledge - confined to and limited to the vein type. The strongest and most prominent structure is the Silver Bell-Columbia.

Although this structure weaves in direction and dip, its general trend is N.15°W. and it dips 45°-55° to the west. For the most part, particularly at the mine, the structure is a shear zone of up to 25 or 30 feet in width, with good slick footwall and a well defined hanging wall. The underground workings at the mine expose a great portion of the structure from the foot to the hanging walls and where observable and mapped, the usual accompanying strained ellipsoid pattern of relief structures is present, both along the strike and dip. For the most part, also, a structure midway between the foot and hanging wall is usually quite parallel in strike and persistence, but it does junction with both walls, sometimes creating a "false" footwall which previous

operators tended to follow and caused some weaving of the drifts.

The hanging wall of the structure is present - for the most part of its strike, at the base of the cliff or shear vertical wall of the rock ridge from the mine southward to its intersection with Martinez Canyon at the lower elevation.

The Silver Bell structure is known to exist southward up the south bank of Martinez Canyon for 1,000 feet or more. This structure starts to "split" and dies to the north of the No. 2 Adit Level portal as evidenced on the surface and the underground workings. (See Geological Map B and Level Geological Maps Nos. 5, 5A, 6, 7, 8 and 9.)

Martinez Structure:

This structure is a "secondary" structure as compared to the strength and other physical geological characteristics of the Silver Bell-Columbia structure.

Strike-wise, on the surface it is quite consistent at a N-S direction but a variable declining dip from 51° to 54°W. at the Martinez shaft to 27°W. at its north end - about 1,500 feet north of the shaft where it tends to "die" or lose its strength.

The writer's "early" surveying and mapping of the 200 Level definitely shows a "weaving" of both the strike and dip - similar to the Silver Bell-Columbia structure.

MINERALIZATION:

Rock mineralization consists mostly of associated "dead" limonitic iron oxide, some silicification, some quartz and occasionally a small amount of calcite.

Metal mineralization (lead, silver and copper) along with the usual accessory minerals, is confined to the structural features and to a degree an impregnation into the surrounding rocks where metal mineralization has been quite intense.

Silver Bell-Columbia:

The Silver Bell-Columbia structure is a shear zone, quite highly fractured within its walls, therefore, quite an accessible channel way and host for mineral deposition.

"Live", vari-colored iron oxide limonites dominate the interstices or voids of the fractures within the zone. Second to the iron oxide is silver mineralization followed by lead and some copper mineralization. Other associated minerals in very minor amounts are calcite, quartz, fluorspar, barite, manganese and even tungsten, all considered as the "oxide" group.

The Silver Bell-Columbia mineralization is considered - to its present

5th Level - a high silver - low lead situation. Silver minerals include the bromides and chlorides and the sulphide argentite, the latter most difficult to distinguish because of the heavy limonitic orange-brown-red-black limonite coloring. The bromides and chlorides are usually identified by their typical apple green-canary yellow coloring. The lead is usually present as "galena goose-eggs", the sulphide, or as the carbonate cerussite, the sulphate anglesite or even plumbojarosite - a hydroxide-sulphate of lead.

Because the limonitic coloring hides the presence and recognition of the silver and lead minerals (exceptions, galena, bromides and chlorides) the strength of metal content must be by assay - and assay alone. An experienced person can "eyeball" the higher grade silver material - ore - but to distinguish waste from good mill ore is most difficult except by assay.

The Silver Bell-Columbia mine area has five distinct ore types, known as:

(1) Siliceous ore - Pit area
(2) Grey ore - near surface - Pit area
(3) Maroon ore - near surface - Pit area
(4) Hot Vein ore - Surface to No. 3 Adit Level
(5) Vein ore - Surface to 5th Level

Ores 1, 2 and 3 appear to be quite limited in volume, being close to the surface (Pit area). Examination of these ores on the No. 2 Adit Level workings is greatly limited because of much "backfill" and/or ore pass filling by surface material resulting from the past surface mining operation.

The siliceous ore is an impregnation of silver minerals into a localized silicified rhyolite limited on the east by the vertical fault creating the east bank of the Pit-trench and the hanging wall of the Silver Bell-Columbia structure. It is likely that it adjoins the southern limit of the "grey ore" to the north and northwest and is differentiated by the moderately steep, meandering fault which creates the east bank of the road incline from the No. 2 Adit Level elevation (3240) up to the Pit floor elevation (-3303).

The "grey ore" is an altered white-grey-pink rhyolite, highly fractured and quite friable. It is controlled by the above mentioned meandering fault and pinches to the south as this fault joins the footwall of the Silver Bell-Columbia structure.

The "maroon ore" is actually part of the Silver Bell-Columbia structure but apparently was so named because of its color - created by a greater amount of red (maroon) "live" iron oxide limonite than in the structure below the No. 2 Adit Level workings.

Silver mineralization is usually only visible in the "grey ore" because of the light colored rock and the green-yellow color of the silver bromide-chloride minerals.

The "Hot Vein", a strained ellipsoid complement structure is thought by the writer to join the hanging and footwalls of the Silver Bell-Columbia structure along the strike and down dip. These junctions

are not clearly defined except on the No. 3 Adit Level in the 2nd crosscut at the Ore Pass chute near the north drift. Inaccessibility to some of the workings is the reason for lack of information.

Physical characteristic-wise, the "Hot Vein" ore basically is no different than the Silver Bell-Columbia ore except it does exhibit some injected crystalized quartz as void filling and usually carries a bit more silver value, some bromides, chlorides and galena. The "Hot Vein" appears to "lie" upon the Vein Ore near the hanging wall on the No. 2 Adit Level while joining the footwall on the No. 3 Adit Level.

Vein ore within the Silver Bell-Columbia structure comprises the bulk of the present ore reserve and should be carefully studied - characteristically. This ore contains much "live" orange, brown, red, purple and black iron oxide limonites. The intensity of these limonites usually will indicate the possible strength of the silver content. The writer is of the opinion that the middle fault (between the foot and the hanging walls) is the primary access route of the mineralization. Most frequently, the mineralization favors the zone between the footwall of the Silver Bell-Columbia structure and the middle structure. Occasionally, the mineralization will strongly favor the hanging walls and this is usually controlled when the middle fault bends to join either the footwall or the hanging wall of the Vein Ore. This condition can exist along the strike or up and down dip.

Although not completely proven, it is however indicated that when the mineralization favors the footwall zone, the hanging wall zone is also mineralized but somewhat weaker. When the hanging wall zone is well mineralized, the footwall zone is also mineralized but somewhat weaker. In both cases, the weaker mineralization appears to be progressively gradational downward from the middle fault. This is not a "hard and fast" rule, merely an indicated trend.

Silver values in the Vein Ore are persistent throughout the length of the present development.

Martinez:

The Martinez structure is basically a vein containing a sugary type quartz gangue as fracture fillings and replacement, galena, argentite, some copper oxides, sulphides also, and minor associated minerals as calcite, fluorspar, barite, etc. "Live" brown, red and black iron oxide limonites are quite abundant.

Past ore production from the Martinez has been a high lead, low silver material from stopes which have a greater dip length than strike length. Lead-silver mineralization here is not continuously persistent along the strike as the Silver Bell-Columbia structure.

High grade ore shoots are usually 40 to 50 feet long on the strike with low grade lead concentrations which range from 40 to in excess of 120 feet in length between the shoots.

The Martinez is a "wet mine" as contrasted to the dryness of the Silver Bell-Columbia mine. The writer is of the opinion that the mine can

provide 15-20 GPM water on a continuous 24 hour pumping cycle. The mine has a reserve capacity of 350,000 to 400,000 gallons.

PROPERTY POTENTIAL:

The mineral potential on the property is great. The Silver Bell-Columbia structure has a visible unexplored strike length of 3,000 feet and a dip length (below the No. 3 Adit Level elevation) of at least 500 feet, perhaps more.

The Martinez mine has approximately a 700 foot unexplored strike length to the north of the "Wingfield" decline shaft on the north side of Martinez Canyon. The writer opines that a 200 foot dip length extension below the 200 ft. Level is not unreasonable.

Aside from these two structures and the claims involved, all the outlying claims have minor occurrences of lead-silver-copper mineralization present. Such occurrences should be prospected to a degree.

EXPLORATION:

The Silver Bell-Columbia structure has the greatest potential of ore development and exploration is definitely justified. Exploration is best done by underground drifting on the Vein.

The No. 3 Adit Level is the most southerly advanced drift. Efforts should be made to advance this drift to "sunlight" which should be at a point about 220 feet S.40^{o}W. of the portal of the No. 3 Adit Level, near the base of the rock cliff.

Secondly, the 3195 Sublevel should be driven from the raise near the No. 3 Adit Level shaft in a southerly direction to "sunlight."

Driving of the 4th Level is not recommended at this time.

As mentioned earlier, weaker silver mineralization is sometimes present in either the hanging wall side or the footwall side - opposite stronger silver mineralization in the Vein. Where this criteria is exhibited, long hole (10-15 feet) sample drilling should be completed to determine the strength and width of such mineralization. This should be done in many places in the drifts, raises and stopes, throughout the mine and as drifts are advanced into new unexplored areas. Drill hole data - location, depths, assays, etc. should be kept.

MINING:

The writer's Ore Reserve calculations of February 1980 showed various blocks of measured, indicated and inferred ore in the present mine workings from the surface down to the 5th Level.

Ore can be mined from any one or all of these blocks and transferring such mined ore to the No. 3 Adit Level chute system and tramming same through the haulage drift of the No. 3 Adit Level.

Open pit mining of the siliceous ore, grey ore and the maroon ore is not recommended.

MAPS:

The writer has prepared a set of Maps (separate binding) which include but are not limited to a Surface Geology Map, six Level Maps of the underground workings showing the mapped Geology, ten Vertical Sections showing the mapped Geology and some sample silver assays and six Level Maps of the underground workings showing the silver assay values of Starbird's samples and samples taken by Coleman Exploration and Mining, S.B.

The writer has used a coloring scheme on the Sample-Assay Level Maps and the Vertical Sections to show the horizontal and vertical distribution - as reasonable as possible - of the silver values.

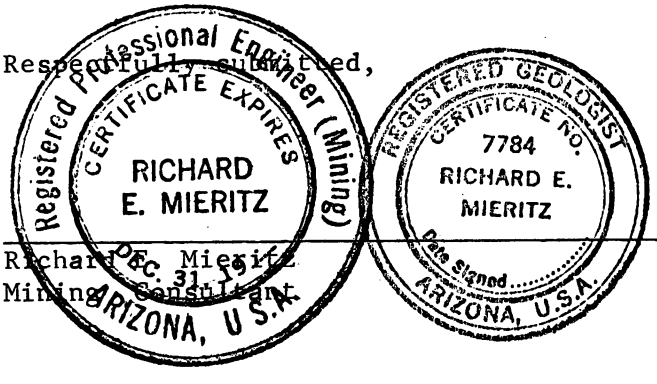
Each color denotes a range of values as follows:

6.0 ounces or more silver	Red
4.0 to 5.99 ounces silver	Green
2.0 to 3.99 ounces silver	Yellow
1.0 to 1.99 ounces silver	Blue

No coloring denotes either no information available or the silver value is less than 1.0 ounce per ton. Where silver mineralization in excess of four ounces is known or suspected of being present (no assay values) - the area is thusly shaded a pink color.

Faults are colored with dark blue ink and projected where the writer has sufficient evidence that the projection is justified - particularly on the Geological Sections.

Respectfully submitted,



Richard E. Mieritz
Mining Consultant

May 4, 1980

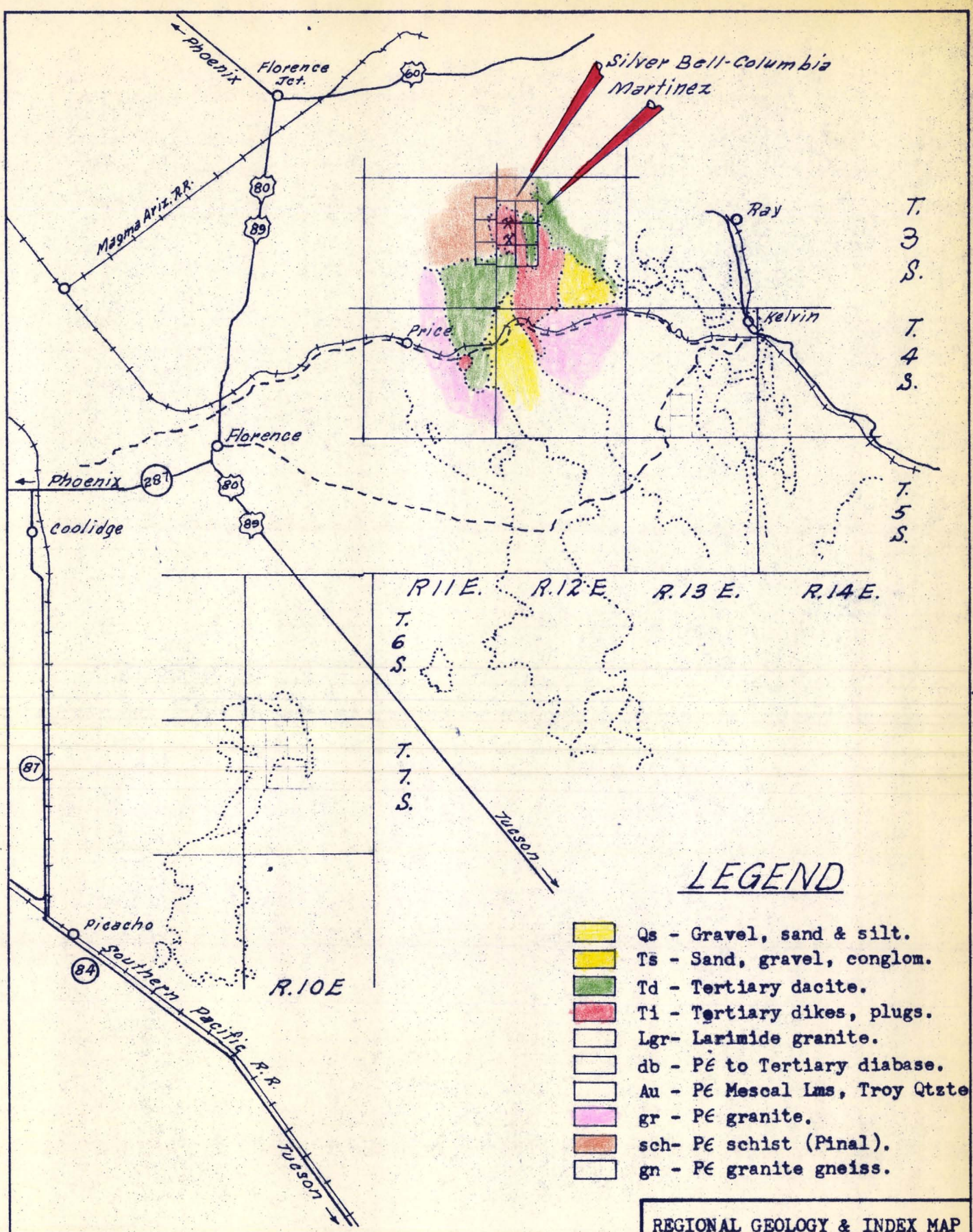
SILVER BELL - COLUMBIA SAMPLES
(taken during April, '80)

Sample No.	Sample Location and Description	Ounces/Ton Gold	Silver	% Lead
1744	5th Lv., So. Face, 3.7 ft. Hor.	Nil	0.02	
1745	4th Lv. So. drift, E. Raise face, 3.4 ft. Vertical	"	4.74	0.10
1746	No 2 Adit L., 1st Xcut E., N. wall, 4.6 ft. normal to dip	"	5.06	
1747	No. 2 Adit Lv. 1st E. Xcut, face, 4.0 ft. Hor.	"	3.58	
1748	No. 2 Adit Lv. Drift, E. wall at old sample #27, 5.5 ft. Vert.	Tr.	6.84	
1749	No. 2 Adit Lv., 2nd W. Xcut, N. corner of junction with drift.	Nil	3.36	
1750	No. 2 Adit Lv., 2nd W. Xcut, N. wall, at 10 feet, 5.6 ft. Vert.	"	5.06	
1751	No. 2 Adit Lv., 2nd W. Xcut, N. wall, at 15 feet, 4.0 ft. Vert.	"	4.88	
1752	3195 Sub. Lv., W. Xcut, N. drift, S. wall, 3 ft across fault zone	"	7.22	
1753	No. 2 Adit Lv., SW Xcut to Hot stope, NW wall, 0 to 5 feet, Hor.	Tr.	7.40	
1754	No. 2 Adit Lv., " " " " " 5 to 10 feet, Hor.	Nil	4.00	
1755	No. 2 Adit Lv., " " " " " 10 to 15 feet, Hor.	"	3.08	
1756	No. 2 Adit Lv., " " " " " 15 to 18 feet, Hor.	"	3.04	
1757	No. 2 Adit Lv., " " " " " 18 to 23 feet, Hor.	"	3.40	
1758	No. 2 Adit Lv., 4th E. Xcut, S. wall at 3rd E. drift, 0 to 5 feet., Hor.	"	4.68	
1759	No. 2 Adit Lv., " " " " " 5 to 10 feet, Hor.	"	2.90	
1760	3220 Sub Lv., S. drift, N. wall, Winze bottom, 5 feet, Hor.	"	Nil	
1761	3220 Sub. Lv., S. drift, W. wall, 8 feet S. of S. winze wall, 5 feet, Vert.	"	1.92	
1762	3220 Sub. Lv., S. drift, E. wall at old sample #43, 6 feet Vert.	"	0.02	
1763	3220 Sub. Lv., drift S. of Raise from 3195 Sub., E. wall, 3 feet Vert.	Tr.	11.16	
1764	3220 Sub. Lv., drift N. of Raise from 3195 Sub., W. wall at face, 3.3 feet Vert., @#49	"	7.52	
1765	No. 2 Adit Lv., 3rd E. drift, W. wall, 7 feet N. of Winze, 5.4 feet Vert.	Nil	11.68	
1766	Ore Pass muck, Glory Hole to 300 Lv., grab of muck. No. 2 Adit Lv.	Tr.	3.94	
1767	No. 2 Adit Lv., Hot Vein area, E. drift, N. wall, at old # 75, 3.0 feet Vert.	Nil	9.44	
1768	No. 2 Adit Lv., " " " , between 2nd and 3rd drifts E., 4 feet, near floor, Vert	Tr	12.70	
1769	Ore Pass muck, like 1766 but on W. side, grab of muck., No. 2 Adit Lv.	Tr.	3.16	
1770	Ore Pass muck, like 1769 but on N. side, grab of muck., No. 2 Adit Lv.	Nil	2.70	

Note: Samples assayed by Iron King Assay Office, Humboldt, Arizona

SILVER BELL - COLUMBIA SAMPLES
(taken during April, '80)

Sample No.	Sample Location and Description	Ounces/Ton Gold	Silver	% Lead
1771	No. 2 Adit Lv., 2nd E. Xcut, 2nd E. drift, Raise to surface, Grab of muck	Nil	2.46	
1772	No. 3 Adit Lv., Haulage drift, 3rd W. Xcut, Grab of muck	Tr.	5.20	
1773	No. 3 Adit Lv., Haulage drift, at old sample #56, E. wall, 5.5 ft, Vert.	Nil	Nil	
1774	No. 3 Adit Lv., Haulage drift, at old sample #60, E. wall, 5.4 ft, Vert.	Nil	Nil	
1775	No. 3 Adit Lv., Haulage drift, face, 1.5 feet Hor. between faults	Nil	Nil	
1776	No. 3 Adit Lv., N. drift, Hot Vein chute, grab of muck.	Tr.	8.29	
1777	No. 3 Adit Lv., N. drift, 2nd Xcut (hot Vein chute), N. wall, 3.5 feet Vert.	Tr.	5.00	
1778	Surface, Silver Bell-Columbia Vein outcrop, at approx. elevation of No. 3 Adit Lv. 0.5 feet, chip sample.	Nil	0.12	
1779	Dump at No. 3 Adit Level. West end, 0 to 5 feet, Hor.	Nil	2.24	
1780	" " " " 5 to 10 feet, Hor.	"	1.00	
1781	" " " " 10 to 15 feet, Hor.	Tr.	0.98	
1782	" " " " 15 to 20 feet, Hor.	Nil	1.78	
1783	" " " " East end,20 to 25 feet, Hor.	Nil	1.08	



LEGEND

- Qs - Gravel, sand & silt.
- Ts - Sand, gravel, conglom.
- Td - Tertiary dacite.
- Ti - Tertiary dikes, plugs.
- Lgr- Larimide granite.
- db - Pє to Tertiary diabase.
- Au - Pє Mescal Lms, Troy Qtzte
- gr - Pє granite.
- sch- Pє schist (Pinal).
- gn - Pє granite gneiss.

REGIONAL GEOLOGY & INDEX MAP
(Portion of)
CENTRAL PINAL COUNTY, ARIZONA

SCALE: 1"= 6 Miles

Dec., 1973 R. E. Mieritz

MAP No. 4

COLEMAN EXPLORATION & MINING CO.

COLUMBIA — SILVER BELL MINE
SURFACE GEOLOGY MAP

Pioneer Mining District

Pinal County, Arizona

SCALE: 1" = 400 FT.

0 100 200 400 800 1200

APR., 1980 R.E. MIERITZ

MAP Nº B