REPORT ON

RED CLOUD GOLD MINE

MARIPOSA COUNTY, CALIFORNIA

By

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Reno, Nevada

December, 1987

INTRODUCTION

The writer visited the Red Cloud Mine twice; the first visit on September 29, 1987 accompanied by Mr. Ray Schilber and the second visit on November 4, 1987 accompanied by Mr. & Mrs. Robert (Lois) Ardery and Mr. Ray Schilber. The purpose of these visits were to carry out a preliminary mine examination in order to attempt an estimation of the in-place value of the mining property.

LOCATION & ACCESSIBILITY

The Red Cloud Mine is located approximately eight miles east of Coulterville which is seated on the California Route 132 approx. 55 miles east Modesto, California. The mine can be reached by the paved Route 132 approx. 8 miles to east from Coulterville and by a County dirt road approx. two miles. The accessibility of the mining property, thus is excellent year round (Figure 1).

CLAIMS & OWNERSHIP

The Red Cloud Mine consists of 21.5 acres of a patented claim and 100 acres of five unpatented claims which are situated in Sections 22 and 27, T 2 S, R 17 E, Mount Diablo Meridans, in Red Cloud Mining District, Mariposa County, California. The patented claim is owned by Mrs. Lois Ardery and Mr. Ray Schilber, 50% each, and the unpatented claims are owned by Mr. Ray Schilber (Figure 2).

TOPOGRAPHY & GEOLOGY

The average elevation of the mine is approx. 3,000' above sea level with a moderately sloping ridge and two gulches at north and south of the mine. In general, the claims are covered with good timbers and brushes. The topographic map (1) of the mine vicinity is shown in Figure 3.

The regional geology of the mine area is consists of rather a complex formations. The Jurasic and Paleozoic marine sedimentary and metasedimentary rocks and the Jura-Trias metavolcanic rocks are the predominant formations, where as the Mesozoic granitic rocks, Mesozoic ultrabasic intrusive rocks,

and the Pre-Cretaceous metavolcanic rocks are the minor group formations of the region(2). The geologic map and explanations are given in Figure 4 and Table I respectively.

The country rock or wall rock of the mine is the slate of the Mariposa Formation and/or the quartz-mica schist of the Calavaras Formation. The mineral deposit of the mine can be classified into two types of ore deposit, i. e. (a) gold/silver bearing quartz vein(s), and (b) gold/silver bearing disseminated wall rocks. The vein rock is a milky quartz mixed with brecciated wall rocks and the average width is approx. 5' with average grade of one oz. per ton Au. The general strike of the vein is N 40° E with Approx. 70° E dip(Figure 2). The average width of the disseminated wall rock ore is approx. 5' at both the hanging and foot walls(Figure 5).

HISTORICAL REVIEW

Past Work

A comprehensive report on the Red Cloud Mine was published in the California Journal of Mines & Geology(3) which is quoted in the following:

"The Red Cloud mine was discovered prior to 1880 but the principal period of operation was 1885-1895 when most of the workings were driven and most of the production made. Castello (1921, p. 135) reports the estimated production to be about $1,500,000 but there are no records to substantiate this claim. In 1885 the mine was owned by Gaines and Carter of San Jose, California (Min. and Sci. Press, vol. 51, no 7, p. 120, 1885). J. S. Carter was mine manager and R. B. Harper and John Guest were superintendents at various times under Carter. The shaft was down 360 feet late in 1885, was deepened in 1886 to 430 feet and again in 1893 to 700 feet. A 22-stamp mill was operating on the property in 1889 but fell idle soon thereafter, steampowered. The operator in the middle 1890s was the Red Cloud Mining Company of Boston. Two short ore shoots were followed down to the 500 level during operation by Gaines and Carter, but these were lost between the 600 and 700 levels and the Red Mill Mining Company was reported to have spent $60,000 in fruitless exploration between the 600 and 700 levels (Min. and Sci. Press, vol. 80, no. 11, p. 265, 1900). In 1900 the property was optioned to A. P. Dron of Big Oak Flat but was not put into production. The owner in 1904 was Mrs. E. Whitman of Coulterville (Wilkinson, 1904, p. 13). By 1920 ownership of the mine had passed to Mrs.

Table 1. Explannation of Geological Map.

IP   Paleozoic marine sedimentary and metasedimentary rocks:

                Calaveras formation (general name for Sierra Nevada
               Paleozoic rocks) - quartz-mica schist, slate, quartzite,
                        and metachert.

Ju   Upper Jurassic marine sedimentary and meta sedimentary rocks:

                Mariposa formation - slate, locally tuffaceous metasandstone,
               metagraywacke, metaconglomerate, metasiltstone, and minor
               sandy metatuff.

Gr   Jurassic, undifferentiated:

                Various granitic rocks in the Sierra Nevada, including
               granodiorite, quartz diorite, pegmatite, aplite, and some
               gabro(not differentiaed into separate cartographic units).

mv   Pre-Cretaceous metavolcanic rocks:

                Dark green fibrous amphibolite schist and sericite schist
               (Sierra Nevada)

ub   Mesozoic ultrabasic intrusive rocks:

                In Sierra Nevada - massive serpentine, hornblendite,
               silica-carbonate rock associated with serpentine, peridotite,
               and gabro.

JRv   Jurassic and/or Triassic metavolcanic rocks:

                Penyon Blanco volcanics - massive metavolcanic rocks,
               including local mafic pillow lava and metachert.

Emma McDiermid of Coulterville who retained possession of the mine through-out the 1920s. In 1935 the mine was leased for a short time by Fredericks and Hodge of Mariposa. The authors know of no active mining at property since 1935.

"The vein at the Red Cloud Mine strikes N. 40o E. and dips 60-80o north. Wall rocks are slaty metas-ediments of the Paleozoic Calaveras group. The vein averages about 5 feet wide, locally reaching a width of .15 feet. Vein matter is milky quartz with inclusions of brecciated wall rocks, locally banded or ribboned. Two ore shoots each about 400 feet long were worked in the upper levels to a depth of over 500 feet, ore being 3-5 feet thick. In the middle 1880s ore was running about $30 per ton mostly from native gold. The average content of sulfides was about 2-1/2 percent, auriferous pyrite concentrates running between $100 and $200 per ton (Goodyear, 1888, p. 345). The vein is traceable for a distance of more than 4500 feet and the original property consisted of 3 claims oriented end to end on the main vein and a 4th claim near the east end of the vein at approximately right angles to the main vein. Apparently an intersecting or cutter vein was located in the workings which does not show at the surface.

"Mine workings consist of a 8 x 10-foot inclined shaft 700 feet deep with levels at intervals of 100 feet. Most of the stoping has been done above the 500-foot level. Drifts aggregate more than 500 feet. The workings were all caved and inaccessible in October 1954."

Present Work

Since the Red Cloud Mine was acquired by the present owners in early 1979, an extensive exploration and development works were performed as follows:

1. EM-16 Electromagnetic Survey.

In July 1980 an EM-16 Electromagnetic survey was carried out by the Mining Enterprises and located one strong, one moderate, and two weak anomalies as illustrated in Figure 2. The summaries of the report on the EM-16 survey is given in Appendix A.

2. Test Drilling.

In order to confirm the EM-16 survey results, a test drilling project was performed in February 1981 by drilling three holes, two hles at the north and south ends of the strong anomaly zone and one check hole outside of the anomaly zone as shown in Figure 2. The drill logs and the assay

results are given in Appendix B. It should be noted that the Hole No. 1 and Hole No. 2 which were located in the anomaly zone drilled through the disseminated ore in the wall rocks, rather than the quartz vein. The Hole No. 3 was drilled outside the anomaly zone or nonmineralized zone(no assay record).

3. Development Work.

An extensive development work was carried out by the present owners since early spring of 1985 as follows:

a. Shaft Installation. A single compartment, 110' deep, 70° E. incline shaft was installed following the vein with a 40' collar and timber lining the shaft. A 140 cu-in Volvo Industrial engine is installed for hoisting one-ton ore car in the skip. The mine power is supplied by a 60 KW and a 40 KW disel generators. A 2,000 gph pump is installed in the shaft in order to drain the mine water of 1,500 gpd flow rate at the present. However, the mine water flow rate is expected to be increased as the mine development work progresses. Nevertheless, the mine water is the main water source of the mine operations.

b. Pilot Mill Plant. A 25 ton/day pilot mill plant has been installed in order to perform testing works for gold/silver recovery processes of both the quartz vein and wall rock ores. The pilot plant consists of primarily a jaw crusher, a ball mill, a Denver Gold Trapper, flotation cells, and a Wilfley table. The testing works are being conducted with assistance and cooperation of the Sonora Gold Mine metallurgists.

The shaft and the pilot plant are illustrated in Figures 6 and 7 respectively.

PRESENT INVESTIGATION

Sampling

On the first visit to the Red Cloud Mine, the writer took a total of four samples. The sample descriptions and the assay results are given in Table 2, the sample locations are shown in Figure 2, and the assay sheet is given in Appendix C.

Table 2. Sample Descriptions & Assay Results.

Sample No.	Sample Description	Assay Au oz/ton	Ag oz/ton
1	Random chip sample from an outcrop of the main vein, 8' wide, strike N - S, dip 60° E. (Figure 8).	tr.	-
2	Random grab sample from an old test pit, approx. 400' west from the sample no. 1 outcrop. The vein shown in the pit is approx. 4' wide, strikes N 60° E, dips 70° E.	.20	-
3	Random grab sample from an ore pile came out from the shaft.	1.02	.30
4	Random grab sample from the ground where a quartz vein outcrop was located, near a storage shack, approx. 200' SE from the old shaft. No outcrop was visible. (Figure 9).	tr.	-

In-Place Value Estimation

In the estimated ore calculation, the following observations are considered:

1. From the California Journal of Mines & Geology Report.

   a. The main vein was traced more than 4,500' long, and the average width of the vein was 5'.

   b. The old shaft was down to the 700' level with each 100' interval levels. The ore shoot, approx. 400' long at both sides of the shaft, were mined out above 500' level.

   c. Between 600' and 700' levels, the high grade zone or ore shoot was lost.

   d. In 1921, the gold production of $ 1,500,000 was reported and mostly native gold or coarse free gold were produced from the Red Cloud Mine. It can easily be assumed that the old timers mined out only the visible free gold ore, at least 2 or 3 ozs./ton, and the low grade ore, one oz./ton or less, was left in the mine.

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e. According to a statement of an old time miner, the low grade ore or waste was left underground as backpacking of the stopes.

2. From the Test Drilling.

a. The drill samples were the disseminated siliceous wall rocks with some sulfide minerals and the fire assay shows no gold where as the X-Ray analysis shows gold content. Evidently, it is very minute gold or chemical or compound gold which in most case loos in fire assay process.

b. The X-Ray ananlysis shows a consistant gold content, average + .50 oz./ton from the depth of 60' to 150'.

3. From the Writer's Sampling.

a. The sample no. 3 was from the low grade ore zone or outside of the ore shoot and assayed for 1.02 oz./ton Au and .30 oz./ton Ag.

b. The disseminated wall rocks, siliceous, observed at outcrops and the old test pits range a few feets to over 20' at both sides of the vein.

The estimated ore calculation is made in two parts; (a) Positive or proven Ore, and (b) Probable Ore as follows:

(a) Proven Ore.

The proven ore is calculated in three parts as shown in Figure 9.a:

i. The fresh or solid ore between 500' and 600' levels

Depth of Vein: 600' level - 500' level = 100'

The Length of Ore Shoot = 800'

Average Width of the Vein = 5'

Therefore, 100' X 800' X 5' = 400,000 ft^3

Assume Tonnage Factor - 10 ft^3/ton

Therefore, the ore block is 40,000 tons

It is the ore shoot, therefore assume 2 ozs./ton Au,

therefore, the in-place gold is 2 ozs./ton X 40,000 tons = 80,000 ozs. Au

ii. The low grade broken ore in the stopes

    Between 100' level and 500' level: 400' depth

    Length of the ore shoot : 800'

    Average width: 5'

    Assume the broken ore in the stopes equivalent 60% of the solid ore

    Therefore, the ore block is (400' X 800' X 5')60% = 960,000 ft^3

    Assume average 1 oz./ton Au   or = 96,000 tons

    Therefore, the in-place gold is 1 oz./ton X 96,000 tons = <u>96,000 ozs. Au</u>

iii. Disseminated wll rock ore

    Between 100' level and 600' level: 500' depth

    Assume average 10' wide

    Ore shoot length: 800'

    Therefore, the ore block is 500' X 800' X 10' = 4,000,000 ft^3

                           or = 400,000 tons

    Assume .50 oz./ton Au, therefore the in-place gold is <u>200,000 ozs. Au</u>

The Total In-place Ore is   40,000 tons at 2 ozs./ton Au, 80,000 ozs. Au

                             96,000 tons at 1 oz/ton   Au, 96,000 ozs. Au

                            400,000 tons at .50 oz/ton Au, 200,000 ozs. Au

            Total   <u>536,000 tons ore</u>   <u>376,000 ozs. gold</u>
                            Proven Ore   In-Place Gold

(b) Probable Ore.

The probable ore is calculated in two parts as shown in Figure 9.b:

i. Quartz vein ore

    Depth: Betwee 100' and 700' levels = 600'

    Length: Total 4,500' - 800' Ore Shoot. = 3,700'

    Average width: Assume 5'

    The ore block = 600' X 3,700' X 5' = 11,100,000ft^3

                         or = 1,110,000 tons

    Assume average .50 oz/ton Au; .50 oz/ton X 1,110,000 tons = <u>555,000 ozs. Au</u>

ii. Disseminated Wall Rock Ore

        Depth: 600'

        Length: 3,700'

        Assume average width 10'

        Therefore, the ore block is $600' \times 3,700' \times 10' = 22,200,000$ ft^3
                                         or $= 2,220,000$ tons

        Assume average .50 oz/ton Au - In-Place Gold is   1,110,000 ozs. Au

Therefore,   total probable ore is 1,110,000 tons   quartz vein ore
                                 2,220,000 tons   disseminated wall rock ore

              Total 3,330,000 tons Probable Ore

        Total In-Place gold is   550,000 ozs. Au in quart vein ore
                        1,110,000 ozs. Au in diss. wall rock ore

              Total   1,660,000 ozs. Au In-Place Probable Gold

Summary of Estimated In-Place Value.

i. Proven Ore:

        40,000 tons   @ 2 ozs./ton -   80,000 ozs. Au

        96,000 tons   @ 1 ozs./ton -   96,000 ozs. Au

        400,000 tons @ .50 oz/ton -   200,000 ozs. Au

  Total 536,000 tons Proven Ore   376,000 ozs. In-Place Gold

ii. Probable Ore

    Total 3,330,000 tons @ .50 oz/ton - 1,660,000 ozs. In-Place Gold

Therefore, Grand Total;

        536,000   tons proven ore   376,000 ozs. proven gold
        3,330,000 tons probable ore   1,660,000 ozs. probable gold

  Total 3,866,000 tons ore   2,036,000 ozs. In-Place Gold

iii. For Market Gold Price $ 450.00/oz.

    $ 450.00/oz X 2,036,000 ozs. = $ 916,200,000 Total In-Place Value

    $ 450.00/oz X 376,000 ozs. = $ 169,200,000 Proven Ore Value

    $ 450.00/oz X 1,66,000 ozs. = $ 747,000,000 Probable Ore Value

Note: The above in-place value is only for gold without including silver value.

Other Observations

In view of the mining operation, a few favorable conditions were observed as follows:

1. The quartz vein ore and the disseminated wall rock ore are suitable for either vat- or heap-leaching process, therefore the gold/silver recovery cost will be minimal.

2. The accessibility and transportation conditions are excellent year round.

3. Sufficient water source is available right at the mining property.

4. A few mine cabins and a fair size storage shack and telephone facility are already installed in the mining property. The commercial electric power is available at only a few miles from the mine.

RECOMMENDATIONS

The total estimated in-place value is $ 916,200,000; however, the in-place value of only the proven ore is $ 169,200,000. Nevertheless, in consideration of only one per cent (1%) of the proven ore in-place value is $ 1,692,000 which is more than well justified to invest for the Red Cloud Mine. With this amount of investment, the Red Cloud Mine can be developed into an atractive and economical gold/silver producer.

REFERENCE

1. U. S. Geological Survey Topographic Map, Buckhorn Peak Quadrangle - 7.5 minute. U. S. G. S., Denver Colorado 80225, 1929.

2. Jenkins, O. P. Geologic Map of California - San Jose sheet, Division of Mines & Geology, State of California, 1966.

3. Bowen. Mines & Mineral Deposits, Mariposa County. California Journal of Mines & Mineralogy, v 53, pp. 163 - 164, 1957.
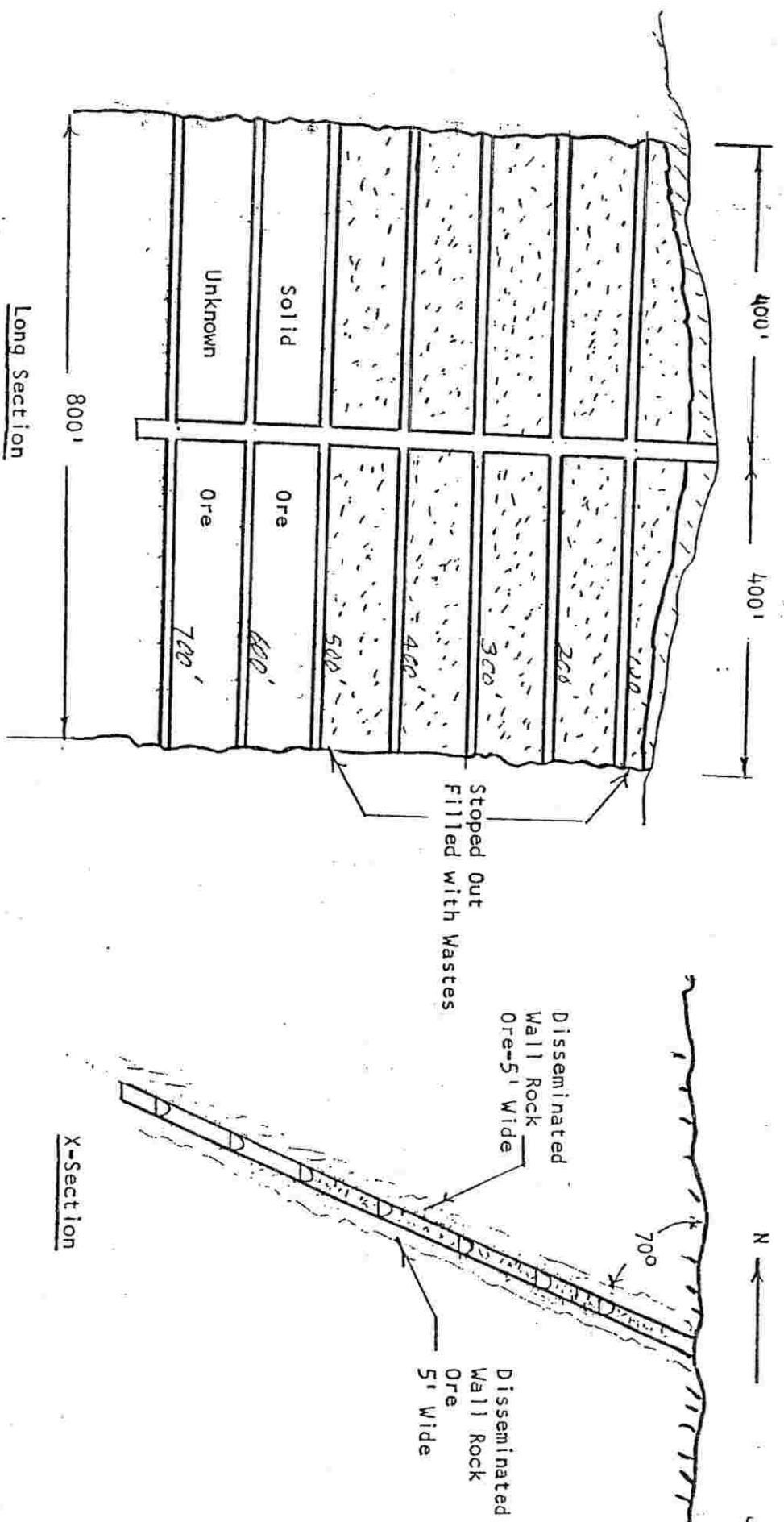
Figure 10. Proven Ore.
Idealized Sketch

Long Section

Unknown | Solid | | | | | |

Ore | Ore | | | | | |

800'

400' | 400'

700' | 600' | 500' | 400' | 300' | 200' | 100'

Stoped Out
Filled with Wastes

X-Section

Disseminated
Wall Rock
Ore–5' Wide

Disseminated
Wall Rock
Ore
5' Wide

70°

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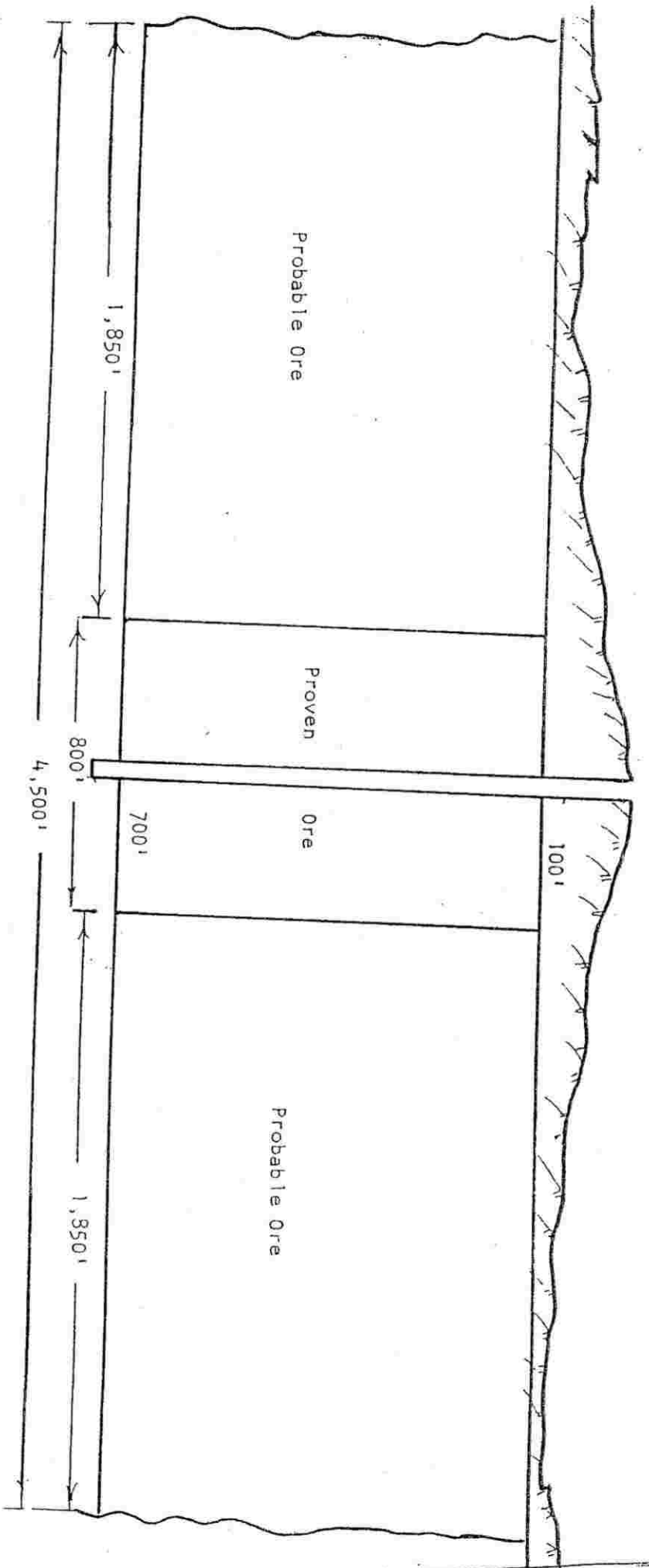
Long Section View

(X-Section same as Figure 10)

Figure 11. Probable Ore,
Idealized Sketch

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Figure 1. Location Map

Figure 2. Claim Map.
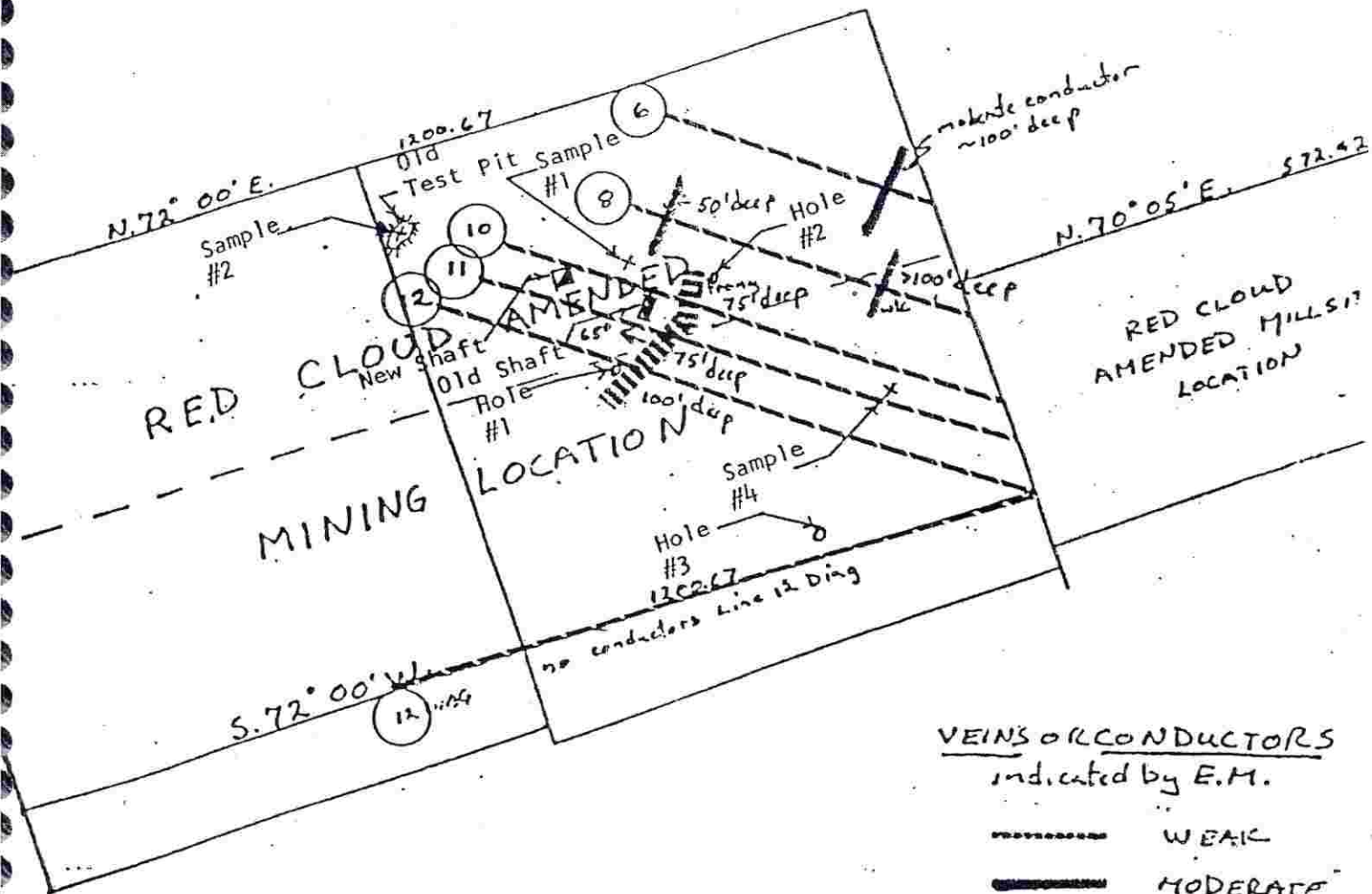
VEINS OR CONDUCTORS
indicated by E.M.

- - - - - - WEAK
━━━━━━ MODERATE
||||||||||||| STRONG

Appʳᵃⁿ Dip shown by arrow
65° ←

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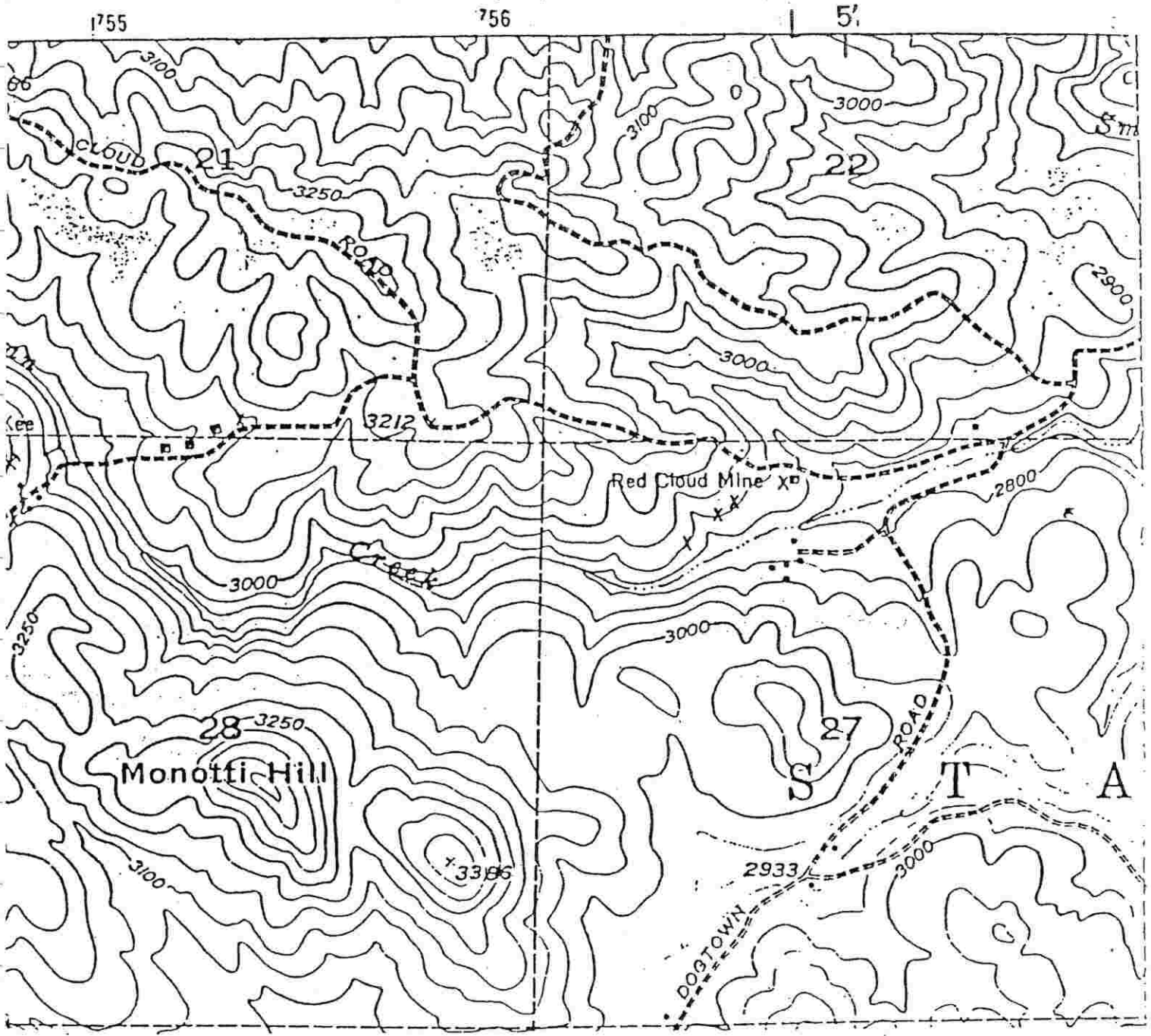
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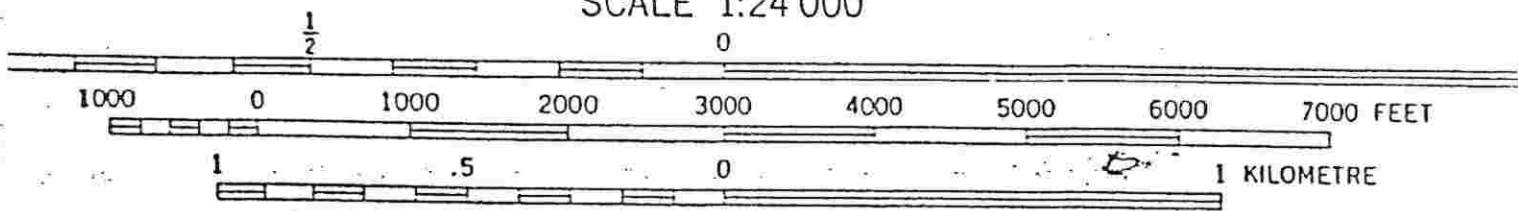
CONTOUR INTERVAL 50 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ckhorn Peak Quadrangle - 7.5 minute

Figure 3. Topography Map.

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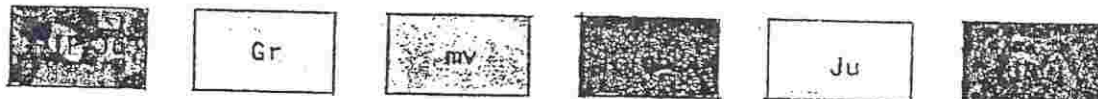
Figure 4. Geological Map.   Scale 1:250,000

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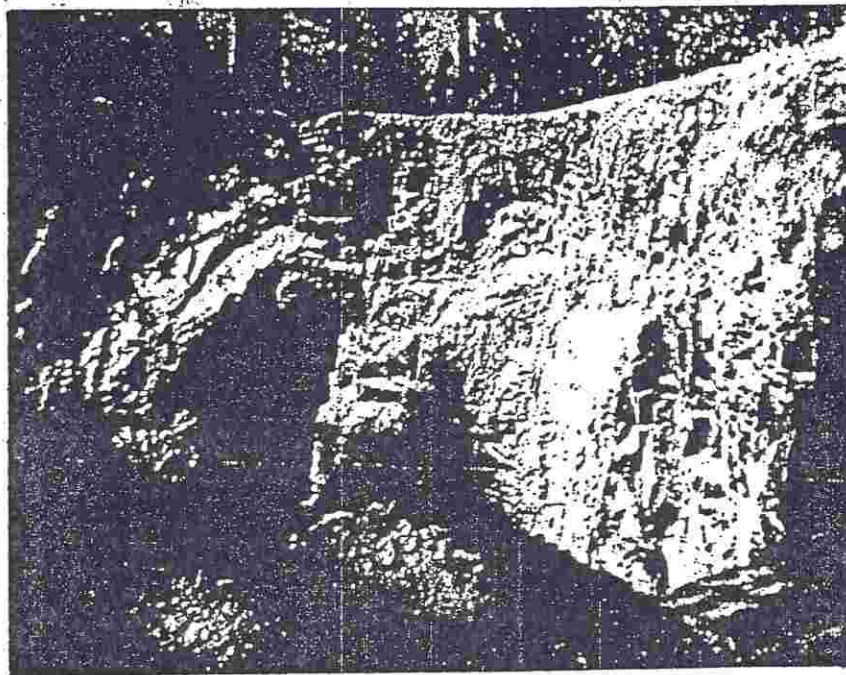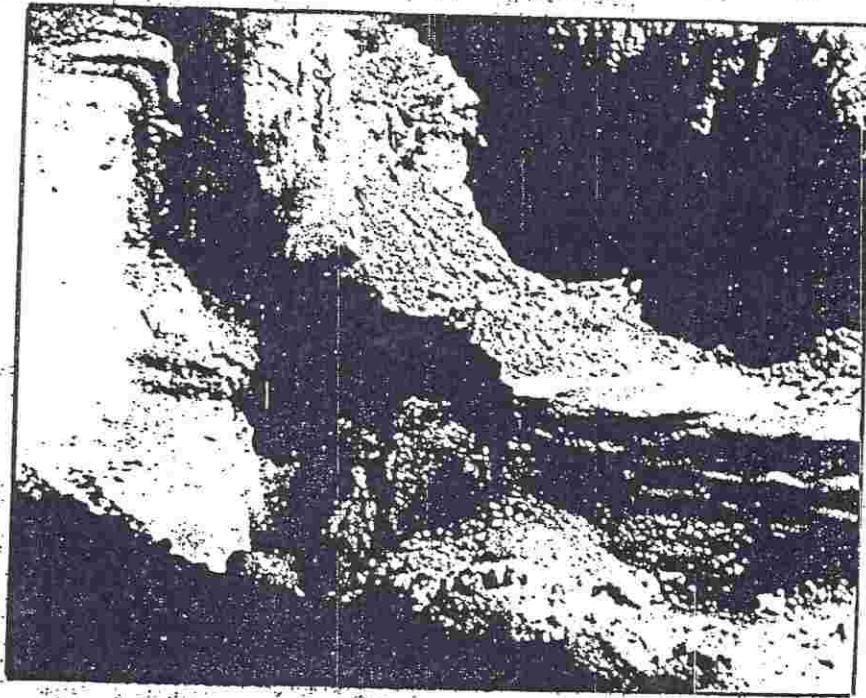
Figure 5. Disseminated Wall Rocks at the Old Test Pit.
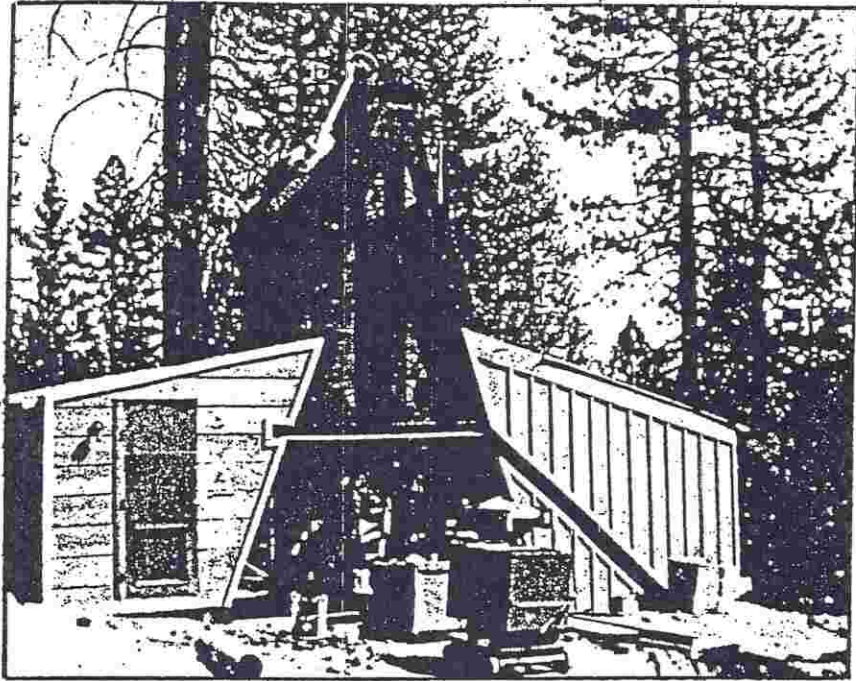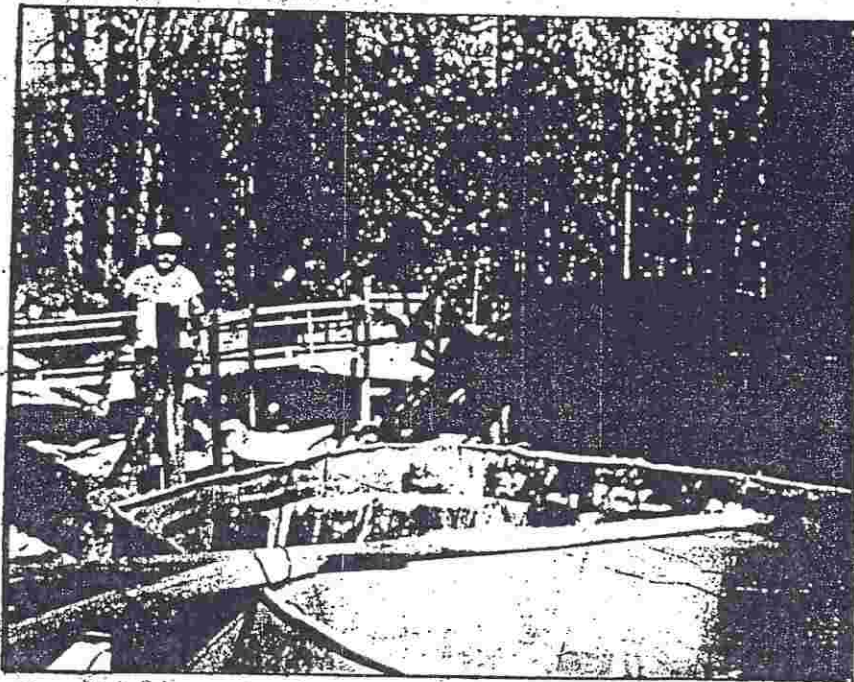
(a)
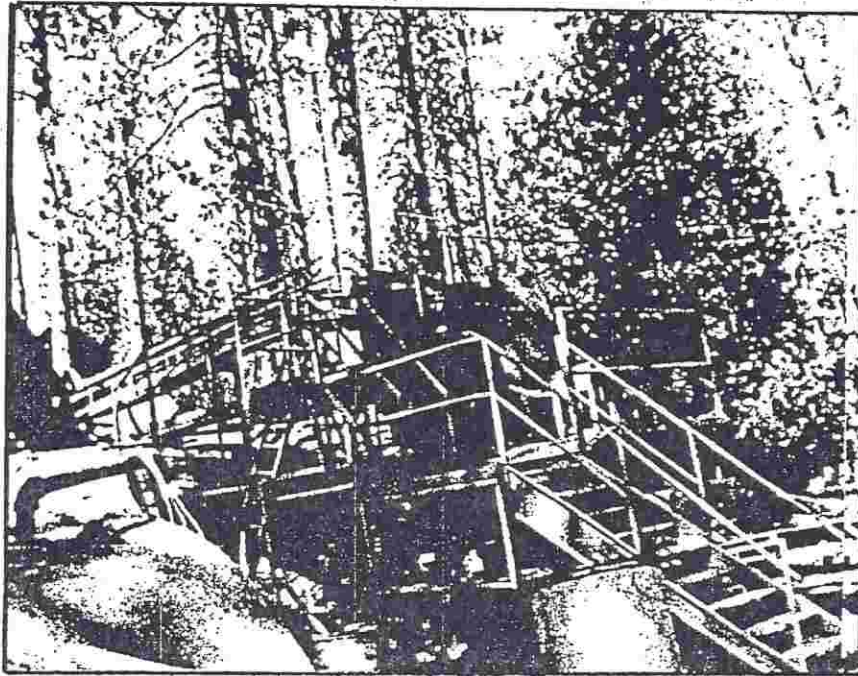
(b)

Figure 6. New Shaft.
    (a) The Head Frame & Ore Car
    (b) The Jaw Crusher
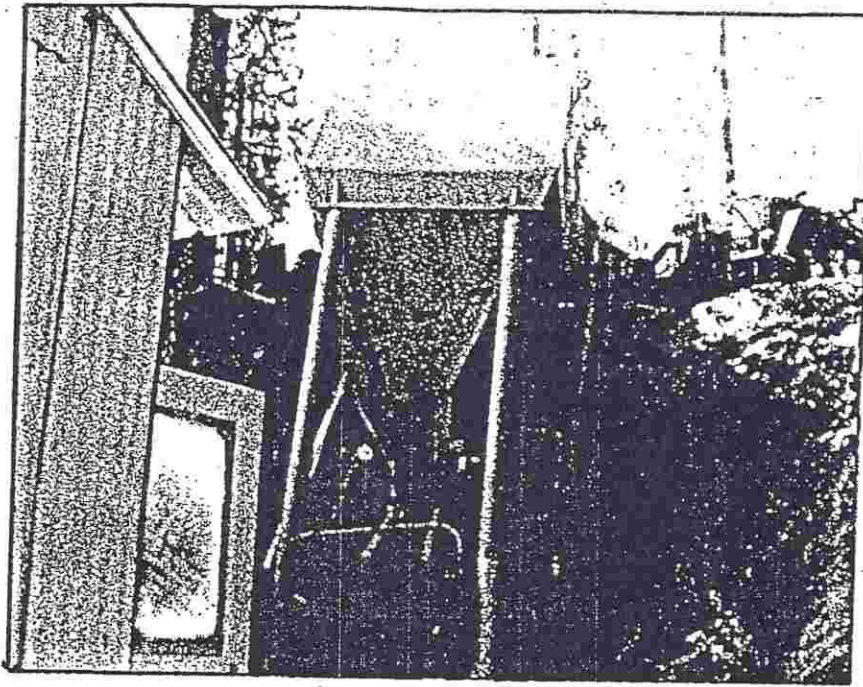
(a)

(b)

Figure 7. The Pilot Plant.
   (a) Ore Bin to the Plant
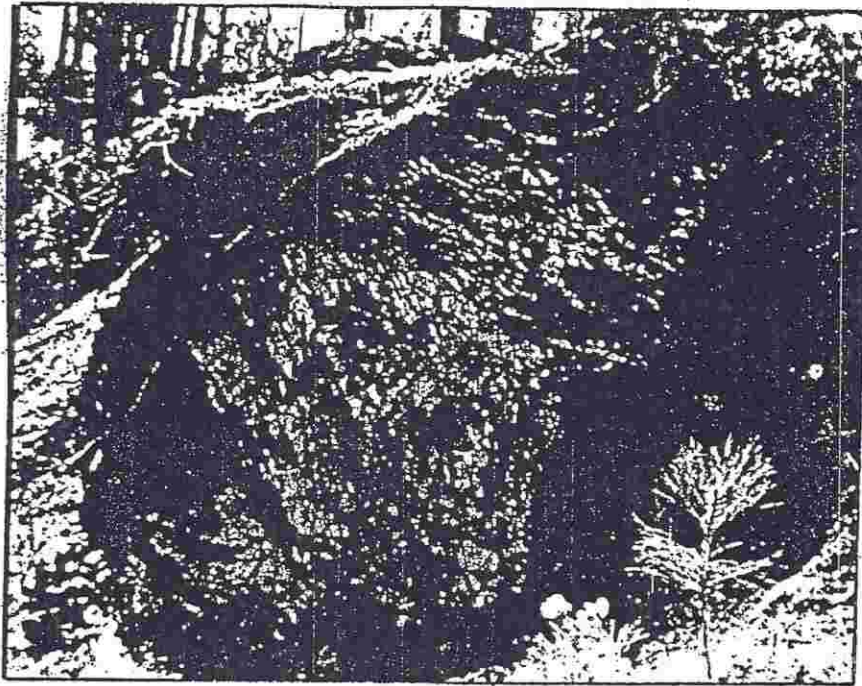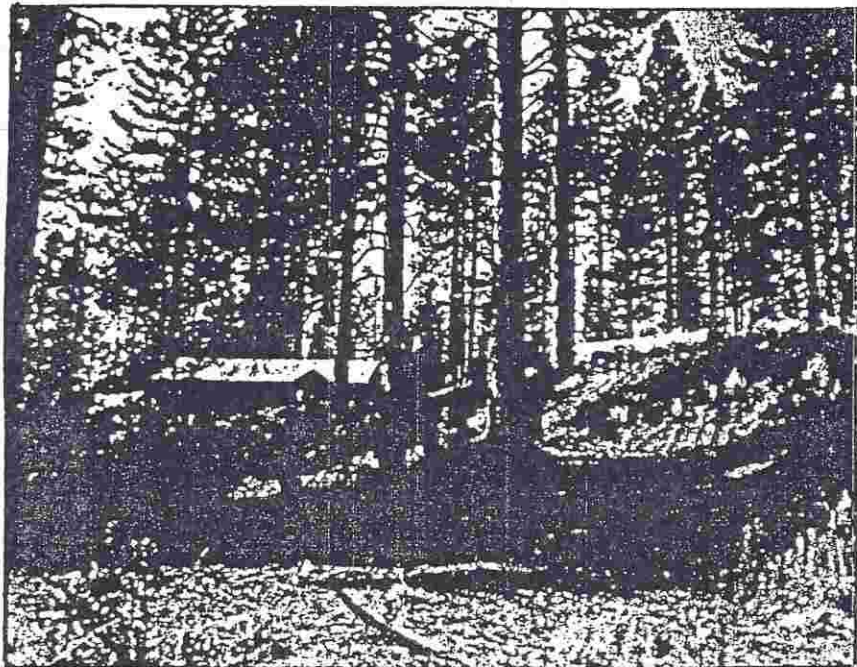   (b) The Mill

Figure 8. The Outcrop of Sample No. 1.

Figure 9. The Location of Sample No. 4
by the Storage Shack.