PERCUSSION DRILLING PROJECT
ROSEDALE MINING DISTRICT
Socorro Co., N.M.

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PERCUSSION DRILLING PROJECT, ROSEDALE MINING DISTRICT, SOCORRO COUNTY, NEW MEXICO

SUMMARY

A drilling program designed to test indicated gold-silver mineralization occurring in two veins in the Rosedale Mining District was initiated on April 24, and terminated May 10, 1976. Eight percussion holes were drilled - total 1472 feet. This drilling has indicated a weakening vein structure at the north end of the Rosedale vein. Results of drilling at the north end of the Bell vein are inconclusive. Five holes, totalling 570 feet, were drilled at the south end of the Bell vein. Three of these holes tested vein material characteristic of the ores extracted from the Rosedale mine. Difficulties in obtaining good samples were often encountered due to hole caving. Assays of drill cuttings received to date indicate minor to trace amounts of gold. No ore was revealed by the drilling, but the presence of a strong mineralized vein structure has been established at the south end of the Bell vein.

LOCATION

The Rosedale Mining District is located in Secs. 6 and 7, T6S, R5W, and Secs. 1 and 12, T6S, R6W, N.M.P.M.; in Rosedale Canyon of the San Mateo Mountains. The District is situated about 25 road miles SSW of Magdalena, N.M. (See Fig.1).

BACKGROUND

Gold was mined from the Rosedale vein during several periods between 1886 and 1937. Incomplete data indicate that approximately 70,000 tons ore grading 0.30 - 0.35 oz/ton Au, with some silver, was produced. The mine was worked continuously from 1886-1911 and from 1913 until fire destroyed the surface structures and shaft timbers in 1916. Rosedale Gold Mines, Ltd. of Vancouver, Canada, obtained the property in 1935. This company produced approximately 50,000 tons of ore of undetermined grade until the mine closed in 1937.

PKK first examined the Rosedale area in May, 1975, as part of a state wide exploration program we are conducting, on a consulting basis, for The Superior Oil Company and General Crude Oil Company. Geochemical sampling and geologic mapping indicated the presence of areas along the veins that could contain $\pm 1\frac{1}{2}$-2 million tons of gold-silver ore. Property acquisition followed the initial studies and the ground now held consists of the 50 unpatented claims (ROS group) of Superior-General Crude, and two patented claim groups under lease or option. The reader is referred to PKK reports dated June 13, 1975, September 16, 1975, December 29, 1975 and February 3, 1976, for more detailed background information.

PROPERTY

PKK staked and validated 50 lode mining claims in the District during September, 1975. Agreements were concluded with the owners of two critical patented parcels. An additional agreement with the owner of patented land around Oak Springs provided access to the SW side of our unpatented claims block (S. end Bell vein). The properties and payment schedules under the various agreements are summarized below. The reader is referred to our attorney's letter opinion dated March 12, 1976 (Lacy to Perry), and to Figure 10 for a better understanding of the property situation.

SUMMARY OF AGREEMENTS

Area: Rosedale Mine (Harry R. Ralston)
Property: Two patented lode claims, one patented millsite - total 44.03 A.
Option Agreement: dated February 7, 1976 - TPP $175,000.
Payment Schedule: $2000 initial payment, $3000 due Aug. 7, 1976 -- escalates to $10,000/yr. in 3 yrs. -- or 5% NSR all toward TPP.

Area: Bell Mine (Chas. F. Headen)
Property: Three patented lode claims - total 52.42 A.
Lease Agreement: dated February 13, 1976
Payment Schedule: Initial payment $1500, $2000 due Aug. 13, 1976 -- escalates to $10,000/yr. in 10 yrs. or 3.5% NSR no end payment.

Area: Oak Springs (Tigner Cattle Co.)
Property: Patented ranchlands
Agreement: Trespass rights, road building rights and right of first refusal to purchase portion of patented lands in area of interest - for 10 years.
Payment Schedule: $750 outright - paid 5/19/76, $150/yr. for 10 years (subject to cancellation by PKK or assigns).

OBLIGATIONS ON US FOREST LANDS

We are obligated under the existing USFS regulations to reasonably rehabilitate and revegetate with grasses any roads or other surface disturbance created on Forest land. The regulations also require that we submit, in advance of any work, an operating plan describing the proposed work and detailing our methods of restoration. The Forest Service was unable to expeditiously process our original operating plan. Work performed to date was under a special use permit.

GENERAL GEOLOGY

The Rosedale and Bell structures are strong epithermal veins occurring in rhyolitic ash flow tuffs, along the southeast side of the Mt. Withington cauldron. The veins are separated by about one mile. Each vein occupies a N10-15W fault zone of through-going nature.

The Rosedale vein is traceable for a distance of about 7500 feet (Figure 2). At the Rosedale Mine the vein forms a prominent outcrop that is characteristically a zone of shattered, brecciated and sheared rhyolite tuff laced by porcellaneous quartz veins and chalcedony stringers up to six inches thick that form a zone as much as 50 feet wide. Weaker quartz veining and silicification may occur locally out from the indistinct vein footwall for an additional 75 feet. Rock of this nature forms a body approximately 1200 feet long in the vicinity of the Rosedale shaft. The southern extension of the Rosedale vein is exposed only locally. It is generally marked by zones of shattered, silicified and pyritized rhyolite or by shear zones with scattered fluorite and MnOx.

The Bell vein outcrops boldly only near the Bell adit (Figure 2) where it forms a bluff of sheared, silicified rhyolite and vein quartz. The vein generally follows a post-mineral fault and is largely covered by colluvium along its southern trace. Where uncovered by our drill road construction at its southern end, the Bell vein consists of a zone of strong porcellaneous quartz, with locally heavy MnOx staining. It is approximately 15 feet wide, bordered on the east by a zone of silicified rhyolite with interlacing quartz stringers. This zone gradually grades into less well silicified wallrock. A wide zone of intramineral breccia occurs adjacent to the southern end of the Bell vein (Figure 2). This breccia is characterized by slightly silicified kaolinitic rhyolite fragments containing minor amounts of disseminated pyrite in a matrix of extremely iron-stained rock flour and microbreccia. Fairly large areas of fractured and silicified rhyolite are associated with these breccias in the Oak Spring area.

Alteration of the rhyolitic country rock consists of bleaching which increases in intensity and is accompanied by variable amounts of oxidized pyrite as the veins are approached. No intrusive rocks are known in or near the District.

NATURE OF GOLD MINERALIZATION

In those portions of the Rosedale Mine where ore was extracted, the gold occurred generally in an ill-defined quartz vein comprised of massive to anastomozing waxy-lustered horn quartz and rhyolite-quartz breccia. Gold was reportedly found to occur both in the greenish horn quartz and the breccia, but not always in both, when both were present (Metzger, 1938). The bulk of the gold was spotty and occurred in high-grade streaks on either side of the vein. At the Rosedale, ore-grade material was stoped from about 75-100 feet below the surface to a depth of 725 feet. The better-grade gold appears to have occurred in a more-or-less shoots characterized by the presence of greenish and reddish horn quartz, some disseminated pyrite (oxidized), manganese oxides and, occasionally, fluorite and silicified relicts of barite and calcite. The ore formed two shoots arranged along strike, with a narrow zone of low-grade material intervening. The shoots coalesced at depth to form a single body approximately 200 feet long that extended below the 725 foot level, the lowest workings in the mine.

In detail, the gold is seen to occur as minute flecks and films generally associated with a distinctive reddish hematite-limonite along fractures, in small vugs, in banding in the horn quartz, and in two cases, as tiny grains in a cube of limonite after pyrite(?). No gold coarser than 0.1-0.2mm has been observed. Little is known of the mode of occurrence of silver at Rosedale, but it is always present -- in our sampling in amounts generally exceeding that of gold.

Metzger, O. H.; Gold Mining in New Mexico, USBM IC-6987 (1938)

OBJECTIVE OF DRILLING PROGRAM

The objective of the drilling program in the Rosedale District was to test areas along the Rosedale and Bell veins where previous geochemical sampling had indicated the possible presence of mineralization similar to that developed in the Rosedale Mine (i.e. 0.30-0.35 oz/ton Au with some silver). Drill holes were laid out to test possible extensions of mineralized shoots in the old Rosedale workings, to probe the possible mineralization beneath the Bell adit and to explore the areas of favorable-looking vein quartz south of the Bell workings. Geochemical surveys had established that rocks over each of these areas contained gold and silver in amounts similar to those found over the old Rosedale workings (±0.1-1.0+ppm Au, +1.0ppm Ag).

LIMITS OF EXPLORATION

The program was limited to a test of three of the five areas of interest because of a possible property conflict covering an area south of the Rosedale Mine. One of the zones of interest not tested is an area of silicified, pyritized rhyolite located at the junction to two structures. The other is a wide shear zone containing considerable fluorite, manganese and vein quartz.

Figure 2 shows the anomalous areas and drill hole locations.

DRILLING AND SAMPLING PROCEDURE

At each drill site a relatively flat pad was constructed. The contractor, Hank Avery Drilling Co., of Midland, Texas, provided a track-mounted diesel hydraulic percussion drill equipped with a five-inch, down-the-hole hammer and a truck-mounted compressor. The drill boom can be rotated about two axes to achieve the desired hole attitude from almost any set-up. The contractor supplied a driller and two helpers. PKK provided a supervisor, a geologist to log the samples and two men to handle on site sample splitting. At least two persons were required to work the samples because of the extreme rapidity at which the drill occasionally advanced (+2 ft/min.).

An 8 inch diameter hole was drilled approximately 6½ feet deep to accomodate a 6½ inch collar pipe and tee. The hole was blown as clean as possible. A 4" diameter flexible hose was attached to the tee to transport air-blown cuttings to a cyclone from which samples were collected in 5-gallon metal buckets. The samples were reduced in size through Jones splitters and a sample weighing about 10 pounds was saved for analysis. Figure 3 illustrates the sample splitting procedure.

In some cases oversized samples were collected, such as where there was caving from the upper part of the hole or collapse of the hole around the bit. The oversized samples were split and bagged separately and the anomalous amounts noted by the logging geologist.

LOGGING PROCEDURE

A small handful of the drill cuttings was collected from each sample interval. These cuttings were examined in a small glass dish, on site, by PKK geologist, N.I. Colburn, using a 10 power hand lens. The purpose of this logging was to provide information concerning rock type, alteration, quartz mineralization typical of the exposed veins and metallic and oxide mineralization. The summary of this data was used to determine which intervals should be assayed. The accuracy of this type of logging is necessarily limited by such factors as: the limited time available to inspect each sample, size of the sample, experience of the logging geologist and our inexact knowledge of the geometry and appearance of the vein at depth. Ms. Colburn's field logs are attached as appendices to this report. They contain some data not critical to drill hole evaluation.

Cuttings from the vein zones were seen to contain substantial amounts of waxy-lustered horn quartz, vari-colored porcellaneous quartz and chalcedony stained with Mn and Fe oxide. Samples from the central parts of the veins contain as much as 75% vein quartz and silicified microbreccia broken into fragments less than one centimeter in maximum dimension. Cuttings from the walls of the central vein generally are a mixture of rhyolitic rock fragments less than 0.5 cm in any one dimension, containing less than 15-20% varicolored porcellaneous quartz or chalcedony. The quartz veinlets can sometimes be seen to cut the larger rock fragments; but quartz was generally present in discrete chips. Iron oxides were present in all mineralized areas as coatings and in cube-shaped psuedomorphs after pyrite.

The maximum fragment size decreased rapidly with depth or intensity of silicification; often consisting primarily of rock powder and fragments less than 5-10mm in diameter. Fragment size generally greatly diminished from depths greater than 100 feet.

DESCRIPTION OF DRILLING PROGRAM

Road Building: The construction of access roads and drill pads commenced on April 13, 1976, using an all-hydraulic TD-25B dozer with ripper. Due to the extremely rugged terrain and lack of soil cover at the south end of the Bell vein, a two-man blasting crew was required to supplement the bulldozer. All road work was completed on May 5, 1976, after a delay of several days due to dozer breakdown.

Drilling: Drilling commenced on April 24, at a location at the north end of the Rosedale vein (see Fig. 2, 4 and 5). The hole (RP#1) was oriented so as to intersect the vein at a depth greater than 400 feet. The eastern edge of the vein, which is a complex zone of anastomotic porcellaneous quartz veins and rhyolite fragments at the surface, was encountered at a drill depth of approximately 350 feet and extended irregularly to about 494 feet, giving a total true width to the zone of approximately 50 feet. Some caving occurred from the top of the hole especially around the 445 foot interval.

The drill was then moved to a position on the northern end of the Bell vein (see Figures 2 and 6). It was directed to intersect the vein about 300' down dip. The hole was oriented S35W at -35°. This hole (RP-2A) caved badly from the outset and was abandoned after drilling 28 feet. A second set-up was made approximately 10 feet southeast of 2A. This hole (RP-2) oriented at S41W -35°. RP-2 was drilled with only minor difficulty to a depth of 92 feet. A small sample was returned for the intervals 94-96, 98-100 and a very large one from 100-102. The drilling was stopped and the hole cleaned thoroughly using a slight water mist. A piece of aluminum casing approximately 6 feet long was added to the collar pipe and drilling resumed. There was possibly some caving from around the collar, from 104-116 and the drilling was stopped.

In view of the fact that this area of the Bell vein appeared to have some considerable potential as an ore zone, a third attempt (RP-3) was made to penetrate the zone (Figure 6). The drill was moved approximately 11 feet to the SE and collared in bedrock. The hole was oriented at S41W, -35°, parallel to RP-2. Little trouble was encountered to a drill depth of 206 feet, at which point a larger than normal sized sample was obtained, and after which several of the samples were smaller than normal. The cuttings at this time were very fine and it was felt that the dust was not clearing the hole properly. A small amount of water was injected to aid in cleaning and some better return was achieved. Caving again occurred at a depth of about 275 feet, about 75 feet short of the anticipated vein zone. Because so much time and money had been expended on the three efforts at the site and because orienting the hole at a significantly steeper

angle (greater than 45°) would have caused the vein to be intersected at the practical limits of the drill (±500 feet), it was decided to abandon the site.

The drill was moved to a site approximately 550 feet south of the old Rosedale shaft and several attempts were made to explore the southward continuation of the Rosedale orebody. All attempts to collar holes at this site failed. It was finally realized that the drill and crew were severely limited when any unusual drilling conditions were encountered. They were unable to cope with any thickness of alluvium, were not trained to drive casing and did not have the capability to deal with adverse hole conditions.

We felt that, knowing the limitation of the contractor, we could probably still get some valid test of the vein at the south end of the Bell vein system if we collared in bedrock and inclined -60° or greater from the horizontal.

The drill was moved to a position north of Oak Spring (Figures 1, 2 and 8). RP-4 was a test of a heavily iron-stained and brecciated rhyolite. The hole was oriented N71W at -55° to test the character of the breccia at depth. Minor porcellaneous quartz and abundant iron oxide were found in the cuttings. Some pyrite was seen at 126-128, although the majority of the rock is extremely oxidized. The hole was successfully completed at a depth of 148 feet. Assays indicate that only trace amounts of gold and silver were encountered between 86 and 110 feet. The remainder of the rock penetrated was barren.

Hole RP-5 was positioned about 1500 feet NNW of RP-4 (see Figure 7). It was oriented N34E at -70° to cut the southern Bell vein, a wide, heavily silicified structure with abundant horn quartz, at a depth of approximately 165 feet. The hole was collared in several feet of moderately compacted gully fill and was drilled to a depth of 86 feet, after which some contamination from surface material was noted. Good vein material was noted at 96 feet. The hole was abandoned at 114' because of extreme caving around the collar. Assays of somewhat contaminated vein material indicate minor amounts of gold and silver from 98-102 feet and traces of gold and silver on either side of that interval.

Hole RP-6 was positioned approximately 180' SE of RP-5 (Fig. 7 and 9). It was oriented E at -70° to test the Bell vein approximately 100 feet down-dip. Good vein material was encountered at depths of 72-82 and 98-120 with lesser amounts on either side of these intervals. Heavy caving from a faulted zone on the hanging wall of the vein at 72 feet resulted in some unusually large samples in the interval 72-78. Drilling was stopped at 76 feet to clear the hole and some

water injected in an attempt to pack the walls. Drilling was resumed the following day and little additional caving was apparent. The hole was terminated at a depth of 154 feet after passing thru a split vein of approximately 25-30 feet true thickness and perhaps 10-15 feet of less favorably mineralized footwall. Assay results indicate minor amounts of gold and silver were present in the sample 74-78 and trace amounts of the metals were found in the other areas of good quartz mineralization.

Hole RP-7 was collared to the NW of RP-6, and approximately 95 feet SE of RP-5, in another attempt to test the vein to the north (see Fig. 9). The hole was oriented N86E at -75°. It was collared just west of the hanging wall of the vein and was drilled to a depth of 58 feet (see Fig. 7 and 9). Vein was encountered from a depth of 22-58 feet, but very severe caving in that same interval resulted in some very large samples. The hole was abandoned because of severe caving of the vein walls. Assays of these samples indicate that minor amounts (average 0.051 oz/ton Au) of gold and silver were present over the interval 28-50 (see attached assays) a true thickness of approximately 10 feet. Trace amounts are present on either side.

Hole RP-8 was collared in the hanging wall boundary of the Bell vein and oriented N86E at -75°, from a location approximately 50 feet SE of RP-7 (see Fig. 1 and 9). Abundant vein material was encountered from the surface to a depth of about 50 feet. Visible gold was observed in hand sample at a depth of 24'. The hole was terminated at a depth of 98 after passing from vein-type material into bleached rhyolite containing limonite after pyrite at a depth of 78 feet. The drilling project was terminated the afternoon of May 10, 1976, after drilling 8 holes totalling 1472 feet.

ANALYSIS OF THE DRILLING PROGRAM

Although a first review of the assays of the vein intervals would indicate that the results of this drilling project were negative, it is my opinion that the results should be considered inconclusive for the following several reasons:
1) Several of the drill holes collared did not reach their objectives. Only holes RP-1, 6, 7, and 8 tested the vein zone to any extent.
2) Holes RP-2, 3 and possibly 5 were unsatisfactory tests of the veins because of problems involving caving. The contractor did not live up to expectations and was unable to handle hole stabilization problems. The very nature of the percussion drill - a down-hole hammer with extreme vibration characteristics - only added to the problem.
3) Some of the samples from critical vein zones may have been diluted to some degree because of caving.
4) A comparison of the assays from the drill cuttings (results attached) and those gold and silver values obtained in geochemical sampling in vein zones at surface reveals that essentially the same values were obtained by both methods (0.1-3.0 ppm Au and 1-30 ppm Ag).

Larger chip (channel) samples taken across the faulted vein at surface at the southern end of the Bell indicated gold values of the order 0.1-0.2 oz/ton (see report dated Feb. 3, 1976). Assays from drill samples in this area (RP 5-8) generally indicated gold values of 1 ppm or less. The highest grade interval measured in drilling was encountered in RP-7 where the zone 26-50 averaged 1.8 ppm (0.051 oz/ton)Au. The highest values obtained from a single interval were those from 30-32 (3.7 ppm (0.107 oz)). These facts indicate at least two possibilities:

a) There is not a substantial amount of gold in those parts of the Bell vein tested by this drilling program.

b) Most any substantial amounts of gold present was lost from the sample obtained.

Both possibilities may have contributed to the low analyses because of the nature of the gold occurrence in these veins. The fact that the gold in the oxidized portions of the veins in the Rosedale District occurs as tiny grains generally in limonite along fracture surfacesin horn quartz is a factor that may not lend itself to evaluation by percussion drilling. The hammer drill breaks the rock into small fragments which are then transported by forced air to the top of the hole and thence to the cyclone for sample collection. In general, the rock will tend to break along pre-existing fractures or planes of weakness. The broken fragments are then generally abraded against themselves, the drill pipe, hole wall and collar tee in their trip to the sample bucket. Any gold present on the outer surfaces of the rock chips could easily be dislodged

during this abrasion and the natural winnowing effect of the moving air column might result in its removal from the sample. I believe that this phenomenon may have occurred during the Rosedale drilling and might explain at least in part, the very low tenor of many of the vein samples.

5) The gold in the Rosedale vein has been described (Metzger, 1938) as occurring as small free particles in narrow zones that would in some places favor the hanging wall of the vein and in others would be found along the "footwall" side. This is typical of gold veins of this type and, therefore, it is apparent that the bulk of the gold at any one place would occur over perhaps two or three feet of a zone of horn quartz ten or more feet in width. While the bulk of the quartz might contain small amounts of gold, the mining was supported by the higher gold content in the thinner zone. Obviously, the gold does not occur in a true disseminated fashion that would be suitable for evaluation by one or two drill holes in the most favorable areas.

We can now say, ideally, the first round of exploratory drilling of this type deposit should involve several drill holes (preferably DDH) in each suspected ore shoot to test the vein at different positions along strike and at various levels down-dip.

One would be very fortunate to intersect high grade gold mineralization in one or two shallow holes drilled on each suspected ore shoot.

CONCLUSIONS AND RECOMMENDATIONS

For the several reasons discussed at length in this report, I believe that our recent drilling program at Rosedale has yielded largely inconclusive results. We have indicated that there is no strong vein zone typical of the ore mined in the past, existing at the 450 foot level at the northern end of the Rosedale vein. We were not able to test the vein in north end of the Bell structure because of drilling difficulties, but analyses of samples obtained indicate that the rock bordering the zone of interest contains trace amounts of gold (many time background). This may be evidence that the central zone contains significant gold. The test of the zone at the south end of the Bell indicates that a strong vein exists there, with all of the characteristics of the ore shoots mined in the Rosedale. Samples gathered from this zone during the drilling were low in grade, possibly because of dilution or other reasons outlined above.

Our test of the iron stained breccia zone adjacent to the Bell vein (RP-4) indicates that this rock contains no gold or silver in the interval drilled and deeper or more extensive tests are not warranted at this time.

The percussion drill is apparently an inadequate tool for this type of program and may have been a significant factor in the inconclusive results obtained.

A compilation of all assay and geologic data now indicates that the potential remains to develop approximately 1.5 million tons or ore grading 0.25-0.35 oz/ton Au from at least four possible ore shoots in the District (see Figure 2). These shoots would probably have a maximum width between 10 and 15 feet, be of variable length and would extend below the water table, which appears to be about 750 feet below the surface in this area. Additional potential exists for ore below the water table and there is a good possibility that some silver enrichment may have occurred at that level, as the upper part of the veins are thoroughly leached.

Should a target of the size described above continue to be of interest to Superior and General Crude, I would recommend that the area at the south end of the Bell be further tested utilizing a skid mounted diamond drill. Set-ups should be planned at at least two locations along the strike of the zone and fanned to test the vein at various levels. To drill two holes at each location to test the vein at levels 150 feet and 300 feet below the surface would require a minimum of 1200 feet of drilling at a direct drilling cost of approximately $18,000. This program should provide an adequate test of the vein at this location.