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item 6

Underground Geology

and

Exploration Potential

BETTY O'NEAL SILVER MINE

Lewis Mining District, Lander County, Nevada

by

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December 15, 1969

See map

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SUMMARY

Mapping at the Betty O'Neal mine during the summer of 1969 was done for the purpose of outlining exploration targets within the mine area.

Vein mineralization in the Betty O'Neal mine occurs along three sets of structures, a northeast striking system represented by the Estella, Kinkaid, and Nebraska veins; a northeast striking vertical structure represented by the Yankee vein; and a northwest striking structure containing the Betty Vein system.

Not enough information is available on the Betty structure to make recommendations concerning it.

The Estella and Kinkaid veins appear to be splits of the same vein, as they unite in the southern end of the mine.

The vertical Yankee vein is roughly parallel to the Estella-Kinkaid and intersects it along strike. As this intersection coincides with the large Estella ore shoots, it may be the one important ore control in the mine. All exploration recommendations in this report are based on this premise.

Except in an indirect way, as a control of structure, rock type is not felt to have been important in the process of vein formation at the Betty O'Neal.

As a result of the 1969 mapping, the following exploration areas have

been outlined on the Betty O'Neal property:

A. Northern Yankee-Nebraska Vein Area:

1. Drift northeast along the Yankee vein for 400 feet.

2. Drill two angle holes at -45° southeast to check for mineralization at the Yankee-Kinkaid intersection.

3. From the end of the new drift;

   a. Cross-cut northwest to check for the presence of the Estella vein.

   or

   b. Raise 150 feet to check for a possible Estella-Yankee intersection.

If the Yankee vein is offset by faulting, the plan would change to:

1. Drill a hole 8700 north, 12,700 east, 300 feet deep to check for a possible intersection in the offset Yankee-Nebraska vein.

B. Central Mine Area:

1. Drift southwest along the Yankee vein from Number 5 tunnel to the Number 4.

2. Drill a vertical hole from the Number 5 tunnel at a point northwest of the Yankee vein to check for a vein intersection below the level.

C. Southern Yankee-Kinkaid Area:

1. Drill a vertical hole, 600 feet deep at 6770 north, 11,470 east to explore the Yankee-Kinkaid intersection.
2. Drill a vertical hole at 6700 north, 10,900 east, 800 feet deep to explore for a continuation of the Kinkaid beyond and below its intersection with the Yankee.
3. Extend the cross-cut at 8280 north, 11,675 east on the 150 level for 120 feet southeast to cut the projected Yankee vein.
4. Drift southwest on the Yankee structure.
5. Drill holes at -45° southeast to intersect the projected Kinkaid vein.

It is felt that these recommended areas contain good potential for the discovery of additional ore at the Betty O'Neal.

INTRODUCTION

Detailed underground mapping of the Betty O'Neal mine was done during August and September of 1969. The purpose of the mapping project was to carefully record the geology of the accessible mine workings, noting correlations between rock type, structure, and mineralization. As a result, it was hoped that additional exploration targets could be outlined within the mine.

E. F. Lawrence mapped the mine in 1965, omitting rock types and the correlation of the important vein structures exposed in the workings. A. L. Payne prepared a detailed surface geologic map in 1967. Payne's report includes the history of the mine as well as the regional and detailed mine geology. As a result of Payne's findings, specific exploration recommendations were presented and have yet to be pursued.

The following recommendations were formulated during the summer of 1969. Details of rock type and structure of the mine will be mentioned only as they pertain to a specific area of interest outlined by the recent work.

CONDITION OF THE MINE

The mine was mapped in 1965, by E.F.L. and in the interim, a portion of the 150 level and levels below the 150 have caved and are no longer accessible. The condition of tunnels 1 through 5 is such that only a minimum of

of clean-up work would be required to make them useable. The Number 3 level and the S and SL sublevels are accessible only through the S-227 raise from Number 4 tunnel. The portion of the Number 5 tunnel where the Estella stopes cross it is in bad condition. As the only access to the 150 level is through a manway beyond this bad area, work could not be considered on the 150 or in the southern part of 5 level unless a second exit were developed. A connection with the 4 level tunnel in the Yankee vein area would provide the needed exit. Even if the connection with 4 level were made, a crew should not work in the lower levels of the mine as long as the manway through the caving Estella stopes is the only way in and out of the working area. This means that the 150 portal would have to be opened, or a connection with the Getchell tunnel would have to be made from the ore pass on the 150 level before any exploration or development could be conducted there.

GENERAL GEOLOGY

For details of regional geology and stratigraphy, reference should be made to the earlier reports by Burgess (1926), Stephenson (1956), Lawrence (1965), and Payne (1967).

ROCK TYPES

Only two rock units are represented in the underground workings of the Betty O'Neal mine, the Ordovician Valmy formation and a series of

Tertiary intrusives. The Valmy is represented mainly by thin-bedded cherts and quartzites with minor amounts of limestone and argillite. The intrusive rocks, in the form of dikes, are usually highly altered to a tan clay with sparsely scattered quartz "eyes". In some areas, however, the dike rock is silicified and is clearly recognizeable as an intrusive quartz porphyry.

It is felt that rock type has not played a direct role in mineralization at the Betty O'Neal mine. The main role of rock type is believed to have been a control of structure. The shale members of the Valmy formed planes of weakness for later shearing. These shear zones have formed traps for vein mineralization. The central part of the mine, near the main ore shoot of the Estella vein, is within a lense of fine grained quartzite, which being brittle, allowed greater breakage along the shear zones, and caused the vein to split into its various branches. These zones of weakness were repeatedly opened and later mineralized. Where the veins are contained in chert walls, the structures narrow and tend to steepen. This cannot be an altogether unfavorable condition, as the narrow veins mined on the S and SL levels above Number 4 tunnel were very high-grade.

STRUCTURE

The entire block of Valmy formation in which the Betty O'Neal mine is located lies in the upper plate of the Roberts Mountains thrust sheet.

Many of the flat shear structures in the mine probably formed during the time of regional thrusting and occurred as a result of failure along less competent shale lenses within the Valmy formation. Three distinct vein systems have been mapped in the underground workings. The northwest striking, northeast dipping Betty vein structure is seen only in the Chloride #2 and Powder adits. The northeast striking, northwest dipping Estella-Kinkaid-Nebraska vein system is well exposed in the Numbers 1 through 5 tunnels and on the 150 level. The third system, the northeast striking, vertical, Yankee structure is exposed in the Yankee and McGarr adits as well as in the Numbers 4 and 5 tunnels.

Not enough information is available on the Betty vein system to support a discussion.

The Estella-Kinkaid vein and the Nebraska vein have formed along flat-dipping shear zones, possibly related to the underlying thrust structure. The Estella-Kinkaid vein on Numbers 4 and 5 level and the 150 level forms a Cymoid loop structure. Proceeding from the south, the vein splits into two parallel portions near the south end of Number 4 tunnel. The northwestern or hanging wall portion of the vein, called the Estella, was well mineralized and accounts for the bulk of the Betty O'Neal production to date. Portions of the footwall vein, or Kinkaid, are not explored and could contain unknown ore reserves.

The Yankee vein is perhaps the most persistent structure in the mine. It can be traced, both on surface and underground, from the Yankee adit to beyond the glory hole area north of the Number 4 and 5 portals. The dip of the Yankee varies from vertical to 75° in either direction, with vertical predominating. The Yankee, while weakly mineralized, contained ore shoots only in those areas where the Estella or Kinkaid intersected it.

A. L. Payne, in his report of 1967, describes the possibility that the Yankee vein cuts the Estella structure and the Kinkaid vein represents a down-faulted portion of the Estella. This could be true, but the recent mapping seems to indicate that there are two distinct veins on each side of the Yankee in the central part of the mine. To the south, the Cymoid structure is apparent and the veins merge into one.

In either case, the Yankee structure and its related intersections form the bulk of the remaining exploration targets in the Betty O'Neal mine.

VEIN MINERALIZATION

Little can be added to what is already written on vein mineralization by Burgess, Stephenson, Lawrence and Payne. It is felt that there are at least three distinct periods of mineralization, an early barite-quartz stage, a later quartz stage, and an even later calcite stage. The veins are brecciated and some show all three stages of mineralization; fragments of barite included in blue-white vein quartz with open vugs filled

with calcite crystals. The barite contains a small amount of silver mineralization, the middle quartz stage contains the silver-bearing tetrahedrite and sphalerite, and the late calcite stage appears to be barren. In the Estella stope on Number 5 level, it appears that the main Estella vein, a massive barite-carbonate structure about four feet thick, was low in mineralization as it was not mined. However, near the stope area, small blue-white quartz veins can be seen lacing the pillars and walls.

EXPLORATION POTENTIAL

There are several areas in the old workings which may contain small tonnages of mineable ore. Payne has described some of these in his earlier reports. The underground sampling has indicated others, and the maps attached to this report show still more. These are, for the most part, small unmined segments of veins, pillars left in mined areas, or simply areas of mill grade rock developed by leasers who operated late in the life of the mine long after the mill was removed from the property. None of these areas will be discussed in this report. Only small tonnages are involved and they would be important only if a large orebody is developed elsewhere in the mine. The large orebody would be necessary to justify a mill, and the small pockets of ore would then be of value. The mapping indicated several exploration targets with large tonnage potential. These areas are described in the following sections.

EXPLORATION RECOMMENDATIONS

The exploration recommendations contained in this report are centered on the theory the Yankee vein intersections with the Estella and Kinkaid vein are the most favorable areas for ore formation.

This makes it imperative to know the relationship of the Yankee to the other veins. A. L. Payne indicates the Estella may be down-dropped to the southeast across the ~~Estella~~ Yankee, and the Kinkaid therefore represents the upper portion of the Estella.

The 1969 mapping leads to the belief that the Estella and Kinkaid are splits of the same vein, forming a cymoid loop in the mine area. This would allow two parallel veins to be present in the central mine area.

The first exploration work recommended, drifting and drilling along the Yankee on the 5 level, should give a clear picture of the true structural condition. When this is known, the exploration program can be adjusted to fit the actual case.

Northern Yankee-Nebraska Vein Area
(Refer to Plates IV and VII)

The large block of unexplored ground roughly bounded by the 8500 north, 9000 north and 12000 east, 12500 east coordinates is perhaps the best remaining exploration target on the Betty O'Neal property. From the southwest, the Estella, Yankee, and Kinkaid veins enter the block as exposed in the Number 5 tunnel. From the southeast, the Nebraska

vein, as exposed in the long drift at the end of Number 5 level, dips under the block. Two northwest trending faults are crossed by the 5 level drift at 12,130 east and 12,480 east. These faults could cut and offset one or all of the Estella, Yankee, and Kinkaid veins. If there has been offset, the Nebraska could actually be a faulted portion of the Estella or Kinkaid. If there has been no offset, both the Kinkaid and Nebraska veins could intersect the Yankee northeast of the Number 5 drift and northwest of the Nebraska portion of Number 5 level. It is interesting that drill hole D-9 cut good mineralization in the Nebraska vein only a short distance below the 5 level drift. The hole cuts the vein down-dip along the high point of a roll in the vein structure. This roll, if projected down to the suspected Yankee intersection, could form a good target for exploration. It is not clear what happens to the Estella vein northeast of the stope area on 5 level. The wide fault zone which ~~lies in~~ forms the hanging wall of the Estella structure on both 4 and 5 levels may swing to the northeast and cut the Estella. The northwest trending faults previously mentioned may cut and offset the Estella, or more simply, the Estella may also swing to the northeast along with the fault zone and possibly reunite with the Kinkaid at some point north of the 9000 north coordinate and east of the 12,000 east coordinate. This possibility is supported by evidence from drill hole E-1. A fault zone with underlying vein mineralization cut by the drill hole correlates with the fault and underlying Estella structure as projected from the Number 5 tunnel. The fact that the Kinkaid vein on

Number 5 level (southwest of the suspected offsetting faults) correlates very well with a vein system cut in the upper portions of drill hole D-9 (northeast of the suspected offset) may indicate that the veins project across the faults with no offset.

Exploration in this area can best be accomplished by drifting northeast along the Yankee vein from the point it crosses Number 5 tunnel. If the structure persists with no offset, the drift should be continued for 400 feet. From the end of the drift, and from a point halfway along it, two holes should be drilled to the southeast at -45° to check the projected intersection of the Kinkaid and Nebraska veins with the Yankee. From the end of the new drift, a crosscut should be driven to the northwest to check for the presence and position of the Estella vein. Since the Estella, if present, should intersect the Yankee about 150 feet above the level of the new Yankee drift, an alternate plan would be to put up a raise from the end of the drift to explore the intersection area. If ore is encountered in the drilling below Number 5 level, development could be done from the north end of the 150 level, or even from the Getchell level. The Yankee vein should persist to the Getchell, and should be intersected by the Getchell tunnel within 300 feet of its end. If the Getchell is opened, mapping should reveal the exact location of the structure. A drift could then be run along the Yankee to the northeast under any ore shoots revealed by the work on the upper levels. Raising up from the Getchell would provide access to the ore-shoots, and provide for their convenient removal from the mine.

If drifting northeast along the Yankee structure on 5 level reveals faulting has cut the veins and offset them, the Nebraska could represent either the Estella or Kinkaid veins, and the Yankee could be either northwest or southeast of the exposed vein. If the Yankee is northwest of the vein, the proposed underground drill holes from the new drift would also intersect the Yankee. If the Yankee is southeast of the exposed vein, its location could be revealed by cross-cutting to the southeast from the end of the Number 5 tunnel, or better, by drilling an exploratory hole from the surface. This hole would have to be due east of D-9, and located near 8700 north, 12,700 east. It would be vertical and should be drilled to at least 300 feet below the surface. Payne's surface mapping shows a vertical vein structure just east of the proposed hole site. This could be the offset Yankee vein, and would suggest a vein intersection at depth below the drill site.

Central Mine Area

(Refer to Plates IV and V, VII, VIII and IX)

Mapping indicates that there are three distinct veins in the central portion of the mine; the Estella, the Kinkaid, and the Yankee. Section B-B' shows their relationship as exposed along the Number 5 tunnel. The Estella and Kinkaid are paralled structures 150 feet apart separated by the vertical Yankee vein. Most of the mine production originated in the Estella adjacent to and below the Yankee-Estella intersection. As far as is known, the Kinkaid-Yankee intersection immediately below 4 and 5 levels is not explored.

Section C-C' passes through an area where two of the three veins may intersect. The Yankee and Kinkaid may intersect here and may form a good ore-shoot.

Section D-D' is taken further south on the 4 and 5 level where both the Estella and kinkaid structures exist as separate units along with the Yankee. On the 150 level, however, only one vein exists, indicating the two veins merge into one somewhere between 4 level and the 150. Plates IV and V show this split quite clearly in plan. At a point near 7600 north, 11,550 east, the northeast trending Estella-Kinkaid vein breaks into a segment which continues to the northeast (the Kinkaid) and a segment which swings more to the north northeast (the Estella). On the 150 level, this split takes place further north at a point near 8050 north, 11,400 east. This indicates the split is moving both north and down along the strike of the vein.

A northeast trending fault zone, probably post mineral, parallels the Estella vein and lies to the northwest of it. The fault is exposed in the drift near the intersection of 8000 north and 11,550 east, in the Y area of 4 level at 8170 north, 11,550 east, and turns to cut the Estella structure just north of the Number 5 tunnel near 8600 north, 11,800 east. The Estella ore shoot, as mined to date, seems to have occurred above the northeast raking Estella-Kinkaid intersection, below the Yankee-Estella intersection, and south of the cross-cutting fault. This may explain why no Estella structure was found on the level of the Getchell tunnel.

The Estella-Kinkaid split would occur far to the north of the Getchell tunnel. The combined Estella-Kinkaid structure should have been cut by the Getchell tunnel, but the point of intersection may be in the tight portion of the cymoid loop structure and may be represented by only an uninteresting fault zone with no vein mineralization. The main exploration target remaining in the central part of the mine is the Kinkaid portion of the split vein system in the area where it may intersect and pass through the Yankee structure. This is the portion of the Kinkaid vein lying between sections B-B' and C-C', and would be directly below the Yankee vein exposed in the drift starting at 8520 north, 11,940 east. This vein is cut on the 150 level, and is not ore grade material. Therefore, if an ore shoot is present, it does not extend far below the level of the Number 5 tunnel. Since the Estella ore shoot rakes to the north down-dip along the strike of the vein, a small tonnage of ore could exist in the area below and north of the 150 level. The zone is probably cut by a northeast fault north of the stope area on the 150 level.

Exploration for the Kinkaid structure could best be done by drifting southwest along the Yankee from Number 5 tunnel to the Number 4 tunnel. The suspected Yankee-Kinkaid intersection should be 150 feet south of the end of the present drift. One vertical hole should be drilled from an underground station along the Number 5 tunnel on the northwest side of the Yankee structure. This hole would investigate the Kinkaid vein

below its inferred intersection with the Yankee.

Southern Yankee-Kinkaid Area

(Refer to Plates II, III, IV, V, IX, X, and XI)

As can be seen on A. L. Payne's surface geologic map of the mine, the Kinkaid vein roughly parallels the Yankee in the Treasury Hill area between the two Kinkaid adits. To the northeast, the Kinkaid swings northwest through the Number 1 and 2 tunnels and probably intersects the Yankee in the glory hole area north of the Number 3 portal. The intersection of the two structures should have the form of a V-shaped trough with the bottom raking to the southwest. This intersection should occur just above the level of the Number 4 tunnel where shown on sections D-D' and E-E'. Actually, the mining done in the S-227 raise above 4 level was probably done on the intersection zone. South of the S-227 raise, the intersection should fall below the level of the Number 4 tunnel. Further south, on the area shown by Section F-F', the intersection should be about 70' below the level of the 150 tunnel. There is a good possibility the Estella vein is merely a hanging-wall split of the Kinkaid. In the central portion of the mine, there are the two separate veins, but to the southwest beyond about 7600 north on 4 level, the two join. If this is true, the vein cut at 535' in drill hole D-3 is the Estella-Kinkaid vein northwest of the Yankee and would indicate the Kinkaid structure crosses the Yankee and continues down-dip beyond it. In the central portion of the mine, the main ore shoots formed at or near the

intersections of the Estella vein with the Yankee, therefore this inferred Yankee-Kinkaid intersection offers a good exploration target along its entire length.

Diamond drill holes D-2, D-4, K-1, and K-2 were all positioned to explore the down-dip extensions of the Kinkaid vein. Had the holes been deep enough, they would have cut the Kinkaid some distance above the Yankee intersection, and may not have cut interesting mineralization. Of the four holes, only K-2 cut what is probably the Kinkaid structure; K-2 intersected a thickness of porphyry in the area where the vein should nave been cut. A fault zone beneath the porphyry probably represents the vein structure.

Two additional diamond drill holes are recommended to explore the southern Yankee-Kinkaid area. One of these should be southeast of the Yankee vein near 6770 north, 11,470 east. The hole would need to be 600' deep. It would explore for the Kinkaid, and also cut the projection of the leached vein zones found in Hole D-2. Another hole should be drilled across the Yankee structure to the northwest in the vicinity of 6700 north, 10,900 east. This would explore for a continuation of the Kinkaid beyond and below the Yankee intersection. The hole would need to be 800' deep.

The only underground exploration possible in this area would have to be done from either the Getchell or 150 levels. Prior to any work, the

Getchell tunnel would have to be rehabilitated to its extreme southern end or the 150 level portal reopened and the 150 level cleaned out to its southern end. Possibly, if the Getchell is opened, work could be conducted from the 150 level through a connection with the Getchell, making it unnecessary to reopen the 150 portal. From the 150 level, underground exploration would consist of extending the cross-cut at 8280 north, 11,675 east an additional 120' southeast to cut the projected Yankee structure. A drift would then be run southwest along the strike of the Yankee. From this drift, several angle drill holes, drilled at 45° should be drilled to cut the Kinkaid vein. The vein should lie about 70' below the drift to the southeast. Any ore developed could be mined by drifting under the area from the Getchell tunnel and raising to intersect the structure. Hole D-2, while not deep enough to cut the Kinkaid, did cut leached vein structures at 115 and 130 feet below its collar. These could represent blind veins and indicate the possibility of enriched zones further down-dip.

BETTY O'NEAL VEIN

The betty O'Neal portion of the mine is largely inaccessible. The Chloride #2 and Powder adits are the only open workings which expose the Betty vein. Diamond drill hole B-1, drilled southwest of the Chloride and Powder adits, cuts vein material at 160 and 280 feet below the collar. Neither of these intersections could be the Betty vein unless the dip

reverses between the mine workings and the drill hole. Hole D-6 lies south of the Betty vein area, but does not show any trace of vein or mineralization. The recent mapping does not add any information to what is known of the Betty structure. The strike of the vein does project to a possible intersection with the Estella in the area of the main Estella stopes on the 5 and 150 levels. This intersection may have played an important part in the formation of the Estella ore shoots.

Exploration in the Betty area can best be done by following Payne's suggestion of drifting southeast from the end of the Chloride #2 adit along the exposed vein. If other work dictates that the 150 level portal and drift be rehabilitated, then the exposed workings should be mapped. The Betty vein should be seen in the area near the old Betty shaft. Mapping should shed light on the remaining potential of the vein.

CONCLUSIONS

Mapping at the Betty O'Neal mine during 1969 has revealed that the best remaining exploration targets lie to the north and south of the major part of the old mine area.

The best area is thought to be the large block of ground northeast of the Number 5 tunnel. The one drill hole in the area (D-6) is mineralized, and the area is large enough to contain a major orebody. The Estella ore shoot rakes to the north down-dip, and unless it is cut by faulting, could be present in this block.

The number two target area is thought to be the Yankee-Kinkaid intersection in the southern portion of the mine. O. M. E. hole D-3, which cut good mineralized vein material, is in the northern part of this area.

There are many areas in the old portion of the mine which could contain small tonnages of mill-grade ore. The aggregate tonnage of all these is not large, and would be important only if one large ore body were developed elsewhere in the mine.

Respectfully submitted,

Joseph V. Tingley
Mining Geologist

APPENDIX

DRILL HOLE LOG

Project O.M.E. Area Betty O'Neal Hole No. B-1

Location: Depth 325 Page 1 Of 2

North 8,956 Inclination 90 From ( ) ( ) ( ) ( ) ( )

East 10,796 Bearing Vertical To

Elev. 5693 Logged by J.V.T. Date Started 6/4/66 Date Stopped 6/25/66

Footage From	Footage To	Footage Feet	Footage Rec'y	% Rec'y	Description	Sample Number
18	29	11			No core	
29	30	1			Gray, fine grained limey quartzite, laced with vitreous quartz veinlets	
30	70	40			Soft, black graphitic shale and fault gouge	
70	80	10			Sugary textured limey quartzite, light gray, laced with silica veinlets.	
80	108	28			Mainly gray-black carbonaceous shale and soft black gouge with crushed white calcite	
108	113	5			Gray-black carbonaceous shale and gouge, 1 to 5% pyrite in spots.	
113	115	2			Same, with +5% pyrite and considerable milky quartz in silicified groundmass.	
115	145	30			Gray-black carbonaceous shale w/ 1-5% pyrite	
145	150	5			Gray silicified sandstone grading into highly crushed fault zone.	
150	152.5	2.5			Soft black carbonaceous gouge, at 152.5, 3" wide milky white barite-quartz vein. Quartz in angular fragments in white barite matrix, black sulfide mineral present in quartz fragments.	
152.5	155	2.5			Soft, black, carbonaceous gouge	
155	156	1			Gray chert	
156	159	3			Crushed zone, about 70% quartz and calcite some barite, silicified quartzite gangue.	
159	166	7			Black crushed graphitic shale, inclusions of silicified quartzite	

DRILL HOLE LOG

Project O.M.E. Area Betty O'Neal Hole No. B-1

Location: Depth ( ) ( ) ( ) ( ) ( )

North Inclination From To

East Bearing

Elev. Logged by Date Started Date Stopped

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Footage				% Rec'y	Description	Sample Number
From	To	Feet	Rec'y			
166	229	63			Graphitic gouge in black carbonaceous shale, some clots of white calcite.	
229	235	6			Same	
235	250	15			White, very fine grained, sandy, dolomitic limestone (?)	
250	272	12			Same, with 6" wide brecciated zones at 250.5 and 260.5.	
272	273	1			crushed limestone	
273	274	1			Black graphitic gouge, 2" kaolinized quartz porphyry at 274.	
274	287	13			Black graphitic gouge grading into brecciated gray-black shale w/ milky white quartz veining.	
287	325	38			White, sandy, dolomitic limestone w/ finely dissem. pyrite.	
					END OF HOLE	

GRAPHIC DRILL LOG

Project O. M. E. Hole Number B-1

Area Betty O'Neal Page 1 of 1

Depth	Rock Type, Structure	Alteration	Minerals	Analysis
Surface				Ag (oz./ton)
20'	No Core			0.05
40'	Graphitic Shale			0.04
50'				0.01
80'	Quartzite			0.01
100'	Carbonaceous Shale		Calcite; 1-5% Pyrite	0.15
120'			+5%	0.16
140'	Fault zone		1-5%	0.18
160'	← 152.5 Fault zone		Barite-quartz veins; Black sulfide(?)	0.26
180'			Clots of calcite	Tr.
200'	Carbonaceous shale			Tr.
220'				Tr.
240'				Tr.
260'	Quartz porphyry 2" at 274'			Tr.
280'				Tr.
300'	Sandy dolomite		disseminated pyrite; ← Quartz veining	0.27
320'				Tr.
325' (T.D.)				Tr.

DRILL HOLE ASSAY LOG

Hole No. B-1

Project O.M.E.
Coordinates 8,956 N
10,796 E
Elevation 5693

Area Betty O'Neal
Inclination 90°
Bearing Vertical
Drill type Diamond

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Date started 6/4/66
Date stopped 6/25/66
Log by D.W.G.

Betty O'Neal Claim

Total Depth 325

Footage				%	Sample	Analysis					
From	To	Feet	Rec'y	Rec'y	No.	oz Au	oz Ag	% Cu			
0	20	20	0.0	Slge.			0.05				
20	40	20	0.0	Slge.			0.04				
40	60	20	1.0	5			0.01				
60	80	20	3.0	15			0.01				
80	100	20	3.0	15			0.15				
100	120	20	5.0	25			0.16				
120	140	20	4.0	20			0.18				
140	160	20	8.0	40			0.26				
160	180	20	6.0	30			Tr				
180	200	20	5.0	25			Tr				
200	220	20	4.0	20			Tr				
220	240	20	7.0	35			Tr				
240	260	20	14.0	70			Tr				
260	280	20	5.0	25			Tr				
280	300	20	19.0	95			0.27				
300	320	20	10.0	50			Tr				
320	325	5	4.0	90			Tr				

DRILL HOLE LOG

Project O. M. E. Area Betty O'Neal Hole No. D-2

Location: North 6,500 East 11,598 Elev. 6402

Depth 375' Inclination 90 Bearing Vertical

Logged by J.V.T. Date Started 10/18/65 Date Stopped 11/28/65

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Footage From	Footage To	Footage Feet	Rec'y	% Rec'y	Description	Sample Number
51	71	20			Bleached, kaolinized quartz porphyry 51-52, then tan-gray bleached quartzite, frac. system at 30 to core, 1/8"-1/4" clear quartz veinlets ~~in fractures, br. and cinn. br. limonite in~~ cavities, Mn staining at 58', last 10' brecciated, some recementing, clear stubby quartz crystals ~~in vugs, limey at 70'.~~	
71	105	34			Tan-gray moderately silicified limestone, slightly fractured, sparse -1/4" white calcite veining in ~~fractures at 30 to core, black Mn "spots" on~~ irregular frac. surfaces.	
105	114	9			Tan-gray to buff moderately silicified limestone, grading to limey siltstone, fractured w/ some ~~clear calcite veining at 180 to core(parallel)~~ red br. and cinn. br. limonite coatings on some frac. surfaces, dendritic Mn coatings.	
114	122	8			Buff silic. limestone grading to limey quartzite at 119-122, breccia zone at 114-116, possible ~~leached vein system, considerable limonite~~ coated vugs and fracture coatings, -1/16" calcite veinlets w/ square hematite cubes.	
122	134	5			Limey quartzite, grading to silic. limestone at 130-134, dendritic Mn coating on frac. surfaces, ~~vuggy leached vein at 130-131, milky quartz~~ with cinn. br., and "live" limonite-filled sulfide casts.	
134	154	20			Massive, fine-grained limonite-hematite gossan w/ Mn clots at 134-138; 138-143, no core; ~~143-152, Moderately fractured tan-gray silic.~~ limestone w/ thin calcite veinlet.	

DRILL HOLE LOG

Project O.M.E. Area Betty O'Neal Hole No. D-2

Location: Depth ( ) Page 2 Of 3

North Inclination ( )

East Bearing ( )

Elev. Logged by Date Started Date Stopped

Footage From	Footage To	Footage Feet	Rec'y	% Rec'y	Description	Sample Number
154	177	23			Silic. limestone 154-165, narrow calcite veinlets mod. Mn staining, 165-170, no core, 170- 177, Feox stained mod. kaolinized quartz porphyry, black Mn coatings on frac. surfaces, some fairly fresh rock showing gray-white feldapar, quartz and +5% pyrite.	
177	186	9			177-180, irregular brecciated limestone and silic. limestone w/ some altered porphyry, 180-186, Feox and Mn stained quartz porphyry, mod. altered, pink in appearance.	
186	203	17			186-192, altered quartz porphyry, brecciated zone at 192, possible fault contact w/ light gray, fine-grained quartzite	
203	211	8			Dense, fine-grained gray-white silic. quartzite hair-line frac. recemented w/ silica, pyrite and minor chalcopyrite in veins, irregular spots of oxidation.	
211	220	9			Fractured gray-white quartzite w/ pyrite veinlets and clots up to 1/4" thick and 1" in diameter, 11/2" thick quartz vein at 215.6' containing galena and minor pyrite.	
220	232	12			Gray quartz porphyry, gray groundmass w/ white phenocrysts, 1-5% dissem. pyrite, large clots of pyrite and sphalerite at 226'.	
232	270	38			Gray to black quartzite and chert, minor calcite veining	
270	292	22			White talc zone at 270, followed by white, fine-grained quartzite.	

DRILL HOLE LOG

Project O.M.E. Area Betty O'Neal Hole No. D-2

Location: Depth ( ) Page 3 Of 3

North ( ) Inclination ( ) ( )

East Bearing ( ) ( )

Elev. Logged by Date Started Date Stopped

Footage From	Footage To	Footage Feet	Footage Rec'y	% Rec'y	Description	Sample Number
292	309	17			Quartzite to 300', then bleached, mod. kaolinized shale and siltstone, highly crushed and contorted.	
309	317	8			Gray-white, bleached limey quartzite and siltstone, dull green talk on shear surfaces.	
317	326	9			Same, grades into black, crushed shale at 321, bleached chert at 326.	
326	336	10			Crushed, bleached, fine-grained quartzite and chert, talc on shear faces, some chlorite and pyrite.	
336	346	10			Same, serpentine coatings on shear faces, rock dark gray-green.	
346	355	9			Gray to gray-black crushed quartzite, chert, and shale, dark green serpentine on shear faces, calcite pods and veinlets throughout.	
355	364	9			Same to 360, minor chalcopyrite, 359-360, black and dark brown-black limestone(?) breccia w/ siliceous fragments, minor quartz-calcite veining.	
364	373	9			Dense black limey quartzite, mod. brecciated w/ quartzite and chert fragments, minor pyrite and calcite veining.	
373	375	2			Same.	
					END OF HOLE	

GRAPHIC DRILL LOG

Project O. M. E.

Hole Number D-2

Area Betty O'Neal

Page 1 of 2

Depth	Rock Type, Structure	Alteration	Minerals	Analysis Ag (oz. per ton)
Surface				
20'				
40'				
60'			Quartz veining	0.29
80'				0.02
100'		Silicified		0.04
120'	Pos. leached vein		Quartz veining	0.01
140'	} Leached vein		Quartz veining	0.40
160'			+5% pyrite	0.02
180'				0.06
200'			Chalcopyrite	0.02
220'			Quartz vein	0.14
240'			Galena	0.03
260'			Sphalerite	Tr.
280'				Tr.
300'		Kaolinized		Tr.
320'				Tr.

GRAPHIC DRILL LOG

Project O. M. E. Hole Number D - 2

Area Betty O'Neal Page 2 of 2

Depth	Rock Type, Structure	Alteration	Minerals	Analysis
320'				
340'			Calcite veining	0.04
360'				0.01
375'	T.D.			0.01

DRILL HOLE ASSAY LOG

Hole No. D-2

Project O.M.E.
Coordinates 6,500 N
11,598 E
Elevation 6402
Yankey Claim

Area Betty O'Neal
Inclination 90°
Bearing Vertical
Drill type Diamond

Page 1 of 1
Date started 10/18/65
Date stopped 11/28/65
Log by D.W.G.
Total Depth 375

Footage				%	Sample	Analysis					
From	To	Feet	Rec'y	Rec'y	No.	oz Au	oz Ag	% Cu	% Pb	% Zn	
0	110	110		Slge.			0.03				
160	170	10		Slge.			0.38				
210	220	10		Slge.		0.015	0.32				
185	200	15		Slge.			0.07				
211	220	9	8.0	90		0.06	0.93	0.03	0.51	0.47	
211	216	5	4.5	90			0.86				
216	220	4	3.5	90			0.58				
50	70	20	9.0	45			0.29				
70	90	20	3.0	15			0.02				
90	110	20	9.0	45			0.04				
110	130	20	14.0	70			0.01				
130	150	20	12.0	60			0.40				
150	170	20	13.0	65			0.02				
170	190	20	11.0	55			0.06				
190	210	20	17.0	85			0.02				
210	230	20	12.0	60			0.14				
230	250	20	6.0	30			0.03				
250	270	20	3.0	15			Tr				
270	290	20	1.0	5			Tr				
290	310	20	10.0	50			Tr				
310	330	20	19.0	95			Tr				
330	350	20	19.0	95			0.04				
350	375	25	25.0	100			0.01				

DRILL HOLE LOG

Project O.M.F. Area Betty O'Neal Hole No. D-3

Location: North 7,335 East 11,171 Elev. 6130

Depth 614 Inclination 90 Bearing Vertical

Logged by J.V.T. Date Started 11/29/66 Date Stopped 1/26/66

Page 1 Of 3

( ) ( ) ( ) ( ) ( )

From ___ To ___ ___ ___ ___ ___

Footage From	Footage To	Footage Feet	Rec'y	% Rec'y	Description	Sample Number
41	50	9			Crushed, bleached quartzite, shale, and chert veined w/ red-br. limonite veinlets	
50	97	-			No core	
97	106	9			Black contorted fault material, slickensided surfaces	
106	216	210			Dense black carbonaceous shale and quartzite, sheared and contorted, pyrite on shear faces and fractures, minor Feox staining, threadlike veinlets of pyrite and quartz appear at 159,	
216	225	9			Dense grey-black quartzite and chert, fine-grained pyrite in disseminations and veinlets, minor Feox staining, last 3' black carbonaceous shale.	
225	257	32			Black carbonaceous shale, shiney slickensided surfaces.	
257	281	24			Dense black quartzite and chert, graphitic shear coatings,	
281	353	72			Light grey, silic. quartzite, minor Feox staining, mod. brecciated, sparse pyrite, breccia zone 326-340 w/ white calcite veinlets	
353	377	24			Black to grey-black brecciated quartzite grading into black carbonaceous shale at 365.	
377	412	25			Bleached, silic. limestone, brecciated w/ talc gouge on shear surfaces	

DRILL HOLE LOG

Project O.M.E. Area Betty O'Neal Hole No. D-3

Location: Depth ( ) ( ) ( ) ( ) Page 2 Of 3

North Inclination From To

East Bearing

Elev. Logged by Date Started Date Stopped

Footage				% Rec'y	Description	Sample Number
From	To	Feet	Rec'y			
412	413	1			Grey-black fault gouge	
413	443	30			Brecciated fine-grained, grey quartzite, considerable calcite veining 441-442.	
443	470	27			Sheared black shale, grey quartzite, grey-green talc on shear surfaces, minor calcite veining and pyrite.	
470	488	18			Grey, limey quartzite, highly fractured.	
488	495	7			Fine-grained siltstone w/ limey fracture coatings, minor pyrite.	
495	505	10			Grey-green silic. limestone and quartzite, pyrite along irregular fracture surfaces, trace chalcopyrite.	
505	518	13			Same to 508, then black carbonaceous gouge grading into grey gouge and crushed limey quartzite.	
518	532	14			Grey-white silicified quartz porphyry w/ approx. 1% dissem pyrite, clear white quartz phenocrysts, dull white feldspar clots, altered books of mica (biotite?)	
532	543	11			Vein material, milky white, vitreous, and blue-white quartz w/ small vugs limed w/ clear quartz crystals, vein has inclusions of black, silicified wall rock, clots of black sulfides (tetrahedrite and galena?) and sphalerite at 535.5 and 537, wall rock inclusions and black graphitic partings increase toward 543/	

DRILL HOLE LOG

Project O.M.E. Area Betty O'Neal Hole No. D-3

Location: Depth ____ Page 3 Of 3

North ____ Inclination ____ From ( ) ( ) ( ) ( ) ( )

East ____ Bearing ____ To ____

Elev. ____ Logged by ____ Date Started ____ Date Stopped ____

Footage From	Footage To	Footage Feet	Footage Rec'y	% Rec'y	Description	Sample Number
543	554	11			Sheared black graphitic shale and quartzite, slickensided surfaces, grades to grey-black quartzite with pyrite and trace chalcopyrite at 553-554.	
554	574	20			Grey-black to blace silic. quartzite, graphitic shear coatings, dissem. pyrite, drusy thin calcite and quartz coatings on frac. surfaces.	
574	576	2			Grey-black loosely cemented sand (?) composed of sized black shale and quartz fragments, weak calcite cement.	
576	595	19			Sheared black quartzite and shale.	
595	597	2			Possible vein zone, white and clear vitreous quartz with inclusions of black wall rock	
597	614	17			Brecciated black quartzite and chert, calcite veining, clear quartz veining w/ pyrite and sphalerite at 601 (-1/8" wide).	
					END OF HOLE	

GRAPHIC DRILL LOG

Project O. M. E.

Area Betty O'Neal

Hole Number D - 3

Page 1 of 2

Depth	Rock Type, Structure	Alteration	Minerals	Analysis
				Ag (oz./ton)
Surface				
40'				
80'				
100'			Quartz veinlets	
120'			Pyrite veining	Tr.
140'				Tr.
160'				0.02
180'				0.08
200'				Tr.
220'				Tr.
240'				Tr.
260'				0.02
280'				Tr.
300'		Silicified		Tr.
320'				Tr.

GRAPHIC DRILL LOG

Project O. M. E. Hole Number D - 3

Area Betty O'Neal Page 2 of 2

Depth	Rock Type, Structure	Alteration	Minerals	Analysis
320'				Ag (oz./ton)
340'				Tr.
360'				Tr.
380'		Silicified		Tr.
400'				0.02
420'				Tr.
440'			Calcite veining	Tr.
460'				Tr.
480'				0.03
500'			Tr. chalcopyrite	Tr.
520'				Tr.
540'	Vein 532'-543'	Silicified	Tetrahedrite Galena; Quartz vein; Tr. chalcopyrite; Disseminated pyrite	535'-540', 8.06 21.86 oz.
560'				1.26
580'			Quartz vein; Sphalerite	Tr.
600'				1.14
614'	T.D.			1.05

DRILL HOLE ASSAY LOG

Hole No. D-3

Project O.M.E.
Area Betty O'Neal
Page 1 of 2
Coordinates 7,335 N
11,171 E
Inclination 90°
Date started 11/29/65
Bearing Vertical
Date stopped 1/26/66
Elevation 6130
Drill type Diamond
Log by D.W.G.

Betty O'Neal South Claim
Total Depth 614

Footage				%	Sample	Analysis					
From	To	Feet	Rec'y	Rec'y	No.	oz Au	oz Ag	% Cu			
0	20	20		Slge.							
20	40	20		Slge.							
40	60	20		Slge.							
60	80	20		Slge.							
80	100	20		Slge.							
100	120	20	13.0	65			Tr				
120	140	20	20.0	100			Tr				
140	160	20	20.0	100			0.02				
160	180	20	17.0	85			0.08				
180	200	20	7.0	35			Tr				
200	220	20	8.0	40			Tr				
220	240	20	12.0	60			Tr				
240	260	20	10.0	50			0.02				
260	280	20	19.0	95			Tr				
280	300	20	17.0	85			Tr				
300	320	20	15.0	75			Tr				
320	340	20	15.0	75			Tr				
340	360	20	19.0	95			Tr				
360	380	20	18.0	90			Tr				
380	400	20	12.0	60			0.02				
400	420	20	11.5	57			Tr				
420	440	20	5.0	25			Tr				
440	460	20	14.0	70			Tr				
460	480	20	8.0	40			0.03				
480	500	20	14.0	70			Tr				
500	520	20	17.0	85			Tr				
520	540	20	20.0	100			8.06				
540	560	20	12.0	60			1.26				
560	580	20	8.0	40			Tr				
580	600	20	7.0	35			1.14				
600	614	14	2.0	14			1.05				

DRILL HOLE ASSAY LOG

Hole No. D-3

Project _____ Area _____ Page 2 of 2

Coordinates _____ N Inclination _____ Date started _____

_____ E Bearing _____ Date stopped _____

Elevation _____ Drill type _____ Log by _____

Footage				%	Sample	Analysis					
From	To	Feet	Rec'y	Rec'y	No.	oz Au	oz Ag	% Cu			
520	525	5	5.0	100			0.02				
525	530	5	5.0	100			0.03				
530	535	5	5.0	100			8.27				
535	540	5	5.0	100			21.86				

DRILL HOLE LOG

Hole No. D-4

Project O.M.E. Area Betty O'Neal Page 1 Of 1

Location:

North 6,732

East 11,728

Elev. 6357

Depth 150

Inclination 90

Bearing Vertical

Logged by J.V.T.

Date Started 3/29/66 Date Stopped 4/4/66

	( )	( )	( )	( )	( )
From					
To					

Sample Number	Description	% Rec'y	Footage From	Footage To	Footage Feet	Footage Rec'y
	Brecciated buff quartzite, Feox staining on fracture surfaces, grades to grey quartzite w/ some grey shale partings, minor pyrite.		40	150	110	
	END OF HOLE					

GRAPHIC DRILL LOG

Project O. M. E.

Hole Number D-4

Area Betty O'Neal

Page 1 of 1

Depth	Rock Type, Structure		Alteration					Minerals					Analysis			
Surface													Ag (oz./ton)			
20'													0.04			
40'													0.05			
60'								Minor pyrite					0.08			
80'																
120'													Tr.			
140'													0.03			
150'	T.D.												0.05			

DRILL HOLE ASSAY LOG

Hole No. D-4

Project O.M.E.
Coordinates 6,732 N
11,728 E
Elevation 6357
Kinkaid Claim

Area Betty O'Neal
Inclination 90°
Bearing Vertical
Drill type Diamond

Page 1 of 1
Date started 3/29/66
Date stopped 4/4/66
Log by D.W.G.
Total Depth 150

Footage				%	Sample	Analysis					
From	To	Feet	Rec'y	Rec'y	No.	oz Au	oz Ag	% Cu			
30	50	20	1.5	8			0.04				
50	70	20	1.0	5			0.05				
70	90	20	1.0	5			0.08				
90	110	20	1.0	5			Tr				
110	130	20	1.5	8			0.03				
130	150	20	2.0	10			0.05				

Note: All samples were composite of core and sludge.

DRILL HOLE LOG

Project O.M.E. Area Betty O' Neal Hole No. D-5

Location: Depth 350 Page 1 Of 2

North 5,501 Inclination 90 From ( ) ( ) ( ) ( ) ( ) ( )

East 11,640 Bearing Vertical To

Elev. 6299 Logged by J.V.T. Date Started 3/4/66 Date Stopped 3/26/66

Footage From	Footage To	Footage Feet	Rec'y	% Rec'y	Description	Sample Number
19	27	8			Light br. grey limestone, silty, hair line fractures @ 30 & 60 with core, white calcite along frac., minor pyrite and silica veinlets	
27	36	9			Same to 31, grades into grey black quartzite w/ minor pyrite, silica veinlets.	
36	46	10			Dense silicified rock, possibly originaly limestone, grey to grey-green, bands of pyrite ½" thick as replacements in bedding, Feox staining at 44'	
46	55	9			Same, slightly limey	
55	63	8			Grey-black, dense, fine-grained quartzite, minor calcite veinlets, ½" quartz vein @ 63', vein has chlorite along walls, white quartz pods, sulfides at edge of quartz.	
63	73	10			Same, grading into black chert, minor pyrite veinlets, calcite frac. coatings.	
73	82	9			Black chert, fine-grained black quartzite at 82'	
82	90	8			Dense black fine-grained quartzite, siliceous siltstone w/ graphitic partings, silica veinlets w/ pyrite.	
90	100	10			Dense black carbonaceous shale, minor pyrite & silica veinlets.	
100'	110	10			Same, some bands fine-grained quartzite, black chert at 108-110	

DRILL HOLE LOG

Project O.M.E. Area Betty O' Neal Hole No. D-5

Location: Depth ( ) ( ) ( ) ( ) ( )

North Inclination From To

East Bearing

Elev. Logged by Date Started Date Stopped

Page 2 Of 2

Footage From	Footage To	Footage Feet	Rec'y	% Rec'y	Description	Sample Number
110	119	9			Dense black silicified shale, some chert, minor pyrite , silica veining.	
119	129	10			Same to 121, then tan-grey silicified limestone w/ ½" wide bands of dissem. pyrite, grading into contorted fine-grained quartzite w/ shaley partings.	
129	138	9			Tan-grey silicified limestone w/ pyrite & silica veinlets, rock dense & porcelin -like, at 135', contact @ 137.5' with grey-white quartz porphyry.	
138	231	93			Grey-white silicified quartz porphyry, disseminated pyrite, mod. kaolinized at 145-147, and 202-217, fault zone at 191-192.	
231	237	6			Silicified contact zone, brecciated at 237 possible fractured vein zone at 231-237, contains white & blue-white quartz, some pyrite, and calcite veining.	
239	268	29			Pale porcelin-like grey-white chert w/ silica webbing and dissem. pyrite., some calcite veining, grades into greyish silic. fine-grained quartzite w/ black carbonaceous shale partings	
268	350	82			Brecciated grey-white chert w/ some fine-grained quartzite, shaley partings, highly contorted, pyrite veining in fine veinlets.	
					END OF HOLE	

GRAPHIC DRILL LOG

Project O. M. E.

Hole Number D - 5

Area Betty O'Neal

Page 1 of 2

Depth	Rock Type, Structure	Alteration	Minerals	Analysis
Surface				Ag (oz. / ton)
40'		Silicified	Silica veining, Minor pyrite	Tr.
80'			Qtz. veins	Tr.
120'		Silicified	Minor pyrite	Tr.
160'		Mod. Kaolinized		Tr.
200'				Tr.
240'		Silicified		Tr.
280'				Tr.
320'				Tr.

GRAPHIC DRILL LOG

Project O. M. E.

Hole Number D - 5

Area Betty O'Neal

Page 2 of 2

Depth	Rock Type, Structure	Alteration	Minerals	Analysis
320'				Ag (oz./ton)
350'	T.D.		Pyrite veining	Tr.

DRILL HOLE ASSAY LOG

Hole No. D-5

Project O.M.E.
Area Betty O'Neal
Page 1 of 1
Coordinates 5,501 N
11,640 E
Inclination 90°
Date started 3/4/66
Bearing Vertical
Date stopped 3/26/66
Elevation 6299
Drill type Diamond
Log by D.W.G.
Mike Burke Claim
Total Depth 350

Footage				%	Sample	Analysis					
From	To	Feet	Rec'y	Rec'y	No.	oz Au	oz Ag	% Cu			
20	40	20	20.0	100			Tr				
40	60	20	20.0	100			Tr				
60	80	20	20.0	100			Tr				
80	100	20	20.0	100			Tr				
100	120	20	20.0	100			Tr				
120	140	20	20.0	100			Tr				
140	160	20	20.0	100			Tr				
160	180	20	20.0	100			Tr				
180	200	20	20.0	100			Tr				
200	220	20	20.0	100			Tr				
220	240	20	20.0	100			Tr				
240	260	20	20.0	100			Tr				
260	280	20	20.0	100			Tr				
280	300	20	20.0	100			Tr				
300	320	20	20.0	100			Tr				
320	340	20	20.0	100			Tr				
340	350	10	10.0	100			Tr				

DRILL HOLE LOG

Project O.M.E. Area Betty O'Neal Hole No. D-6

Location: North 8,378 Depth 305 Inclination 90 Bearing Vertical

East 10,941 Elev. 5881 Logged by J.V.T. Date Started 1/27/66 Date Stopped 2/28/66

Page 1 Of 1

Footage From	Footage To	Footage Feet	Footage Rec'y	% Rec'y	Description	Sample Number
50	61	11			Fine-grained grey to buff quartzite, banded, soft black gouge at 51', mod. brecciated w/ Feox staining & Mn spots on frac. surfaces	
61	124	63			61-86, no core; 86-96, tan-grey bleached quartzite, fractured, w/ limonite coatings &crusts on frac surfaces; 96-118, med fine-grained grey quartzite, some limonite points, mod. fractured.; 118-124, soft black carbonaceous shale, contorted w/ graphitee coatings on shear surfaces, minor Feox sataining	
124	147	23			No core, no record of footage (?)	
147	213	66			147-151, Grey vitreous quartzite, 3" section of massive pyrite and magnetite at 151; 151-181, poor recovery, seems to be mostly chert and fine-grained grey quartzite; 181-206, Med. fine-grained grey quartzite, trace pyrite and chalcopyrite; 206-213, mostly grey chert w/ silica veinlets, mimor pyrite, some grey-black carbonaceous shale	
213	226	13			213-216, grey chert, clear silica webbing, 216-226, grey chert, dark grey quartzite, carbonaceous shale partings.	
226	245	19			Med. fine-grained grey quartzite, becomes highly fractured from 241-246, calcite veining and cementing in frac. zone.	
245	307	62			Same to 300, 1' fault zone to 301, then very fine-grained quartzite and grey-white chert w/ some carbonaceous shale partings, some dissem. pyrite.	
					END OF HOLE	

GRAPHIC DRILL LOG

Project O. M. E.

Hole Number D - 6

Area Betty O'Neal

Page 1 of 1

Depth	Rock Type, Structure	Alteration	Minerals	Analysis
Surface				Ag (oz./ton)
40'	No record			
80'				Tr.
100'	No record			0.01
120'				0.01
140'	No record			
160'			Pyrite	Tr.
200'			Tr. pyrite Tr. chalcopyrite 3" vein Magnetite	0.01
240'				Tr.
280'			Main vein pyrite	Tr.
300' 305'	T.D.			Tr.

DRILL HOLE ASSAY LOG

Hole No. D-6

Project O.M.E.
Coordinates 8,378 N
10,941 E
Elevation 5881

Area Betty O'Neal
Inclination 90°
Bearing Vertical
Drill type Diamond

Page 1 of 1
Date started 1/27/66
Date stopped 2/28/66
Log by D.W.G.

Betty O'Neal Claim

Total Depth 305

Footage				%	Sample	Analysis					
From	To	Feet	Rec'y	Rec'y	No.	oz Au	oz Ag	% Cu			
50	65	15	11.0	73			Tr				
85	100	15	2.0	13			0.01				
100	125	25	4.0	16			0.01				
140	155	15	1.0	7			Tr				
170	200	30	1.0	3			0.01				
200	220	20	11.0	55			Tr				
220	240	20	10.0	50			Tr				
240	245	5	4.0	90			Tr				
245	265	20	16.0	80			Tr				
265	285	20	8.0	40			Tr				
285	305	20	6.0	30			Tr				

DRILL HOLE LOG

Project O.M.E. Area Betty O'Neal Hole No. D-7

Location: Depth 205' ( ) ( ) ( ) ( ) Page 1 Of 1

North 7,685 Inclination 90° From ___ To ___

East 12,570 Bearing Vertical

Elev. 6347 Logged by J.V.T. Date Started 4/5/66 Date Stopped 4/18/66

Footage From	Footage To	Footage Feet	Footage Rec'y	% Rec'y	Description	Sample Number
18	46	28			Gray-black silty limestone, pod of gray chert	
					at 27', rock moderately fractured w/ Feox staining	
46	56	10			Broken zone, core lost, appears to be quartzite,	
					gray to black, minor barite veining, last 6"	
					black carbonaceous shale.	
56	71	15			Greenish silicified limestone, irregular patches	
					of calcite and pyrite.	
71	76	5			Fractured, gray-black argillite and quartzite.	
76	103	27			Gray and gray-white chert, moderate dissem.	
					pyrite, fractured, 1" barite veinlet at 79',	
					minor Feox staining .	
103	110	7			Gray-white to greenish dense silicified limestone,	
					with calcite and quartzite phenocrysts.	
110	111	1			Fractured white chert.	
111	151.5	40.5			Silicified limestone, gray and green-gray,	
					white and cream calcite cleavage faces spotted	
					throughout rock, clots of chlorite and pyroxene,	
					possibly some epidote, minor dissem pyrite.	
151.5	177	25.5			Dense gray-white chert, thin webbing of dark	
					silica, minor dissem pyrite, green serpentine	
					on shear faces, carbonaceous shale partings.	
177	205	28			Dull black carbonaceous shale, some serpentine	
					coatings on shear surfaces, minor dissem. pyrite,	
					½" calcite vein at 203.5, contains small clots	
					pyrite and trace chalcopyrite.	
					~~END OF HOLE~~	

GRAPHIC DRILL LOG

Project O.M.E.

Hole Number D - 7

Area Betty O'Neal

Page 1 of 1

Depth	Rock Type, Structure	Alteration	Minerals	Analysis
				Ag (oz./ton)
Surface				
20'				Tr.
40'				Tr.
60'		Silicified	Barite veining; Dissem. pyrite	Tr.
80'				Tr.
100'				Tr.
120'				Tr.
140'		Silicified		Tr.
160'				Tr.
180'			Pyrite; Calcite vein; Tr. chalcopyrite	Tr.
200'				Tr.
205'	T.D.			Tr.

DRILL HOLE ASSAY LOG

Hole No. D-7

Project O.M.E.
Area Betty O'Neal
Page 1 of 1
Coordinates 7,685 N
12,570 E
Inclination 90°
Date started 4/5/66
Bearing Vertical
Date stopped 4/18/66
Elevation 6347
Drill type Diamond
Log by D.W.G.
Nebraska Claim
Total Depth 205

Footage				%	Sample	Analysis					
From	To	Feet	Rec'y	Rec'y	No.	oz Au	oz Ag	% Cu			
20	40	20	19.0	95			Tr				
40	60	20	17.0	85			Tr				
60	80	20	18.0	90			Tr				
80	100	20	20.0	100			Tr				
100	120	20	20.0	100			Tr				
120	140	20	20.0	100			Tr				
140	160	20	20.0	100			Tr				
160	180	20	20.0	100			Tr				
180	205	25	25.0	100			Tr				

DRILL HOLE LOG

Hole No. D-8

Project O.M.E. Area Betty O'Neal Page 1 Of 2

Location: North 7,911 East 11,796 Elev. 6072

Depth 303 Inclination 90° Bearing Vertical

Logged by J.V.T. Date Started 5/21/66 Date Stopped 6/2/66

Footage				% Rec'y	Description	Sample Number
From	To	Feet	Rec'y			
82	91	9			Fine grained gray quartzite, gray white chert, highly brecciated, 25%-50% of rock composed of 1/8" to 1/2" veins and clots of massive and crystalline white calcite.	
91	133	42			Gray-white chert, brecciated and recemented with silica, calcite veins 1/16" thick, cut core at 60°, pyrite present in veinlets and disseminations, 1/2" thick vuggy calcite vein at 108', vugs lined with clear quartz crystals, thin bands of pyrite along contorted bedding from 119'-133', some carbonaceous shale partings from 119'.	
133	133.25				Vuggy quartz vein, 1" to 1 1/2" thick, vugs lined with tiny acicular, clear quartz crystals, doubly terminated calcite crystals, blebs of sphalerite, black tetrahedrite, and wire silver, quartz crystals coated with green-yellow waxey mineral, wire silver twined around quartz crystals, some spots of galena.	
133	140	7			Brecciated and recemented gray-white chert.	
140	148				Crushed chert, webbed by calcite veins, up to 25% rock calcite, vuggy quartz veinlets at 142.5, 143, and 144, veins show specks of tetrahedrite, sphalerite coating quartz veinlets in vugs.	
148	167	18			Brecciated gray-white chert recemented with silica , small vuggy quartz veinlet cut core at	

DRILL HOLE LOG

Project O.M.E. Area Betty O'Neal Hole No. D-8

Location: Depth ( ) ( ) ( ) ( ) ( ) Page 2 Of 2

North Inclination From To

East Bearing

Elev. Logged by Date Started Date Stopped

Footage From	Footage To	Footage Feet	Footage Rec'y	% Rec'y	Description	Sample Number
148	167	(cont.)			148-157, and 159-160, veins cut core at 30°-40°, have clear quartz crystals lining vugs, black tetrahedrite and sphalerite blebs on quartz, 1/4" veinlet at 165.5 also., chert grades into fine grained quartzite at 167'.	
167	220	53			Vitreous fine grained quartzite and argillite, random calcite veinlets, blebs of pyrite, shear surfaces coated with talc, from 174', rock contains in excess of 5% pyrite, bedding highly contorted, some brecciation and recementation, rock locally bleached, 10-15% pyrite at 220'.	
220	303	83			Silicified "spotted" shale, grading into dense black silicified quartzite and argillite, minor calcite veining and silica webbing, black carbonaceous shale at 224-228.	
					END OF HOLE	

GRAPHIC DRILL LOG

Project O. M. E. Hole Number D - 8

Area Betty O'Neal Page 1 of 1

Depth	Rock Type, Structure	Alteration	Minerals	Analysis			
Surface				Ag (oz./ton)			
40'	No record						
80'							
100'			Heavy Calcite veining	Tr.	90'	-95',	2.18
120'			Disseminated Pyrite	Tr.			
140'			Ore vein	Tr.	130'	-135',	57.35
155'			Sphalerite Tetrahedrite Wire Silver Galena	0.02			
165'				12.51			
185'			45% Pyrite	1.20			
205				0.03			
225'		Silicified	10-15% Pyrite	Tr.			
245'				0.04			
265'				Tr.			
285'				Tr.			
300'	T.D.			Tr.			

DRILL HOLE ASSAY LOG

Hole No. D-8

Project O.M.E.
Coordinates 7,911 N
11,796 E
Elevation 6072

Area Betty O'Neal
Inclination 90°
Bearing Vertical
Drill type Diamond

Page 1 of 1
Date started 5/21/66
Date stopped 6/2/66
Log by D.W.G.

Estella Nevada Claim

Total Depth 300

Footage				%	Sample	Analysis					
From	To	Feet	Rec'y	Rec'y	No.	oz Au	oz Ag	% Cu			
133	133	0				0.03	263.3				
80	100	15	15.0	100			Tr				
(Omit 90-95)											
90	95	5	5.0	100			2.18				
100	120	20	20.0	100			Tr				
120	140	15	15.0	100			Tr				
(Omit 130-135)											
130	135	5	5.0	100			57.35				
140	155	15	15.0	100			0.82				
155	165	10	10.0	100			12.51				
165	185	20	20.0	100			1.20				
185	205	20	20.0	100			0.03				
205	225	20	20.0	100			Tr				
225	245	20	20.0	100			0.04				
245	265	20	20.0	100			Tr				
265	285	20	20.0	100			Tr				
285	300	15	15.0	100			Tr				

DRILL HOLE LOG

Project O.M.E. Area Betty O'Neal Hole No. D-9

Location: Depth 451' Page 1 Of 2

North 8,693 Inclination 90° From ( ) ( ) ( ) ( ) ( )

East 12,462 Bearing Vertical To ___ ___ ___ ___ ___

Elev. 6115 Logged by J.V.T. Date Started 4/21/66 Date Stopped 5/1/66

Footage From	Footage To	Footage Feet	Footage Rec'y	% Rec'y	Description	Sample Number
75	121	46			Medium fine-grained, gray, vitreous quartzite, moderately brecciated w/ red-brown limonite coatings and films.	
121	153	32			Same, slight increase in Feox staining	
153	175	28			Same, 153-154 and 163-164 show fracture system at 5-15% to core w/ heavy cinn. br. and br. limonite coatings.	
175	181	6			Brecciated quartzite w/ calcite veining, 180-181 crushed dull gray-black shale w/ clots of MnO and calcite, calcite pink.	
181	212	31			Crushed zone with Mno extends to 182, has graphitic material on contorted shear faces, rock then grades into gray-black chert veined with thin silica and calcite veinlets, carbonaceous shale partings up to ¼" thick.	
212	230	18			Gray-black chert, no staining, quartz vein at 213', vuggy w/ leached sulfide cavities.	
230	314	84			Fine-grained, gray-black, quartzite and chert, sparse calcite veining, moderately broken w/ black carbonaceous partings, trace of pyrite.	
314	356	42			Medium-grained to fine-grained vitreous quartzite w/ white quartz veins (1/16" thick) lacing rock.	
356	371	15			Black carbonaceous gouge and shale w/ moderate dissem. pyrite.	

DRILL HOLE LOG

Project O.M.E. Area Betty O'Neal Hole No. D-9

Location: Depth ( ) ( ) ( ) ( ) ( )

North Inclination From To

East Bearing

Elev. Logged by Date Started Date Stopped

Page 2 Of 2

Footage From	Footage To	Footage Feet	Rec'y	% Rec'y	Description	Sample Number
371	406	35			Gray and gray-black, vitreous, thin-bedded quartzite, highly silicified w/ moderate pyrite, 378-379 and 380-381 contain +50% white and rose-white vein barite, thin quartz veinlets at 400.5', more barite veins at 401 and 405.	
406	451	45			Contorted, sheared, dull black carbonaceous shale and argillite, 10% pyrite in veinlets and disseminations, 2" barite vein w/ sparse pyrite at 410.5', pyrite changes to -1% at 424.	
					END OF HOLE	

GRAPHIC DRILL LOG

Project O. M. E.

Hole Number D - 9

Area Betty O'Neal

Page 1 of 2

Depth	Rock Type, Structure	Alteration	Minerals	Analysis
Surface	No record			Ag (oz./ton)
20'				0.96
40'				0.44
60'				0.22
80'				0.24
100'				0.02
120'				0.04
140'			Calcite veining	0.02
160'				Tr.
180'			Mn. staining	0.05
200'				0.30
220'			Qtz. vein	0.02
240'				Tr.
260'				Tr.
280'				Tr.
300'				Tr.
320'				Tr.

GRAPHIC DRILL LOG

Project O. M. E. Hole Number D - 9

Area Betty O'Neal Page 2 of 2

Depth	Rock Type, Structure		Alteration	Minerals	Analysis			
320'					Ag (oz./ ton)			
340'					Tr.			
360'					Tr.			
380'					0.02			
400'			Silicified	Quartz vein; Disseminated pyrite; Barite vein	0.26			
420'					4.22	400'-405',	19.90	
440'					0.02			
451'	T.D.			1% pyrite 10% pyrite	0.03			

DRILL HOLE ASSAY LOG

Hole No. D-9

Project O.M.E.
Coordinates 8,693 N
12,462 E
Elevation 6115
Victory Claim

Area Betty O'Neal
Inclination 90°
Bearing Vertical
Drill type Diamond

Page 1 of 1
Date started 4/21/66
Date stopped 5/19/66
Log by D.W.G.
Total Depth 451

Footage				%	Sample	Analysis					
From	To	Feet	Rec'y	Rec'y	No.	oz Au	oz Ag	% Cu			
0	20	20	Slge.				0.96				
20	40	20	Slge.				0.44				
40	60	20	Slge.				0.22				
60	80	20	+1.0	5			0.24				
80	100	20	1.0	5			0.02				
100	120	20	3.0	15			0.04				
120	140	20	6.0	30			0.02				
140	160	20	13.0	65			Tr				
160	180	20	15.0	75			0.05				
180	200	20	16.0	80			0.30				
200	220	20	12.0	60			0.02				
220	240	20	15.0	75			Tr				
240	260	20	16.0	80			Tr				
260	280	20	20.0	100			Tr				
280	300	20	13.0	65			Tr				
300	320	20	11.0	55			Tr				
320	340	20	7.0	35			Tr				
340	360	20	8.0	40			Tr				
360	380	20	11.0	55			0.02				
380	400	20	16.0	80			0.26				
400	420	20	20.0	100			4.22				
420	440	20	20.0	100			0.02				
440	451	20	20.0	100			Tr				
400	405	5	5.0	100			19.90				
405	410	5	5.0	100			Tr				
410	415	5	5.0	100			Tr				
415	420	5	5.0	100			0.03				

DRILL HOLE LOG

Hole No. E-1

Project O.M.E. Area Betty O'Neal Page 1 Of 2

Location: Depth 310 Inclination 90 Bearing Vertical

North 8,959 East 11,702 Elev. 5882

Logged by J.V.T. Date Started 6/27/66 Date Stopped 8/1/66

Footage From	Footage To	Footage Feet	Footage Rec'y	% Rec'y	Description	Sample Number	From	To
39	77	38			Moderately kaolinized quartz poprhyry, Feox stained, slightly limey, crushed gray-green shale at 55-56, spotty Mn staining		( )	( )
77	119	42			Fault zone at 77', then crushed gray shale, moderately Feox stained, minor quartz and calcite veining		( )	( )
119	146	27			Pale greenish white siliceous quartz porphyry, sparse subhedral, clear quartz "eyes", Feox and dendritic Mn staining along frac. surfaces		( )	( )
146	147	1			Crushed zone, heavy Mn staining, white talc		( )	( )
147	200	53			Medium grained, vitreous quartzite, then gray fine grained silicified shale, cinn. brown limonite on parting surfaces, rock grades into dark grey-black fine grained silicified quartzite at 153', some Feox staining and calcite veining shaley in spots, fault zone, 174-175'		( )	( )
200	213				Crushed zone, poor core recovery, rock grey silic. chert with dissem. pyrite and clear silica veining		( )	( )
213	231	18			Poor recovery, hard silicified gray chert w/ dissem. pyrite, black shale partings.		( )	( )
231	256	25			Fault zone, fragments of core show rubble composed of black shale, chert, some fragments high in pyrite, matrix gray-green clay.		( )	( )

DRILL HOLE LOG

Project Q.M.E. Area Betty O'Neal Hole No. E-1

Location: Depth ( ) ( ) ( ) ( ) ( ) ( ) Page 2 Of 2

North Inclination From To

East Bearing

Elev. Logged by Date Started Date Stopped

Footage				% Rec'y	Description	Sample Number
From	To	Feet	Rec'y			
256	266	10			Black carbonaceous shale, pyrite coating parting surfaces, rock contorted and crushed.	
266	278	12			Gray and gray-black chert, highly broken, 270-278 section is veined with ½" to ¼" milky white quartz-barite veinlets, section at 278' contains segregations of pyrite, some blue- white quartz.	
278	279	1			Sugary white quartz-calcite vein in crushed grey chert, minor pyrite.	
279	310	31			Dense gray-white chert, veined with silica and minor pyrite, 3" white barite vein at 295', ¼" barite veinlets at 80° with core at 304-306.	
					END OF HOLE	

GRAPHIC DRILL LOG

Project O. M. E.

Hole Number E - 1

Area Betty O'Neal

Page 1 of 1

Depth	Rock Type, Structure	Alteration	Minerals	Analysis
Surface				Ag (oz./ton)
20'	No record			0.03
40'				Tr.
60'		Mod. kaolinized		Tr.
80'			Minor calcite	Tr.
100'				Tr.
120'				Tr.
140'				Tr.
160'			Fe. staining	Tr.
180'		Silicified		Tr.
200'			Disem. pyrite	Tr.
220'				Tr.
240'			Calcite veining	Tr.
260'				0.02
280'			Barite veining QTZ.-barite veining	0.36
295'				0.04
300'				
310'	T.D.			0.12

DRILL HOLE ASSAY LOG

Hole No. E-1

Project O.M.E.
Coordinates 8,959 N
11,702 E
Elevation 5882
Topsy Claim

Area Betty O'Neal
Inclination 90
Bearing Vertical
Drill type Diamond

Page 1 of 1
Date started 6/27/66
Date stopped 8/1/66
Log by D.W.G.
Total Depth 310

Footage				%	Sample	Analysis					
From	To	Feet	Rec'y	Rec'y	No.	oz Au	oz Ag	% Cu			
0	20	20	Slge.				0.03				
20	40	20	Slge.				Tr				
40	60	20	15.0	75			Tr				
60	80	20	12.0	60			Tr				
80	100	20	7.0	35			Tr				
100	120	20	6.0	30			Tr				
120	140	20	16.0	80			Tr				
140	160	20	14.0	70			Tr				
160	180	20	11.0	55			Tr				
180	200	20	8.0	40			Tr				
200	220	20	7.0	35			Tr				
220	240	20	3.0	15			Tr				
240	260	20	3.0	15			0.02				
260	280	20	18.0	90			0.36				
280	295	15	11.0	73			0.04				
295	310	15	13.0	87			0.12				
270	275	5	5.0	100			0.68				
275	280	5	5.0	100			0.90				

DRILL HOLE LOG

Project O.M.E. Area Betty O'Neal Hole No. K-1

Location: Depth 200 Page 1 Of 1

North 6,055 Inclination 90 From ( ) ( ) ( ) ( ) ( )

East 11,540 Bearing Vertical To

Elev. 6242 Logged by J.V.T. Date Started 7/15/66 Date Stopped 7/29/66

Footage From	Footage To	Footage Feet	Rec'y	% Rec'y	Description	Sample Number
50	114	64			50-58, no core; 58-72, Brecciated, bleached shale, 2-3 mm thick dull br. hematite frac. coatings, some Mn, barite veining at 71.5-72. 72-108, fault zone, gray gouge, rounded calcite fragments, shale and quartzite fragments, 108-114, gray-tan silic. limestone w/ calcite and barite veining.	
114	126	12			Same to 117, 3" white calcite vein then black vitreous quartzite grading into dense gray-white chert w/ minor dissem. pyrite.	
126	136	10			Gray-white chert	
136	145	9			Same	
145	154	9			Same, massive white barite vein at 148.5-149 at angle of 5 degrees w/ core, 1/8" to 1/4" barite veinlets continue to 154', from 149 to 154 rock black, very fine grained quartzite.	
154	163	9			Veining continues until 156, rock grades into gray and gray black chert, minor dissem. pyrite.	
163	172	9			Same.	
172	181	9			Same to 176, then silic limestone grading into limestone breccia, very hard and recemented, considerable black calcite and Mn staining, grades into tan-gray fine-grained sandy limestone at 179.	
181	200	19			Greenish-white silic. limey quartzite, changes to silic argillite at 186, minor veinlets of pyrite and milky quartz.	
					END OF HOLE	

GRAPHIC DRILL LOG

Project O. M. E.

Area Betty O'Neal

Hole Number K - 1

Page 1 of 1

Depth	Rock Type, Structure	Alteration	Minerals	Analysis
				Ag (oz./ton)
Surface				
20'	No record			0.08
40'				0.02
60'	Bleached Shale		Calcite veining; Barite veining	0.10
80'	Fault zone			0.06
100'				0.06
120'	Quartzite		Disem. pyrite	Tr. 0.05
140'	Chert	Silicified		0.05
160'	Quartzite		Barite veining	0.08
180'	Chert		Calcite veining	0.02
200'				0.02

DRILL HOLE ASSAY LOG

Hole No. K-1

Project O.M.E.
Coordinates 6,055 N
11,540 E
Elevation 6242
Kinkaid Claim

Area Betty O'Neal
Inclination 90°
Bearing Vertical
Drill type Diamond

Page 1 of 1
Date started 7/15/66
Date stopped 7/29/66
Log by D.W.G.
Total Depth 200

Footage				%	Sample	Analysis					
From	To	Feet	Rec'y	Rec'y	No.	oz Au	oz Ag	% Cu			
0	20	20	Slge.				0.08				
20	40	20	Slge.				0.02				
40	60	20	Slge.				0.10				
60	80	20	6.0	30			0.06				
80	100	20	1.0	5			0.06				
100	120	20	6.0	30			0.05				
120	140	20	18.0	90			0.05				
140	160	20	20.0	100			0.08				
160	180	20	20.0	100			0.02				
180	200	20	20.0	100			0.02				
108	114	6	3.0	50			Tr				

DRILL HOLE LOG

Project O.M.E. Area Betty O'Neal Hole No. K-2

Location: North 6,043 East 11,344 Elev. 6197

Depth 293 Inclination 90° Bearing Vertical

Logged by J.V.T. Date Started 8/2/66 Date Stopped 8/17/66

Page 1 Of 1

Footage				% Rec'y	Description	Sample Number
From	To	Feet	Rec'y			
15	57	42			Dense gray-white chert, Feox stained.	
57	83	26			Feox stained pale green-white quartz porphyry,	
					sparse vitreous subhedral quartz eyes, slightly	
					limey, minor dissem. pyrite.	
83	85	2			Fault zone, crushed porphyry, shale and chert,	
					green-white talc on shear surfaces, clear	
					gypsum cemsnt.	
85	142	57			Gray-green, maroon-gray, and gray shale, some	
					gray chert, green talc and minor pyrite on	
					parting surfaces, minor dissem. pyrite.	
142	175	33			Bleached, sugary-textured rock, soft, fine grained	
					rock, some dissem. pyrite, trace chalcopyrite,	
					white talc along shear surfaces, rock originally	
					shale and sandy shale.	
175	177	2			Fault zone, gray rounded fragments, some quartz-	
					calcite vein material.	
177	185	8			Crushed zone, bleached, crushed shale, barite	
					fragments 179-185,	
185	209	24			Even textured, fine-grained, bleached rock,	
					spots of pyrite, sparse clear , subhedral	
					quartz, rock altered porphyry,	
209	293	84			Dense green-brown silic. quartzite, grading	
					into mottled gray-black chert with silica and	
					pyrite veinlets, , rock then alternates between	
					black silic. quartzite and black carbonaceous shale	
					~~with minor silica veining and dissem. pyrite.~~	

END OF HOLE

GRAPHIC DRILL LOG

Project O. M. E. Hole Number K - 2

Area Betty O'Neal Page 1 of 1

Depth	Rock Type, Structure	Alteration	Minerals	Analysis
Surface				Ag (oz./ ton)
20'	Chert		Limonite	--
40'				Tr.
60'	Quartz porphyry		Dissem. Pyrite	Tr.
80'				Tr.
	Fault			
100'	Shale, some chert		Dissem. pyrite	0.02
120'				Tr.
140'		Bleached	Barite Gag.	Tr.
160'				Tr.
	Fault			
180'	Quartz porphyry	Bleached Kaolinized	Calcite Quartz	0.05 0.05
200'				Tr.
220'	Shale + quartzite	Silicified	Dissem. pyrite	Tr.
240'				Tr.
260'		Silicified		Tr.
280'				Tr.
300'	T.D. 300'			Tr.

DRILL HOLE ASSAY LOG

Hole No. K-2

Project O.M.E.
Area Betty O'Neal
Page 1 of 1
Coordinates 6,043 N
11,344 E
Inclination 90°
Date started 8/2/66
Bearing Vertical
Date stopped 8/17/66
Elevation 6197
Drill type Diamond
Log by D.W.G.
Yankey Claim
Total Depth 300

Footage				%	Sample	Analysis					
From	To	Feet	Rec'y	Rec'y	No.	oz Au	oz Ag	% Cu			
20	40	20	2.0	10			Tr				
40	60	20	3.0	15			Tr				
60	80	20	13.0	65			Tr				
80	100	20	11.0	55			0.02				
100	120	20	20.0	100			Tr				
120	140	20	18.0	90			Tr				
140	160	20	9.0	45			Tr				
160	180	20	19.0	95			0.05				
180	200	20	19.0	95			Tr				
200	220	20	20.0	100			Tr				
220	240	20	20.0	100			Tr				
240	260	20	20.0	100			Tr				
260	280	20	20.0	100			Tr				
280	300	20	20.0	100			Tr				
180	185	5	5.0	100			0.05				