



## **CONTACT INFORMATION**

Mining Records Curator  
Arizona Geological Survey  
1520 West Adams St.  
Phoenix, AZ 85007  
602-771-1601  
<http://www.azgs.az.gov>  
[inquiries@azgs.az.gov](mailto:inquiries@azgs.az.gov)

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ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES AZMILS DATA

PRIMARY NAME: HUMMINGBIRD GROUP

ALTERNATE NAMES:  
BLANDELL  
VIRGIN MTS

MOHAVE COUNTY MILS NUMBER: 251A

LOCATION: TOWNSHIP 38 N RANGE 16 W SECTION 27 QUARTER NW  
LATITUDE: N 36DEG 39MIN 53SEC LONGITUDE: W 114DEG 01MIN 46SEC  
TOPO MAP NAME: VIRGIN PEAK - 15 MIN

CURRENT STATUS: EXP PROSPECT

COMMODITY:  
BERYLLIUM  
FELDSPAR  
MERCURY  
KYANITE  
RARE EARTHS

BIBLIOGRAPHY:  
OLSON, J.C. "BERYL-BEARING PEGMATITES IN RUBY  
MTNS & OTHER AREAS IN NV, NW AZ" USGS BULL  
1082-D, P. 189-192; 1960  
MEEVES, H.C. "RECONN. OF BERYL-BEARING PEGMAT  
ITES IN 6 WSTRN STATES" USBM IC 8298, P 20  
ADMMR AZ. INDUSTRIAL MINERALS, RPT #2, P 43-4  
ADMMR HUMMINGBIRD GROUP FILE  
AZBM BULL. 180, P. 107



June 7, 1990

Mr. Ken Phillips  
Arizona Department of Mines &  
Mineral Resources  
Mineral Building Fairgrounds  
Phoenix, AZ 85007

RE: Rare Earth Deposits - Mohave County, Arizona

Dear Ken:

Sorry for the delay in forwarding the assay reports, etc., for the referenced project. We had anticipated a personal visit and, therefore, waited to mail the items. We still hope to be in Arizona in the near future, but would like you to review the enclosed package at your earliest convenience.

I'll call next week to review the matter.

Sincerely,

G. P. Dorward, CCIM

*Graig Dorward*

GPD/bm

Wade Conley - 455-8923  
404  
Home 404-945-8435

Enclosure



STATE OF ARIZONA

## DEPARTMENT OF MINES AND MINERAL RESOURCES

Mineral Building • State Fairgrounds • Phoenix, Arizona 85007

(602) 255-3791

To: Wade Conley  
From: Ken A. Phillips, Chief Engineer  
Subject: **Suggestions for further prospecting of Blandsell Claims**

The following are suggestions for work on your claim group.

1.  
Defer plans for drilling until you have obtained additional information on the mode of occurrence of the rare earth mineralization.
2.  
Visit the property in my company in early August.  
(less than \$400)
3.  
Depending on favorable comments from above visit hire an experienced pegmatite geologist to determine probable patterns of zoning of rare earth mineralization.
4.  
Continue with above geologist to trench surface samples for determination of mineral distribution, grade and type.
5.  
If results of above are encouraging, drill a limited number of diamond core holes to obtain information as to possible extent and mineral distribution at depth.
6.  
Based on above results either promote and sell property or abandon.

Trip to Arizona, week of 8-10-90

Discussion points with Ken Phillips, Chief Engineer, Arizona Department of Mines:

- 1) Mineralization of rock that rare earth is in:  
Ken said that there are six possibilities as to the type of rock, three are capable of rare earths to be extracted from, the other three types our current technology does not permit separating the rare earths. Before any further exploration or sales efforts are made, he suggested we need to answer this question as to the type of rock. (*minerals*),
- 2) 72 Report:  
Ken explained what concentrates are. By using a table shaker, lower parts per million can be combined or concentrated up to grade ore numbers. 72 report does not indicate sampling at the values or percentages shown. It does show that the rare earths have been concentrated up to the percentages shown.
- 3) Dr. Hutchinson's previous work on this property:  
Ken Phillips feels that Dr. Hutchinson's work on this property has been excellent to date. After reviewing Dr. Hutchinson's initial report, Mr. Phillips agrees that the following need to be addressed in order:
  - a) Rock mineralization - to find out if the rare earths can be separated.
  - b) Trenching - going down into the seam to take samples. It is important to get consistent values from these samples.
  - c) Take more samples to support mapping that Hutchinson has done.
  - d) Series of ~~care~~ *core* drilling ~~trying~~ *determine size of deposit and* to locate pockets.

At each step above, a positive answer needs to be ascertained before moving to the next step. Mr. Phillips, with this in mind, put the chances at 100 to 1 on this project.

- 4) Mr. Phillips will supply us with names of people qualified to trench.
- 5) Mr. Phillips will supply their directory for development mining companies looking for properties to work.
- 6) Without further exploration work done by us, Mr. Phillips suggested that a viable option would be to turn over to a exploration company to finish a-d under #3. With others taking the risk he suggested that if we could sell for \$200,000 - we should think about taking it.
- 7) Mr. Phillips is the only impartial person we have talked to on this project. His views should be paid attention to as realistic.

404-455-1847

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## EXECUTIVE STATEMENT

According to existing records for the period from the late 1940s to the present, there has been intermittent interest and exploration for rare earths in the Blandsell Claims area, especially in Claims Nos. 2, 3, 4, 5.

American Smelting and Refining Company (ASARCO) sank a shaft  $\pm$  80 feet on a suspected REO vein structure which was abandoned for some unknown reason. On the Blandsell property are two shallow shafts, one  $\pm$  85 feet, one collapsed adit and several surface cuts in the working area. Workings other than the  $\pm$  85 foot shaft may or may not be attributable to ASARCO. Several old access roads, dozer cuts and drill pads attest to past exploratory work. Notable at prospect pit No. 1 is a rectangular excavation in chloritic schist injected by granite pegmatite which yielded about 25 to 30 tons of rock.

On January 10, 1972, National Lead Industries, Inc. (N.L., Inc.) had a series of geochemical assays run for rare earth metals by FLUO-X-SPEC Labs, Inc. of Denver. Sample material on the Analytical Sheets were labeled as Table Concentrates, Table Middlings, and Heavy Minerals. It is quite probable these three concentrates came from Pit No. 1 and were prepared by crushing and then run over a Wilfley Jig Gravity Separation Table. L.R. Condie also had samples run by the same FLUO-X-SPEC lab on April 27, 1972.

There is no way to determine for certain how many pounds or tons of chloritic rock were concentrated and analyzed. In talking to Merlyn Salmon, whom I know personally and who has done thousands of dollars of analytical work for me in the late 1960s and early 1970s, he could not recall or had a statement of how many samples he analyzed for N.L. Industries, Inc. and L. R. Condie. Rare earth metal content of N.L. Industries, Inc. samples were much better than average (see Tables 7A, 7B, 7C) and those of L.R. Condie were lower than average (see table 7D).

James L. Renshaw mapped the areal geology and sampled exposed rock units in the Blandsell Claims Nos. 2, 3, 4, 5 and additional sites to the southeast, east and northeast. His report was completed October 10, 1989.

Robert M. Hutchinson completed mapping and sampling of the 2500 foot distance between the ASARCO shaft - Prospect Pits Nos. 1, 2, 3 - Adit area and as far southwest as about 500 feet beyond the west side of Blandsell Claim No. 5. Results of his work are the subject of this report.

Rare earth metal values obtained by National Lead Industries, Inc. (N.L., Inc.) analysis of table concentrates and heavy minerals is above average for La, Ce, Nd and Y (see tables 7A, 7B, and 7C). The prospect pit from which the chloritic rock was most probably taken is equivalent to about 25 to 30 tons when removed; i.e., about 300 to 360 cubic feet. There is no telling how much of the removal material was used by either N.L., Inc. or L.R. Condie. Condie's metal assays for La, Ce, Nd, and Y are of the average range. Renshaw's values are below average, and Hutchinson's show average metal values for Ce, La, Y, Sn and Nd.

No proven ore reserves can be calculated due to the fact that only surface samples have so far been taken and assayed. A distance of 1500 feet of ground between the ASARCO shaft and the prospect pits, Adit 1, has not been prospected or sampled. An additional 1000 feet southwest from the adit-pits area has not been prospected or sampled, but samples BL-13 to BL-16 at the extreme southwest corner of this 1000-foot distance show minimal rare earth metal values.

At this point in time, Sub Rosa, Inc. has the choice of three different lines of procedures. These are: (1) Offer the property included by Blandsell Claims Nos. 2, 3, 4, 5 for lease with an option to buy to any interested mining company or exploration group; (2) carry out some additional exploration and sampling throughout claims Nos. 2, 3, 4, 5 by digging 5 to 10 trenches up to 6 feet or 10 feet deep, if at all possible, and 100 to 200 feet in length along the 2500



feet of the northeast-trending rock units of chloritic rock, pegmatites and granite gneiss wall rock; and (3) depending on the outcome of the additional exploration and sampling in item (2) above, Sub Rosa, Inc. could approach mining companies and/or interested exploration groups to take out or lease with an option to buy after a period of additional exploration and/or diamond drilling on their part and at their discretion and expense.

It would premature, at this point in time, to write off the Blandsell Claims Nos. 2, 3, 4, 5 area as having no worthwhile economic potential. In view of the fairly wide variation and range in the rare earth metal values obtained from investigations from January 1972 up to now, Sub Rosa, Inc. might consider one last final step before abandoning the project. This step would consist of that outlined in item (2) above, as well as having additional and final geological inspection of the rest of the acreage included in all the Blandsell claims to the east, northeast and northwest.

These are difficult decisions to face up to, especially when known mineralization is not on the high value side and subsurface exploration needs to be done, which will cost additional money with no guarantee of increasing the economic potential of the project. However, this is one of the hard and cruel facts that face those ambitious ones who seek to go further and even again further to finalize the degree of worth of a deposit. Patience, careful explorational planning, judicious use of exploration money, and knowing when to stop or go ahead are key factors or, so to speak, the bottomline for any explorational project with limited financial resources available by the interested persons involved in the venture.

## COLLECTION OF SAMPLES FOR ANALYSIS

Rock material for geochemical analysis was collected in the field with the assistance of John Heidt. Two different methods of sampling were used as the occasion demanded; i.e., (1) cutting or chip-channel 2"-3" wide and 2"-3" deep into solid rock with steel chisel and 2 pound rock hammer; and (2) selecting and collecting grab samples of loose rock chunks lying on a mine dump next to the excavation or shaft. Twenty-one individual heavy canvas sample bags were filled, giving a total of 456 pounds of broken rock sample material for geochemical analysis. Individual filled sample bags weight varied from 15 to about 25 pounds each. Twenty geochemical analyses were made from these twenty-one collecting bags. The list of sample bags follows below. Plate 1 and Figures 1 and 2 provide locations of the sampling sites.

BL- 1  
 BL- 2  
 BL- 3A) NOTE: These two samples should be combined  
 BL- 3B) into a single sample for analysis.  
 BL- 3C  
 BL- 3D  
 BL- 4  
 BL- 5  
 BL- 6  
 BL- 7  
 BL- 8        Total of 20 samples for analysis.  
 BL- 9  
 BL-10  
 BL-11  
 BL-12  
 BL-13  
 BL-14  
 BL-15  
 BL-16  
 BL-17  
 BL-18

Analyses completed are (1) fire assays for gold and silver, (2) the rare earths Ce, La, Y by XRF (X-ray spectrographic fluorescence), and (3) all 14 rare earths plus

Sc, Th, and U; i.e., Ce, Eu, La, Pr, Tb, Yb, Dy, Gd, Lu, Sm, Er, Ho, Nd, Tm (see Tables 1, 2, 3).

#### MINERAL SOURCES AND RARE EARTHS CURRENTLY IN DEMAND

Current demand for Rare Earth metals is centered on Sm, Nd, Y, Ce and La. Source minerals for these metals are chiefly Bastnaesite, Monazite and Xenotime.

##### Bastnaesite [(Ce, La)(CO<sub>3</sub>)F]

**Chem.** A fluo-carbonate of the cerium group of rare earths (Ce, La, Di)(CO<sub>3</sub>)F.

##### **Analyses**

Ce <sub>2</sub> O <sub>3</sub>	37.55	37.71	40.50}	75.84
(La, Di) <sub>2</sub> O <sub>3</sub>	37.27	36.29	36.30}	19.55
CO <sub>2</sub>	20.15	20.03	20.20	19.55
F	8.69	7.83	6.23	2.24
H <sub>2</sub> O		0.08		1.83
Rem.		0.40	0.60	1.57
	103.66	102.34	103.83	101.03
O - F	3.66	3.30	2.61	0.95
Total	100.00	99.04	101.22	100.08
G.		5.12	4.948	4.746

##### Monazite [(Ce, La, Y, Th)(PO<sub>4</sub>)]

**Chem.** A phosphate essentially of the cerium metals, (Ce,La)-(PO<sub>4</sub>). The La earths consist principally of La and ordinarily are present in about a 1:1 ratio with Ce. Th is usually present in substitution for (Ce,La). The amount of Th present ordinarily ranges from a few weight percent ThO<sub>2</sub> to 10 or 12 percent, but a series probably extends up to at least 30 percent ThO<sub>2</sub>; thorium-free material is rare. The Y earths substitute in small amounts for (Ce,La) together with

to several percent, presumably in substitution for (PO<sub>4</sub>) but in some instances at least due to admixed zircon.

### Analyses

(Y,Er) <sub>2</sub> O <sub>3</sub>	61.40	67.78	56.81	51.82	64.97	63.25
La <sub>2</sub> O <sub>3</sub>			0.93	2.14		
Al <sub>2</sub> O <sub>3</sub>			0.77	4.80		
Fe <sub>2</sub> O <sub>3</sub>			0.65		0.09	
ThO <sub>2</sub>			tr.	2.47		
UO <sub>2</sub>			4.13	3.17		
ZrO <sub>2</sub>			1.95	1.90		
SiO <sub>2</sub>			3.46	4.32	0.57	
P <sub>2</sub> O <sub>5</sub>	38.60	32.11	30.31	25.38	33.42	35.99
Rem.		0.18	0.84	3.65	0.83	0.63
<hr/>						
Total	100.00	100.07	99.85	99.65	99.88	99.87
G.		5.106	4.68	4.46	4.577	

### RARE EARTH-BEARING MINERALS IN THE BLANSELL MINING COMPANY CLAIMS Nos. 2, 3, 4, 5 AREA

At the present time, no attempt at identification has been made of any rare earth-bearing mineral or minerals that might be present; i.e., Bastnaesite, monazite, or xenotime. Microscopic analysis has not indicated any of these minerals to be present. However, only X-ray diffraction patterns of the powdered rock material would supply this information.

### GOLD, SILVER AND RARE EARTH ELEMENT OCCURRENCES IN SAMPLE NUMBERS BL-1 to BL-18

Table 4 gives the list of samples collected, their location and proximate weight collected. Table 5 provides the equivalent amounts present in ppm and weight %.

## GOLD AND SILVER

Gold and silver values were insignificant throughout the area investigated. Gold values were all  $<0.002$  oz/ton and silver values were less than 0.02 oz/per ton. There is no indication of any economically valuable amounts (see Table 1).

Rare Earth Metals Ce, La, Y, Sm, Nd

Comments on the rare earth metal content of the eighteen samples analyzed are directed toward those metals currently in most demand; i.e, Ce, La, Y, Sm, Nd.

Samples BL-1 and BL-2: Two bags of samples were collected from loose chunks and pieces of a greenish gray rock scattered on top of a dump from a prospect pit on the north boundary of Blandsell Claim No. 13. Hand specimen examination indicated the possible presence of the mineral fluorite which is commonly yttrium-bearing. However, microscopic analysis indicated absence of any fluorite and only the presence of metamorphic minerals tremolite and a pyroxene (diopside?) with spinel ( $MgAl_2O_4$ ) and dolomite  $CaMg(CO_3)_2$  (see Figures 9). The prospect pit is in thinly banded biotite-quartz-feldspar gneiss which is in no way similar to the gray-greenish metamorphic rock spread on top of the dump. For some reason the tremolite-diopside-spinel rock must have been hauled in and dumped at the Prospect Pit. As seen from the geochemical analyses, the ppm for Ce, La, Y, Sm and Nd for BL-1 are 40, 32, 22, 3.30, and 16; for BL-2 are  $<5$ , 20, 17, 1.5 and 8. These are insignificant metal values. The low yttrium content attests to the absence of fluorite.

## Prospect Pits - Adit Area

Pit No. 1 - Five samples were collected at Pit No. 1; i.e., BL-3A + BL-3B, BL-3C, BL-3D, BL-4 and BL-17 (see Figure 1 and Tables 4 and 6). The highest value of Y (1300 ppm) is in the 3-foot pegmatite sample, Sample BL-3C, while values in the chlorite unit varied 58, 430, 765 to 830 ppm. Ce is 454 ppm in the pegmatite and varies 64, 315, 454, 496 to 619 ppm in chlorite unit. La is 185 in the pegmatite and varies 37, 116, 185, 223 to 241 in the chlorite unit. Sm and Nd are extremely variable and generally less than the other rare earth metals.

Pits No. 2 and 3 - To the northeast of Pit No. 1 in Pits 2 and 3.

The pegmatite dike shows a drop in values for Ce and La in Samples BL-6 and BL-7; i.e., 392 to 210 and 165 to 70 ppm, respectively. The chloritic unit also has lower values.

Adit Area - In the adit (tunnel) Ce and La show a very sharp drop in values to 60 and 65 for Ce and 28 ppm for La. Both the samples, BL-8 and BL-9, were cut in pegmatite and pegmatized granite gneiss.

ASARCO Shaft - Sample Nos. BL-10, BL-11 and BL-12 were collected from loose rock on the dump next to the ASARCO shaft (see Figure 2; Tables 4 and 6). All three samples were collected from the chloritic unit which was the only material on the mine dump. In contrast to sample BL-3C (pegmatite dike at Pit No.1), the chlorite rock at the ASARCO shaft had a high Y content of 1200 ppm for Sample BL-11. Other Y values varied 365 to 410 ppm. Ce varied 324, 362 to 753 and La is 134, 161 to 317 ppm. Nd ranged slightly greater; 170, 200 to 300 ppm than Pits 1, 2, 3 and the Adit.

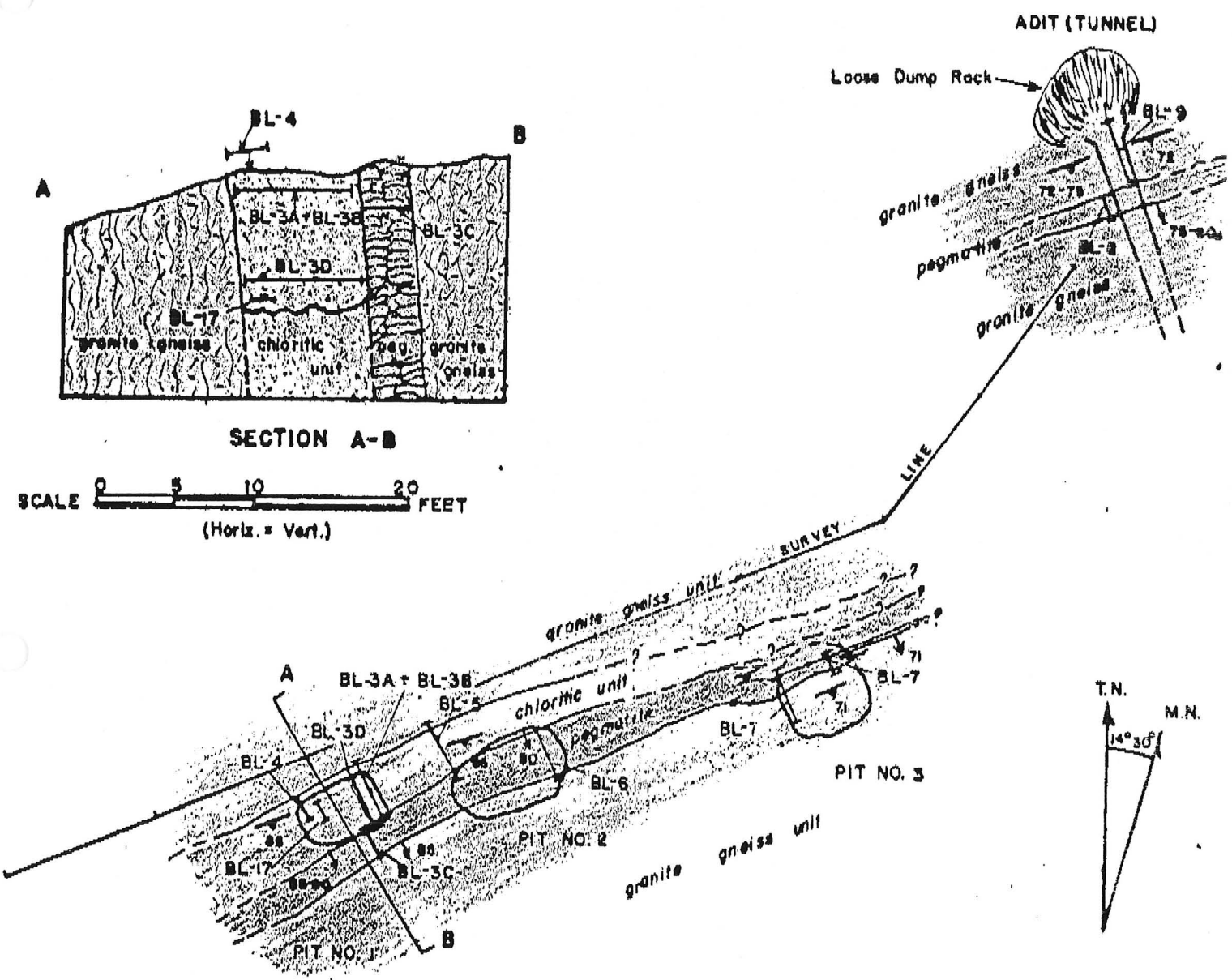
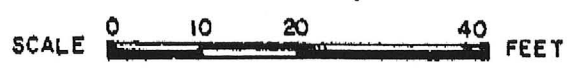


FIGURE 1 - GEOLOGY AND LOCATIONS OF CHIP-CHANNEL SAMPLES AT THE ADIT AND PROSPECT PITS



11/11-14/89  
Geology and Sampling by Robt. M. Hutchinson

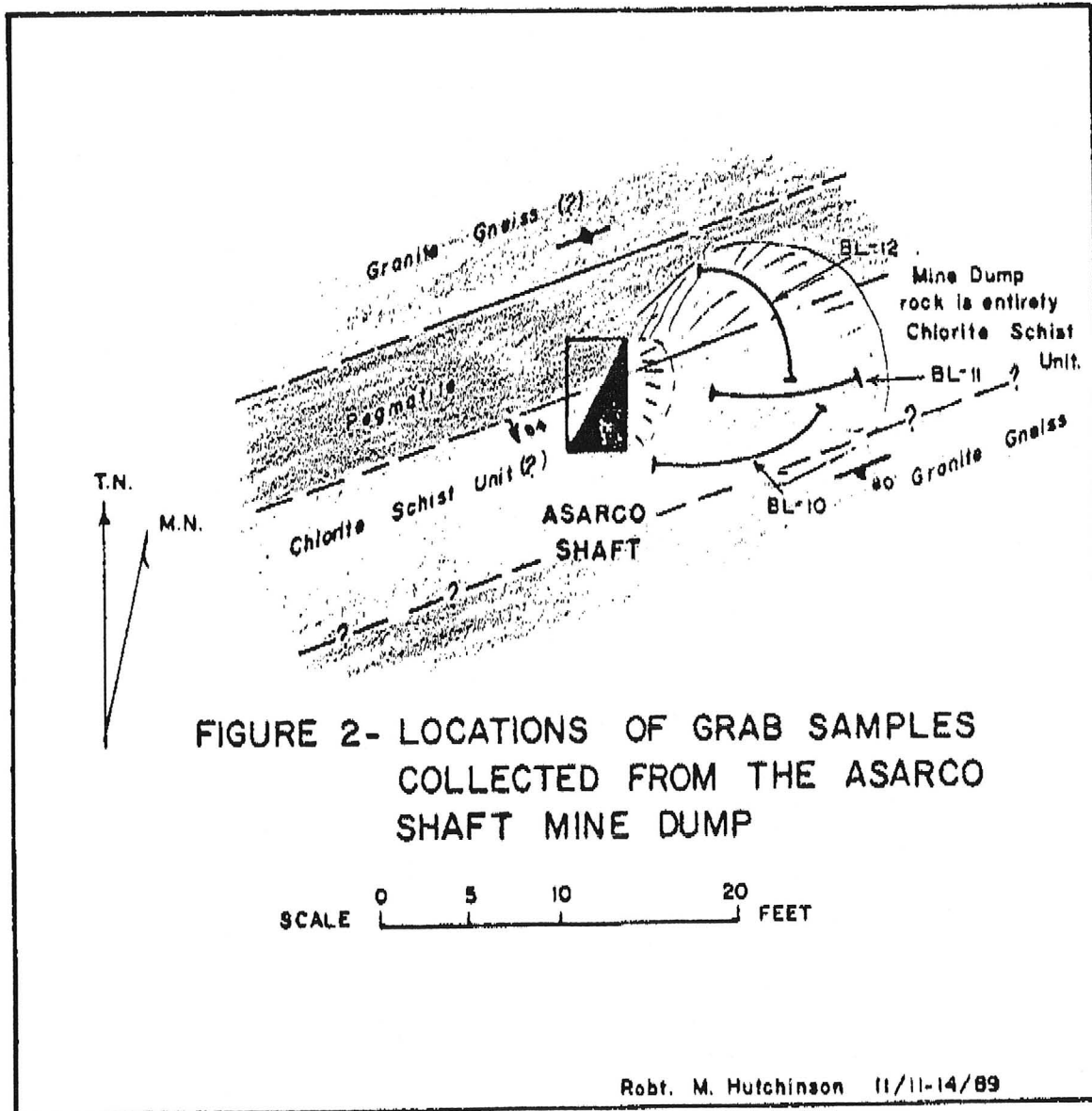


FIGURE 2- LOCATIONS OF GRAB SAMPLES COLLECTED FROM THE ASARCO SHAFT MINE DUMP

Robt. M. Hutchinson 11/11-14/89



Southwest Corner of Blandsell Claim No. 5

Traversing to the southwest part of the area sampled in the southwest corner of Blandsell Claim No. 5, four samples were collected; BL-13, BL-14, BL-15 and BL-16 (see Plate 1 and Table 4).

	Ce	La	Y	Sm	Nd	
BL-13	{21-61 {50	{33.1-34 {35	15	6.47	36	
BL-14	{19-13 {7	{8.6-11 {13	<5	1.90	13	Pegmatite
BL-15	{97-86 {74	{42.9-50 {57	<5	9.05	50	
BL-16	{<7-<6 {<5	{3.1-5 {7	<5	0.75	5	Pegmatite

Samples BL-14 and BL-16 were cut across narrow pegmatite dikes and show minimal rare earth metal values. The same holds true for samples BL-13 and BL-15 cut in biotite-quartz-feldspar gneiss and a slightly chloritic unit.

Sample BL-18 was collected from loose chunks of white, coarse grained tourmaline-bearing granite pegmatite, both in the stream bed at the Adit and piled on the road in the southeast corner of Blandsell Claim No. 4 (see Plate 4 and Figure 10 ). There were no significant metal values in this rock.

## SIGNIFICANCE OF DISTRIBUTION OF RARE EARTH METALS

Concentration of higher rare earth metal values at the ASARCO shaft and the prospect pits area would seem to indicate these two locations to be the best sites for further exploration and sampling. However, it should be pointed out that there is a distance of about 1500 feet between the ASARCO shaft and the prospect pits area that has not been sampled (see Plate 1). Another item of importance, and this applies for the entire distance of about 2500 feet between samples BL-13 to BL-14 northeast to the ASARCO shaft area, is the spatial relationship of the chloritic rock unit to the pegmatite rock unit. This needs to be determined more exactly than has been to date.

Between sample BL-13 and the prospect pits, the chloritic unit is on the northwest side of the pegmatite. But, between the adit and ASARCO shaft portion of the chloritic unit relative to the pegmatite is not known. At the ASARCO shaft there is no exact relation (contact) visible between the pegmatite and the chloritic unit. As can be seen in Plate 1 and Figure 2, especially Figure 2, the mine dump is nothing but chloritic rock. there is no way of determining from which side of the pegmatite, at the bottom of the shaft, the chloritic rock was taken; i.e., the northwest or the southeast side of the pegmatite. This should be determined at depth and sampled if at all possible.

According to a report by Joseph Owens, August 11, 1989, entitled "Staking Report, Comments and Recommendations," page 2, he states that he visited the property in June 1973 for LeRoy Condie. Condie told Owens that ASARCO sank the shaft approximately 85 feet on a suspected REO vein structure. Condie stated that this work was performed in the late 1940s and ASARCO's reason for abandoning the project was unknown to him. Workings other than the  $\pm$  85 foot shaft may or may not be attributable to ASARCO.

AUG- 9-98 THU 12:09 AMISE P. 13

Of particular interest, at this juncture, is the fact that qualitative and semi-quantitative Fluorescent X-ray Spectrographic analysis was done by National Lead Industries, Inc. and also by L.R. Condie. Assay reports of N.L. Industries are dated January 10, 1972 and those for L.R. Condie April 27, 1972, which is three months after N.L. Industries' work.

The analytical work was done by FLUO-X-SPEC Analytical Laboratory, 718 Sherman Street, Denver, Colorado 80203. I personally know the analyst who did the analytical work, Merlyn Salmon, for he did several thousand of dollars of work for me in 1968-1969. When I talked with Mr. Salmon, he could not recall what quantity of material was sent him by N.L. Industries and L. R. Condie. However, based on the identification on the Analytical Report Sheets, the N.L. Industries material analyzed was identified as "TABLE CONC," "TABLE MIDS," and "HEAVY MINERALS." These mean Jig Table Concentrates, Jig Table Middlings, and Jig Table Heavy Mineral Concentrates (see included FLUO-X-SPEC Analytical Report Sheets. L.R. Condie's Analytical Report Sheet is not labeled.)

The evidence would seem to suggest that both N.L. Industries, Inc. and L.R. Condie obtained from the ASARCO shaft chloritic rock and also perhaps from the excavation at Pit No. 1. It appears that about 25-30 tons of chloritic rock were excavated from Pit No. 1, but there is no way of telling how much, if any, chloritic rock was analyzed from the chloritic rock at the base of the ASARCO shaft.

Rare earth metal values for Table Conc., Table Mids, and Heavy Minerals by N.L. Industries, Inc. assay reports are high. Metal values are reported as "estimated percentages," and if converted to ppm using Table 5 of this report, there would seem to be reason to explore and sample the area more completely. L.R. Condie's metal values are also encouraging, although there is no way of knowing what type of material he submitted for analysis.

## ORE RESERVES

Before discussing the item of possible ore reserves for the Blandsell Claims Nos. 2, 3, 4, and 5, it is instructive to review the prerequisite conditions to properly defining and classifying an "ore body" as such. The classification terminology used by U.S. governmental agencies is as follows:

*Measured Ore.* Is ore for which tonnage is computed from dimensions revealed in outcrops, trenches, workings, and drill holes and for which the grade is computed from the results of detailed sampling. The sites for inspection, sampling, and measurement are so closely spaced and the geologic character is so well defined that the size, shape, and mineral content are well established. The computed tonnage and grade are judged to be accurate within limits which are stated, and no such limit is judged to differ from the computed tonnage or grade by more than 20 percent.

*Indicated Ore.* Is ore for which tonnage and grade are computed partly from specific measurements, samples, or production data and partly from projection for a reasonable distance on geologic evidence. The sites available for inspection, measurement, and sampling are too widely or otherwise inappropriately spaced to outline the ore completely or to establish its grade throughout.

*Inferred Ore.* Is ore for which quantitative estimates are based largely on broad knowledge of the geologic character of the deposit and for which there are few, if any, samples or measurements. The estimates are based on an assumed continuity or repetition for which there is geologic evidence; this evidence may include comparison with deposits of similar type. Bodies that are completely concealed may be included if there is specific geologic evidence of their

presence. Estimates of inferred ore should include a statement of the special limits within which the inferred ore may lie.

In commercial mining geology, which is guided primarily by direct economic factors, we find that ore reserves are often classified into the following units: *developed ore, probable ore, and possible and/or extension ore.*

The fundamental meaning of the term "ore" must necessarily be kept in mind. Classifying a mineral deposit as "ore" implies it can mined "at a profit." Rare earth metals obtained at the ASARCO shaft and the prospect pits area are average to below average. The semi-quantitative rare earth metal values obtained by ASARCO and L.R. Condie are better than average and encouraging. The assays by N.L. Industries, Inc. and L.R. Condie appear to have been run on at least several tons of rock material concentrated on a Wilfley concentrating gravity jig table and could be more meaningful.

ORE RESERVES IN BLANDSELL CLAIMS NO. 2, 3, 4, 5

However, because of the lack of information on metal values for the 1500 feet between the ASARCO shaft and the prospect pits and the localized surface sampling done so far without any trenching, underground workings sampling, and diamond drill holes, no grade of ore can be computed for this 1500 foot distance. At best, we can classify any and all material as "Inferred Ore" or "Possible and/or Extension Ore." This latter category has yet to be proved by additional exploration and sampling at depth.

RECOMMENDATIONS

Prior to declaring the rare earth mineralization occurring on the Blandsell Claims Nos. 2, 3, 4, and 5 as having no economic potential, it is recommended that serious

thought be given to cutting a series of 5 to 10 trenches perpendicular to and across the trend of the pegmatite and chloritic rock units shown in Plate 1. Trenches could be most probably about 100-200 feet in length and run up to 6 feet or more in depth, if possible. A backhoe could be used to do this excavating. Detailed mapping and sampling of any exposed chloritic rock and pegmatite should then be done. Should promising rare earth metal assays occur, then a decision must be made as to whether to (1) offer the property on lease with an option to buy or (2) plan a drilling program to depth and carry it out to completion.

At the present time, this rare earth deposit needs to be explored further, both on the surface or at depth as far as economically feasible. This decision has to be made by Sub Rosa, Inc., one way or the other. It would be informative if an estimate could be obtained from a local contractor what the cost would be to backhoe 5 to 10 trenches 6 to 10 feet deep and several hundred feet in length. It is possible that bedrock close to the surface will prevent deep excavation.

DISCUSSIONS WITH JOHN LANDRETH  
GENERAL MANAGER OF EXPLORATION FOR MOLYCORP.  
1201 WEST 5TH STREET  
LOS ANGELES, CALIFORNIA 90017

It was thought advisable to obtain as accurate a picture as possible of the industrial demand and market for the rare earth metals. For this reason, I talked to John Landreth and asked for his advice and guidance when evaluating the potential value of a rare earth metal deposit. Mr. Landreth was very candid and offered the following remarks:

- (1) At the present, there is considerable lack of knowledge on the part of industry and mining companies regarding mining and worth of rare earth metals deposits.

- (2) Greatest expense in the exploration, mining and metallurgical refining of rare earth metals is not in the exploration and mining, but in the chemical plant refining and marketing.
- (3) The world's rare earth refining technology is presently designed for only two different types of ore; i.e., Bestnaesite ores produce tailings that are "non-toxic" while the monazite ores do produce tailings waste that is toxic and radioactive. This latter produces a severe problem in toxic waste disposal for the monazite ores.
- (4) Demand for Samarium has recently dropped and is being replaced by Neodymium.
- (5) The Mountain Pass deposit of rare earths is a "world class" deposit and really cannot be compared with other domestic deposits. Average rare earth metal ore grade is currently 9% (90,000 ppm). Cutoff is 5% (50,000 ppm), and stockpiled material is greater than 2% (20,000 ppm). Their waste tailings have about 25% barite. Should the barite be removed, this would increase the total ore grade in rare earths of the tailings waste material.
- (6) The Mountain Pass deposit contains Y Ce, La and Europium and Praesodimium.
- (7) Molycorp does not buy rare earth concentrates for Y. They can get the mineral Xenotime from Indonesia and/or China which runs 60%  $Y_2O_3$ . Molycorp, Inc. is getting a concentrate from Poderico, Mexico from the mineral eudialyte which averages 0.18%  $Y_2O_3$ ; i.e., about 1800 ppm  $Y_2O_3$ .

#### ACKNOWLEDGEMENTS

I am indebted to Wade D. Conley, Jr., Chaiman and Charles M. Wilson, President, of Sub Rosa, Inc. for their continuing support. James Bland also offered and provided valuable information on the rare earths and their industrial usage. The surface sampling could not have been completed without the special help of John Heidt.

EXPLORATION PROGRAM TO DETERMINE EXTENT OF  
RARE EARTH MINERALIZATION ON THE BLANDSELL  
CLAIMS NOS. 2, 3, 4, 5  
NORTH VIRGIN MOUNTAINS AREA  
MOHAVE COUNTY, ARIZONA

#2 NE $\frac{1}{4}$ , Sec 28, 38 N 16 W  
#3 NE $\frac{1}{4}$ , Sec 28  
#4 NE $\frac{1}{4}$ , Sec 28  
#5 N  $\frac{1}{2}$  Sec 28

FOR

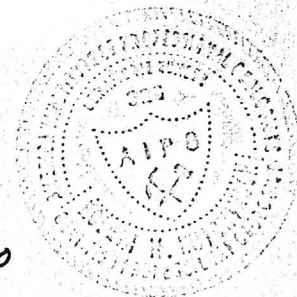
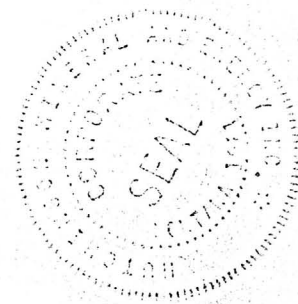
WADE D. CONLEY, JR., CHAIRMAN  
SUB ROSA, INC.  
4380 GEORGETOWN SQUARE II, SUITE 1016  
ATLANTA, GEORGIA 30338

by

Dr. Robert M. Hutchinson  
Consulting Geologist  
CPG 326  
Golden, Colorado 80401

March 25, 1990

*Robert M. Hutchinson* 3/28/90





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## INTRODUCTION

Rare earth mineralization on the Blandsell claims Nos. 2, 3, 4, 5 appears to be restricted to two parallel, contiguous rock units; i.e., (1) a chloritic schist partly injected by granite pegmatite, and (2) coarse grained granite pegmatite. Total width of the two rock units varies from 10 to 20 feet, which in some places is slightly less. Five of the fourteen rare earth elements most abundant are cesium, lanthanum, yttrium, samarium, and neodymium (Ce, La, Y, Sm, Nd). The structure is thought to continue for about 2500 feet in a general trend of N65°E (see Plate ).

Assays of samples collected at Prospect No. 1 and also ASARCO shaft show that Ce, La, Y, Sm and Nd occur in either or both of the two different rock units. The supposition geologically is that rare earth-bearing hydrothermal solutions originated from the granite pegmatite and migrated into the chloritic rock unit as the pegmatite intruded and partly replaced the chloritic unit.

An exploratory drilling project which will total approximately 10,000 to 12,000 linear feet is being proposed to determine the subsurface distribution and metal content of the two rock units. A drilling procedure is recommended using a tricone bit with reverse air circulation because of the amount of fracturing and intense faulting in the two rock units. A granite gneiss unit occurs on both sides of the schist and pegmatite and even this gneissic unit is well sheared and broken.

## RARE EARTH MINERALIZATION

In a previous report of March 1, 1990 surface samples collected by R.M. Hutchinson showed the rare earth mineralization apparently concentrated about two locations; i.e., the ASARCO shaft and the Adit-Prospect Pits Nos. 1, 2, 3 area (see

Hutchinson's report entitled "Economic Potential of the Blandsell Mining Co. Claims Nos. 2, 3, 4, 5, North Virgin Mountains, Mohave County, Arizona."

The two rare earth-bearing units are varyingly exposed for a distance of about 2500 feet (see Plate 1). Prospect pits and mine workings have exposed fresh work, but between ASARCO Shaft and the prospect pits area, a distance of 1500 feet, there has been no exploratory excavation and no samples have been collected for rare earth analysis. There is an additional 1000 feet of possible chloritic unit and pegmatite unit to the southwest of the prospect pits that also has not been sampled or prospected.

Because of the lack of information for these two intervals and the need for determining possible subsurface rare earth mineralization, an exploratory drilling program is needed to locate the 10-20 foot wide zone of mineralization at depth.

#### ORE RESERVES CLASSIFICATION

As pointed out by Hutchinson (Hutchinson, op cit., pages 15-16) due to the lack of information on metal content of the 1500 feet between ASARCO shaft and the prospect pits as well as the 1000 feet between the prospect pits and samples BL-13 to BL-16 and (2) the variable average metal values obtained so far, it is most correct and fitting to classify any and all ore reserves on Blandsell Claim Nos. 2, 3, 4, 5 as "Inferred Ore" or "Possible and/or Extension and/or Theoretical Ore."

*Inferred Ore.* Is ore for which quantitative estimates are based largely on broad knowledge of the geologic character of the deposit and for which there are few, if any, samples or measurements. The estimates are based on an assumed continuity or repetition for which there is geologic evidence; this evidence may include comparison with deposits of similar type. Bodies that are completely concealed may be included if there is specific geologic

evidence of their presence. Estimates of inferred ore should include a statement of the special limits within which the inferred ore may lie.

In commercial mining geology, which is guided primarily by direct economic factors, we find that ore reserves are often classified into the following units: *developed ore, probable ore, and possible and/or extension ore.*

The fundamental meaning of the term "ore" must necessarily be kept in mind. Classifying a mineral deposit as "ore" implies it can be mined "at a profit." Rare earth metals obtained at the ASARCO shaft and the prospect pits area are average to below average. The semi-quantitative rare earth metal values obtained by N.L. Industries, Inc. and L.R. Condie are better than average and encouraging. The assays by N.L. Industries, Inc. and L.R. Condie appear to have been run on at least several tons of rock material concentrated on a Wilfley concentrating gravity jig table and could be more meaningful.

*Are values based on ore or zone*

#### ORE RESERVE BLOCKS

The drilling program as proposed is planned to test the possible downward extent of the 10-20 foot zone of mineralization at down-dip depths of 100 feet, 200 feet, and 300 feet (see Plate 2). Should drilling prove positive, several intercepts at a depth of 500 feet might be drilled.

The four isometric-inclined block diagrams showing both two-dimensional and three-dimensional location and dimensions of the inferred or theoretical ore blocks have been drawn in order to show the elongate, planar geometry of the deposit. The ore blocks are designated Block A, Block B, Block C and Block D from northeast to southwest across Blandsell Claims 2, 3, 4, and 5. In view of the relative strength of the rare earth metal assays at ASARCO shaft, it will be interesting to see if the mineralization

present there continues below the surface to the northeast along the N65°E structural trend. Based on assay values of the extreme southwest end of the trend, the rare earth metal values on the surface have deteriorated to be unimportant as shown by samples BL-13 to BL-16 (Hutchinson, op. cit.).

Table 1 gives the dimensions and proximate tonnages of minable "possible" or "theoretical" ore in long tons in Blocks A, B, C, and D. Minimal information exists of course for Blocks B and D, while more positive information exists for Blocks A and C. This is due to the absence of any assay values for the 1500-foot and the 1000-foot interval as described earlier.

Three-dimensional, pictorial representation of the rare earth mineralization in a series of these; Ore Blocks A, B, C, D enables one to see more clearly the elongate, planar character of the mineralization as developed geologically by field mapping. Such a dimensional presentation makes it considerably easier for the drillers to visualize and drill into the "target" zone.

On the lower left corner of Plate 2 is presented a vertical profile cross-section of a typical proposed exploratory drill site as planned to test the down-dip mineralization at Prospect Pit No. 1 (see Plate 1 in vicinity of the Adit). The total exploratory drilling project, as preliminarily planned proposes two drill sites for each of the four ore blocks as shown in Plate 2. It is thought advisable, at this point in time, to intercept the 10-20 foot thick zone of mineralization at succeeding deeper depths of 100 feet, 200 feet and 300 feet. However, this plan could be changed depending conditions encountered during the actual drilling operations. It might be advisable to eliminate the 200-foot depth and just drill the 100-foot and 300-foot depths. But this cannot be decided ahead of time now.

TABLE 1  
 DIMENSION AND PROXIMATE TONNAGE OF  
 POSSIBLE OR THEORETICAL ORE BLOCKS A, B, C, D,

<u>Block A</u>			<u>Long Tons</u>	<u>Block B</u>			<u>Long Tons</u>
Width	Length	Height (feet)		Width	Length	Height (feet)	
10	600	100	50,000	10	750	100	62,500
10	600	200	100,000	10	750	200	125,000
10	600	300	150,000	10	750	300	187,500

<u>Block C</u>			<u>Long Tons</u>	<u>Block D</u>			<u>Long Tons</u>
Width	Length	Height (feet)		Width	Length	Height (feet)	
10	600	100	50,000	10	600	100	50,000
10	600	200	100,000	10	600	200	100,000
10	600	300	150,000	10	600	300	150,000

NOTE: Volume factor of 12 cubic feet per ton was used in converting from cubic feet to long tons.

## EXPLORATORY DRILLING PROGRAM

Based on the geological mapping of the surficial trend and dip angles of the 10-20 foot mineralization zone, dips 75° to 85° to 90° (vertical) are expected to be encountered down-dip below the surface. The profile of what is thought to be a typical drill site shown on Plate 2 and the total drill core distance shown for intercepting the mineralized zone at down-dip depths of 100-feet, 200 feet and 300 feet can be regarded as what will most likely represent that to be met at each of the 8 drill sites planned for down-dip interceptions at 100 feet, 200 feet, and 300 feet.

It is thought advisable to continue drilling about 50 feet beyond the mineralized zone intercept in order to test the metal values in the granite gneiss wall rock. Samples for analysis will also be taken of the granite gneiss wallrock in the pre-intercept side of 10-20 foot mineralized zone. According to Boyles Bros. Drilling Company, 15865 West 5th Avenue, Golden, Colorado 80401, who are bidding on this job, they can drill for \$7.95-\$8.40 per foot excluding any road work needed. It is important to note, when they are drilling a 5-1/4" hole, that for each 5-foot drill cut interval the tricon bit will produce 70 pounds of sample. Boyles Bros. will "split" this sample at the drilling site, bag it and label it as the geologist wants. Hence, it can readily be seen that a large amount of sample for assay analysis can result from the drilling of 10,000 to 12,000 linear feet. However, the major amount of samples for analysis will be, of course, that of the 10-20 foot mineralized zone with periodic checks taken and collected on the footwall and the hanging wall sides of the mineralized zone.

It is apparent, of course, that there will be a "sample storage" problem during the actual drilling. As estimated, drilling time could take anywhere from about 30 to 40 or 45 days with drillers working 10 hours a day for 10 days with 4 days off

between shifts. Average rate of drilling per day could average about 255-317 feet per day.

#### SUMMARY STATEMENT

The possible economic potential of rare earth mineralization on Blandsell Claims Nos. 2, 3, 4, 5 cannot be finally determined without subsurface exploratory drilling as herein proposed. Boyles Bros. Drilling Company is a nationally and internationally recognized company. It has offices in Reno, Nevada, from which it can provide the drilling equipment and expertise needed to meet quickly the changing and varying demands of a surface drilling project. It should be noted that Boyles Bros. would send a man into the field to visually inspect the terrain problems that will be encountered on the Blandsell Claims prior to actual exploratory drilling. In conversations with Carl D. High, District Manager, March 25 and 26, the point was made that the geologist, of course, needs to show the Boyles Bros. field man the locations of the eight drill sites so that he can estimate any costs concerning possible road improvement and drilling logistics, etc.

It is recommended that Blandsell Mining Co. proceed with financing an exploratory drilling programs on the Blandsell Claim Nos. 2, 3, 4, and 5 in order to determine finally the present worth of the rare earth mineralization at the current spot price of the rare earths presently in economic and industrial demand.

#### COST ESTIMATE

It is not possible to give a specific cost total for the proposed project. A suggested proximate set of numbers is given below, but this is variable depending on several factors: (1) final costs of the exploratory drilling program, (2) cost of all chemical analyses made, (3) consulting fees of Dr. Hutchinson which includes the final report, (4) ancillary costs such as travel, lodging, postage for samples, and (5) possible purchase of



storage facilities for field storage of possibly several thousand pounds of samples for analysis collected during drilling.

PROXIMATE COST ESTIMATE

- Boyles Bros. Drilling 10,000 ..... \$107,000-\$110,000  
(See Boyles Bros. contract of March 27, 1990)
  - Possible Job Site Costs by Boyles Bros., i.e.  
Movement of Equipment from Reno, Nevada, etc..... \$5,000
  - Chemical and X-ray Analysis of Samples..... \$4,000-\$6,000
  - Consulting Fees in Field and Preparing  
Final Report @ \$400/day for Possibly  
30-45 days..... \$12,000-\$18,000
  - Travel and Living Expenses, Jeep Rental.....\$5,000
- ESTIMATED PROXIMATE TOTAL COSTS ..... \$134,000-\$145,000

DIAMOND CORE DRILLING  
ROTARY DRILLING  
GROUTING  
FOUNDATION TESTING  
DIRECTIONAL DRILLING  
ORIENTATION  
ENVIRONMENTAL DRILLING  
WATER WELLS



A CBC COMPANY

General Offices and Plant  
1707 South 4490 West P.O. Box 25068  
SALT LAKE CITY, UTAH 84125  
(801) 972-3333 FAX 972-6769

DISTRICT OFFICES:  
ANCHORAGE, ALASKA  
PHOENIX, ARIZONA  
GOLDEN, COLORADO  
SPARKS, NEVADA  
READING, PENN.  
MURFREESBORO, TENN.  
SALT LAKE CITY, UTAH  
SPOKANE, WASHINGTON  
SANTIAGO, CHILE  
LIMA, PERU

March 27, 1990

BLANDELL MINING COMPANY  
AND SUB ROSA, INC.  
4380 George Town Square II  
Suite 1016  
Atlanta, GA. 30338

ATTENTION: Wade D. Conley Jr.

Gentlemen:

We are pleased to submit our quotation (per the attached Exhibit A), for Reverse Circulation drilling on your project located in Mohave County near Mesquite, Nevada.

Should we be awarded your contract, prior to mobilization, it will be necessary to make financial arrangements with our credit manager Glenn Miller at (801)972-3333.

Should you desire additional information concerning our proposal, please do not hesitate to contact J.R. Kincade of our Rocky Mountain Hard Rock office, at (303)279-7913. Should you accept our bid as submitted, please sign and return both copies, at which time we will sign and return one copy for your files.

Thank you for affording us the opportunity to bid on your project. We look forward to being of service to you.

Very truly yours,

Gerald T. Blackburn  
Manager, Contracts Administration

GTB/js

Enclosures  
cc: J.R. Kincade

Post-It™ brand fax transmittal memo 7671		# of pages ▶ 5
To JUNIOR	From BBDCC	
Co. BBDCC	Co. G Blackburn	

EXHIBIT A  
REVERSE CIRCULATION DRILLING AGREEMENT

A. ADMINISTRATIVE INFORMATION:

1. BLANDSELL MINING COMPANY AND SUB ROSA, INC., hereinafter referred to as the Company.
2. Boyles Bros. Drilling Company, hereinafter referred to as the Contractor.
3. Date of Agreement: March 27, 1990.
4. The initial project shall consist of approximately 10,000 feet.
5. Location:  
MOHAVE County, near: MESQUITE, NEVADA.

B. SCHEDULE OF RATES:

1. Mobilization and Demobilization

(a) Total cost of mobilization from point of origin to point of access of supply truck will be accomplished for the lump sum of \$6,000.00 per drill unit requested. This cost will be invoiced with first drilling invoice.

(b) Demobilization: No charge

2. Drilling Rates:

Hole Size:

REVERSE CIRCULATION

-60 to 90 degrees    -45 to 60 degrees

Depth:	0 - 500 Feet	\$7.95	\$8.40
	500 - 1000 Feet	\$8.75	\$9.20

3. Hourly Rates:

(a) Time consumed in the following activities will be invoiced at the rate of \$160.00 per hour per three man crew.

---

- (a.1) Cementing, waiting for cement to set during normal shift hours, drilling out cement, hole conditioning, and lost circulation.
- (a.2) Installation and recovery of casing.
- (a.3) Moving between holes, setting up, and tearing down including first and last hole.
- (a.4) Standby time ordered by the Company's representative.
- (a.5) Delays caused by the Company.
- (a.6) Downhole surveying.

4. Rate for Special Activities:

Time consumed in the performance of the following activities will be invoiced as follows:

- (a) Reaming will be invoiced at the rate of \$160.00 per crew hour. All bits and materials consumed will be invoiced at list price plus 15% plus freight costs.
- (b) If the formation or water conditions cause the average penetration rate to fall below 30 feet per operating hour over 2 drilling hours, Contractor shall invoice at the rate of \$210.00 per crew hour plus the cost of bits and materials consumed from the end of the second qualifying hour until the hole is completed, or normal reverse circulation is required.
- (c) A down-the-hole hammer will be invoiced at the rate of \$ N/A. per week.
- (d) If a third-party survey instrument is required, Contractor will secure same and invoice the Company at list price plus 15% plus freight costs.

- (e) Water truck will be invoiced at \$50.00 per day for each two wheel drive truck, plus \$1.25 per mile driven; if the helper can function as a driver in addition to his other duties without causing operational delay. Operational delay will be invoiced at the rate in 3.
  - (e.1) If, in the opinion of Contractor, a full time driver is required, his services will be invoiced at \$210.00 per ten hour day worked.
  - (e.2) If a third-party hauler is utilized, all costs will be invoiced to the Company at cost plus 15%.
- (f) Subsistence in the amount of \$ N/A. per day per man will be invoiced to the Company.
- (g) Booster Compressor if required will be charged at third party cost plus fuel and freight on compressor plus 15% handling.

5. Materials:

- (a) Casing lost, damaged, or left in the hole at the Company's request, core boxes, cement, drilling mud, mud additives, lost circulation materials consumed, casing shoes damaged or left in the hole will be invoiced to the Company at list price plus 15%.
  - (b) All materials, including but not limited to diamond, rotary or down-the-hole bits, core barrels, rods, casing, drill muds and additives consumed in hourly work will be invoiced at list price plus 15%.
6. Should down hole conditions including, but not limited to excessive water, caving, sloughing or broken formations, result in damaged or lost drill rods, bits, subs or other down hole tools, Contractor will charge for said tools at a rate to be determined.

C. EQUIPMENT AND WORKING SCHEDULES:

1. Contractor will endeavor to assign the following equipment:

Drill Rigs: SCHRAMM 685 D H TRUCK MOUNT.

Vehicles: F-700 WATER TRUCK.  
F-260 PICKUP.

Rotary rods, down-the-hole hammers, casing, bits, hand tools and accessories as are required to drill holes of the sizes and to the depths listed in Section B-2.

2. Contractor will endeavor to assign one crew to this project and operate the above listed equipment ten hours per day, 10 days on, 4 days off until the project is completed.

Bondar-Clegg & Company Ltd.  
 130 Pemberton Ave.  
 North Vancouver, B.C.  
 TP 2R5  
 (4) 985-0681 Telex 04-352667



Certificate  
 of Analysis

TABLE 1 - GEOCHEMICAL ANALYSES A DIVISION OF INCHCAPE INSPECTION & TESTING SERVICES  
 FOR GOLD AND SILVER - PAGE 1

DATE PRINTED: 29-NOV-89

REPORT: V89-08267.4

PROJECT: NONE GIVEN

PAGE 1

SAMPLE NUMBER	ELEMENT UNITS	Au OPT	Ag OPT
R2 BL-2		<0.002	<0.02
R2 BL-3A-3B		<0.002	<0.02
R2 BL-3C		<0.002	<0.02
R2 BL-3D		<0.002	<0.02
R2 BL-4		<0.002	<0.02
R2 BL-5		<0.002	<0.02
R2 BL-6		<0.002	<0.02
R2 BL-7		<0.002	<0.02
R2 BL-8		<0.002	<0.02
R2 BL-9		<0.002	<0.02
R2 BL-10		<0.002	<0.02
R2 BL-12		<0.002	<0.02
R2 BL-13		<0.002	<0.02
R2 BL-14		<0.002	<0.02
R2 BL-15		<0.002	<0.02
R2 BL-16		<0.002	<0.02
R2 BL-17		<0.002	<0.02
R2 BL-18		<0.002	<0.02

Bondar-Clegg & Company Ltd.  
130 Pemberton Ave.  
North Vancouver, B.C.  
V2R5  
985-0681 Telex 04-352667



Certificate  
of Analysis

TABLE 1 - PAGE 2

A DIVISION OF INCHCAPE INSPECTION & TESTING SERVICES

DATE PRINTED: 29-NOV-89

REPORT: V89-08265.4

PROJECT: NONE GIVEN

PAGE 1

SAMPLE NUMBER	ELEMENT UNITS	Au OPT	Ag OPT
R2 BL-1		0.002	<0.02
R2 BL-11		0.002	<0.02



Bondar-Clegg & Company Ltd.  
 130 Pemberton Ave.  
 North Vancouver, B.C.  
 P 2R5  
 (1) 985-0681 Telex 04-352667



Geochemical  
 Lab Report

TABLE 2 - GEOCHEMICAL ANALYSES  
 FOR Ce, La, Y - PAGE 1.

A DIVISION OF INCHCAPE INSPECTION & TESTING SERVICES

DATE PRINTED: 29-NOV-89

REPORT: V89-08267.0

PROJECT: NONE GIVEN

PAGE 1

SAMPLE NUMBER	ELEMENT UNITS	Ce PPM	La PPM	Y PPM
R2 BL-2		<5	20	17
R2 BL-3A-3B		370	130	430
R2 BL-3C		480	210	1300
R2 BL-3D		500	250	830
R2 BL-4		50	40	58
R2 BL-5		240	120	230
R2 BL-6		220	100	170
R2 BL-7		220	100	190
R2 BL-8		71	35	<5
R2 BL-9		65	27	15
R2 BL-10		330	140	365
R2 BL-12		360	175	410
R2 BL-13		50	35	15
R2 BL-14		7	13	<5
R2 BL-16		<5	7	<5
R2 BL-17		660	280	765
R2 BL-18		<5	<5	<5

Bondar-Clegg & Company Ltd.  
130 Pemberton Ave.  
North Vancouver, B.C.  
V2R5  
(604) 985-0681 Telex 04-352667



# Geochemical Lab Report

TABLE 2 - GEOCHEMICAL ANALYSES  
FOR Ce, La, Y - PAGE 2.

A DIVISION OF INCHCAPE INSPECTION & TESTING SERVICES

DATE PRINTED: 29-NOV-89

REPORT: V89-08265.0

PROJECT: NONE GIVEN

PAGE 1

SAMPLE NUMBER	ELEMENT UNITS	Ce PPM	La PPM	Y PPM
R2 BL-1		40	32	22
R2 BL-11		750	330	1200



TABLE 3 - GEOCHEMICAL ANALYSIS FOR 14  
 RARE EARTH ELEMENTS + Sc, Th, AND U. FINCHCAPE INSPECTION & TESTING SERVICES

DATE PRINTED: 3-JAN-90

REPORT: V89-08267.0 PAGE 1

PROJECT: NONE GIVEN PAGE 1A

SAMPLE NUMBER	ELEMENT UNITS	Ce PPM	Dy PPM	Er PPM	Eu PPM	Gd PPM	Ho PPM	La PPM	Lu PPM	Nd PPM	Pr PPM	Sc PPM
R2 BL-2		12	2.8	<50	<0.5	<100	1.0	4.9	0.67	8	<25	8.83
R2 BL-3A-3B		260	75.3	50	1.8	<100	19.0	102.0	3.40	99	31	7.63
R2 BL-3C		427	196.0	78	2.7	<500	41.0	160.0	8.72	140	56	11.70
R2 BL-3D		491	136.0	80	2.7	<500	32.0	196.0	5.49	200	80	13.10
R2 BL-4		77	13.0	<50	0.9	<100	2.7	33.6	0.62	33	<25	6.18
R2 BL-5		273	54.0	<50	1.7	<100	13.0	106.0	2.50	150	30	9.12
R2 BL-6		363	47.0	<50	1.6	<100	9.1	145.0	2.00	200	52	6.26
R2 BL-7		200	46.0	<50	1.1	<100	11.0	81.5	2.20	110	<25	7.77
R2 BL-8		49	4.5	<50	0.8	<100	0.6	21.0	0.25	24	<25	3.70
R2 BL-9		65	5.7	<50	1.2	<100	1.4	29.3	0.47	33	<25	13.10
R2 BL-10		317	61.0	<50	1.5	<100	14.0	127.0	2.80	170	44	12.40
R2 BL-12		364	74.4	60	1.5	<100	17.0	146.0	3.20	200	45	10.60
R2 BL-13		71	5.6	<50	1.2	<100	1.2	33.1	0.39	36	<25	17.70
R2 BL-14		19	2.3	<50	0.7	<100	0.6	8.6	0.14	13	<25	2.80
R2 BL-15		97	7.3	<50	2.2	<100	1.7	42.9	0.53	50	<25	15.20
R2 BL-16		6	0.6	<50	0.5	<100	<0.5	3.1	0.05	5	<25	0.56
R2 BL-17		578	116.0	55	2.1	<200	26.0	201.0	5.35	290	50	8.67
R2 BL-18		4	1.0	<50	<0.5	<100	<0.5	1.8	0.07	<5	<25	1.70



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TABLE 3 - GEOCHEMICAL ANALYSIS FOR 14

RARE EARTH ELEMENTS + Sc, Th, U, A DIVISION OF INCHCAPE INSPECTION & TESTING SERVICES

DATE PRINTED: 3-JAN-90

REPORT: V89-08267.0 AND U.

PAGE 2

PROJECT: NONE GIVEN

PAGE 1B

SAMPLE NUMBER	ELEMENT UNITS	Sm PPM	Tb PPM	Th PPM	Tm PPM	U PPM	Yb PPM	Ce PPM	La PPM	Y PPM
R2 BL-2		1.50	<0.5	14.0	<1	14.0	4.4	<5	20	17
R2 BL-3A-3B		42.10	10.0	123.0	7	38.0	28.8	370	130	430
R2 BL-3C		66.90	24.0	311.0	19	106.0	73.4	480	210	1300
R2 BL-3D		73.30	18.0	201.0	12	63.3	48.0	500	250	830
R2 BL-4		9.42	1.8	39.2	1	11.0	4.5	50	40	58
R2 BL-5		39.70	8.7	112.0	4	27.0	19.0	240	120	230
R2 BL-6		53.10	7.9	119.0	3	25.0	15.0	380	185	170
R2 BL-7		29.40	7.0	101.0	4	25.0	17.0	220	100	190
R2 BL-8		4.30	0.7	18.0	<1	2.1	1.6	71	35	<5
R2 BL-9		6.24	1.0	13.0	<1	3.2	3.3	65	27	15
R2 BL-10		42.50	10.0	115.0	5	33.0	21.5	330	140	365
R2 BL-12		51.10	11.0	138.0	5	36.0	24.4	360	175	410
R2 BL-13		6.47	0.9	14.0	<1	5.5	3.0	50	35	15
R2 BL-14		1.90	<0.5	4.1	<1	1.7	1.0	7	13	<5
R2 BL-15		9.05	1.3	12.0	<1	4.3	3.6	74	57	<5
R2 BL-16		0.75	<0.5	8.5	<1	2.9	0.3	<5	7	<5
R2 BL-17		69.90	16.0	220.0	10	54.8	39.0	660	280	765
R2 BL-18		0.65	<0.5	0.9	<1	0.6	0.5	<5	<5	<5

Bondar-Clegg & Company Ltd.  
 130 Pemberton Ave.  
 North Vancouver, B.C.  
 V2R5  
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Geochemical  
 Lab Report

PLATE 3 -- GEOCHEMICAL ANALYSIS FOR 14  
 RARE EARTH ELEMENTS + Sc, Th A DIVISION OF INCHCAPE INSPECTION & TESTING SERVICES

DATE PRINTED: 3-JAN-90

REPORT: V89-08265.0 AND U. PAGE 3

PROJECT: NONE GIVEN PAGE 1A

SAMPLE NUMBER	ELEMENT UNITS	Ce PPM	Dy PPM	Er PPM	Eu PPM	Gd PPM	Ho PPM	La PPM	Lu PPM	Nd PPM	Pr PPM	Sc PPM
R2 BL-1		40	5.1	<50	<0.5	<100	1.2	19.0	0.66	16	<25	6.64
R2 BL-11		756	205.0	96	2.6	<500	44.0	304.0	7.60	300	74	13.20

Bondar-Clegg & Company Ltd.

130 Pemberton Ave.

North Vancouver, B.C.

TP 2R5

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# Geochemical Lab Report

TABLE 3 - GEOCHEMICAL ANALYSIS FOR 14

RARE EARTH ELEMENTS + Sc, Th, and U, DIVISION OF INCHCAPE INSPECTION & TESTING SERVICES

DATE PRINTED: 3-JAN-90

REPORT: V89-08265.0

PAGE 4

PROJECT: NONE GIVEN

PAGE 1B

SAMPLE NUMBER	ELEMENT UNITS	Sm PPM	Tb PPM	Th PPM	Tm PPM	U PPM	Yb PPM	Ce PPM	La PPM	Y PPM
R2 BL-1		3.30	0.7	15.0	<1	13.0	4.8	40	32	22
R2 BL-11		112.00	27.0	269.0	16	110.0	64.3	750	330	1200

## APPENDIX

20

TABLE A-1. - Pegmatites investigated

Property	County and location	Occurrence(s)	Principal minerals <sup>1</sup>	General development of property	Sample description	Percent BeO <sup>2</sup>	Remarks
Arizona							
1. Thompson Beryl (5 claims).	Cochise Secs 14, 23, T 20 S, R 27 E.	Narrow fractures filled with quartz.	Pale blue beryl crystals 1 in by 3/8 in.	Small sidehill cuts	(1) 8-ft sample in granite along quartz vein. (2) 14 in across quartz vein. (3) 8 in across quartz vein. (4) 10 in across quartz vein. (5) 6 in across quartz vein near beryl cluster. Stripped debris	0.003c .10e .37e .58e 1.67e	Few 100 lbs of aquamarine beryl had been collected for gemstones.
2. Ambly.....	Maricopa Sec 7, T 6 N, R 4 W.	Small; unzoned	Grey lepidolite	Open cut	-	-	Chemical analysis gave 2.0% Li <sub>2</sub> O.
3. Estermill Group (12 claims).	Maricopa NW1/4, sec 36, T 1 S, R 3 W.	Unzoned; 2 to 10 ft wide; in schist	Muscovite in 1-1/2- to 4-in books	6-ft-deep pit and open cut.	-	-	Muscovite scrap grade.
4. Morning Star.....	Maricopa NW1/4, sec 16, T 7 N, R 3 W.	Bulbous; northern: 600 ft long, 100 ft wide; southern: 300 ft long, 75 ft wide.	Spodumene, amblygonite, sparse lepidolite, scant columbite.	-	-	-	(12) <sup>3</sup>
5. Alma.....	Mohave NE1/4, sec 26, T 17 N, R 14 W.	Dikes; 150 ft long, 1 in. to 2 ft wide, 5 ft deep; in granite.	Euxenite, monazite, samarskite, bismite, fergusonite, beryl, Ag minerals.	4 sidehill cuts	-	-	-
6. Aquarius Cliffs..	Mohave SE part <sup>4</sup> T 17 N, R 12 W.	Numerous narrow, partly zoned bodies.	Green beryl, monazite, euxenite.	Open cuts and trenches.	Grab of beryl-bearing zone.	.005c	-
7. Bayview Beryllium Group (6 claims).	Mohave Sec 7, T 15 N, R 13 W.	Unzoned; in granite gneiss.	Beryl	3 sidehill cuts	Selected	10.00c <sup>5</sup> 13.00c <sup>5</sup>	-
8. Duncan Mine.....	Mohave NE1/4, sec 12, T 20 N, R 11 W.	Pipe with radiating dikes.	Magnetite, hematite, gadolinite.	Small open cuts	Selected	-	Spectrographic analysis indicated presence of Cb, Ta, R.E. <sup>6</sup>
9. Hummingbird Group (6 claims).	Mohave Approx. <sup>4</sup> T 39 N, R 15 W.	750 ft long, 1 to 5 ft wide; concordant to mica schist.	Blue beryl 1/16 to 1 in. in diameter, muscovite, kyanite.	Open cut on each of 3 pegmatites.	Grab--open cut No. 1 2 ft chip--open cut No. 2 2-ft chip--open cut No. 3.	.54c .24c .14c	(16)
10. Jeanene (3 claims).	Mohave Secs 30, 31, T 16-1/2 N, R 15 W	Zoned; 300 ft long, 100 ft wide.	Large beryl crystals	Stripped area	Selected granitic samples	1.0-3.92c <sup>7</sup> 0,0,0,0,0, 0,0,0e	-
11. Mica Ace (7 claims).	Mohave Sec 24, T 19 N, R 17 W.	Discontinuous; 500 ft long, 20 to 30 ft wide.	Muscovite	Bulldozed cuts	-	-	Some punch mica occurs in deposit.
12. Mica Giant (4 claims).	Mohave. Sec 10, T 19 N, R 15 W.	Dikes; in granite	Muscovite	-	-	-	Some punch and sheet mica occurs in deposit.
13. Rare Metals Mine.	Mohave	Parallel dikes; 2 to 100 ft wide	Euxenite, monazite, samarskite, bismite.	Open cuts, shaft, adit.	-	-	-

TABLE 4 - LIST OF SAMPLES, WITH THEIR LOCATIONS, COLLECTED FOR CHEMICAL ANALYSIS FOR GOLD AND SILVER AND RARE EARTH ELEMENTS

SAMPLE NUMBER	DESCRIPTION	PROXIMATE WEIGHT OF SAMPLE
BL-1	Material collected from broken rock on dump at prospect pit dug into biotite-quartz-feldspar gneiss at north edge of Blandsell No. 13 Claim. Material does not appear to have come from the prospect pit but was brought in and dumped.	20 lb.
BL-2	Same location as BL-1 but material was collected from different places than was BL-1.	20 lb.
BL-3A	Chip channel sample cut for 6' horizontally across east face of open pit in greenish chloritic gneissic schist. Channel cut 2 feet from top of wall or face.	20-25 lb.
BL-3B	Continuation of chip channel cut of BL-3A for an additional 2 feet across the same greenish chloritic schist. <u>NOTE:</u> Samples BL-3A and BL-3B were combined in a single sample for assaying.	20 lb.
BL-3C	Chip channel cut across a 3-foot granite pegmatite on south side of prospect pit wall in contact with the green gneissic chlorite schist on east side.	20 lb.
BL-3D	Sample of pit 1' above floor of pit	20 lb.
BL-4	Chip channel sample cut across surface exposure of the green gneissic chlorite schist. This is a continuation of Sample No. BL-3A and BL-3B but is a surface cut. Length of chip channel cut is 3 feet.	20 lb.
BL-5	Chloritized and migmatized sheared metagranite (?) in the footwall of the pegmatized hanging wall. 8-foot chip channel cut.	20 lb.
BL-6	A 7-foot chip channel cut across pegmatite and also pegmatized metagranite wallrock.	20 lb.
BL-7	An 8-foot chip channel cut across east and west faces of open prospect pit in pegmatized metagranite.	20 lb.



PROXIMATE SAMPLE NUMBER	DESCRIPTION	WEIGHT OF SAMPLE
BL-8	Chip channel cut 2 feet across granite pegmatite at mine adit or tunnel striking about N 20 W or S 20 E.	20 lb.
BL-9	Chip channel cut for 8 feet across gneissic granitic rock in the footwall of the pegmatite dike.	20 lb.
BL-10	ASARCO shaft sample collected from south portion of loose dump material which is the greenish chloritic gneissic schist unit	20 lb.
BL-11	ASARCO shaft sample collected from central part of loose dump material which is intensely green, more so than the rock in samples Nos. BL-10 and BL-12.	20 lb.
BL-12	ASARCO shaft sample collected from loose dump material on north side of the dump material lying on the east side of the shaft.	20 lb.
BL-13	A 7-foot chip channel cut across a biotite-quartz-feldspar gneiss, thinly banded striking N 70° E, 90° (vertical dip). Does not appear chloritic.	20 lb.
BL-14	A banded granite pegmatite (quartz-microcline) 1-1/2 feet wide striking N 70° E, 90°. 20 lb.	
BL-15	4-1/2 foot chip sample cut across gneissic unit which may be slightly chloritic next to a 1-1/2 foot granite pegmatite. Gneiss strikes N 63°E, dips 90°.	20 lb.
BL-16	A chip channel sample cut across a 1-foot pegmatite. Strike and dip same as BL-15 sample.	20 lb.
BL-17	A 150 lb. block of the greenish chloritic gneissic schist lying in the prospect pit floor was broken up and sampled for analysis.	20 lb.
BL-18	White tourmaline-bearing granite pegmatite was sampled at the stream by the adit and also in south end of Blandsell No. 4 Claim from loose rock dumped on the surface at the edge of the road.	20 lb.

TABLE 5 - CONVERSION TABLE FOR PPM AND WT % of RARE EARTH ELEMENTS

PPM	WT. %
50	0.005
100	0.01
200	0.02
300	0.03
400	0.04
500	0.05
600	0.06
700	0.07
800	0.08
900	0.09
1,000	0.1%
1,500	0.15%
1,580	0.158%
2,000	0.20%
5,000	0.50%
10,000	1.00%
10,500	1.5%
20,000	2.0%
100,000	10.0%

TABLE 6 - GEOCHEMICAL ANALYSES FOR Ce, La, Y, Sm, Nd  
IN PROSPECT PITS - ADIT AREA AND THE ASARCO SHAFT

PROSPECT PITS - ADIT AREA

<u>Sample #</u>	<u>Ce</u>	<u>La</u>	<u>Y</u>	<u>Sm</u>	<u>Nd</u>	
<u>Pit No. 1</u>						
BL-3A +3B	{260-(314) {370	{130-(116) {102	430	42.10	8	chlorite rock
BL-3C	{480-(454) {427	{210-(185) {160	1300	66.90	99	pegmatite
BL-3D	{500-(496) {491	{250-(223) {196	830	73.30	140	chlorite rock
BL-4	{50-(64) {77	{40-(37) {33.6	58	9.42	33	chlorite rock
BL-17	{578-(619) {660	{201-(241) {280	765	69.90	290	chlorite rock
<u>Pit No. 2</u>						
BL-5	{240-(257) {273	{120-(113) {106	230	39.70	150	chlorite rock
BL-6	{380-(372) {363	{185-(165) {145	170	53.10	200	pegmatite
<u>Pit No. 3</u>						
BL-7	{220-(210) {200	{100-(91) {81.5	190	29.40	110	pegmatized granite gneiss
<u>Adit Area</u>						
BL-8	{49-(60) {71	{35-(28) {21	<5	4.30	24	pegmatite
BL-9	{65-(65) {65	{27-(28) {29.3	15	6.24	33	granite gneiss
<u>ASARCO Shaft</u>						
BL-10	{330-(324) {317	{140-(134) {127	365	42.50	170	chloritic rock
BL-11	{756-(753) {750	{304-(317) {330	1200	112	300	chloritic rock
BL-12	{360-(362) {364	{175-(161) {146	410	51.10	200	chloritic rock

XXXX QUALITATIVE  
XXXX SEMI-QUANTITATIVE  
 \_\_\_\_\_ QUANTITATIVE

**ANALYTICAL REPORT**

TO: L.R. Condie

Job Number 14499  
 Page 1 of 1 Pages  
 Date 27 Apr 1972

SAMPLE: ck 20 Apr 72

NOTE: The values below are estimated percentages for the metal equivalent of the indicated elements. No check was made for elements with atomic numbers less than 22 (below titanium).

Copper 0.005  
 Silver \_\_\_\_\_  
 Gold \_\_\_\_\_  
 Zinc 0.006  
 Cadmium \_\_\_\_\_  
 Mercury \_\_\_\_\_  
 Gallium \_\_\_\_\_  
 Indium \_\_\_\_\_  
 Thallium \_\_\_\_\_  
 Germanium \_\_\_\_\_  
 Tin \_\_\_\_\_  
 Lead 0.016  
 Arsenic \_\_\_\_\_  
 Antimony \_\_\_\_\_  
 Bismuth \_\_\_\_\_  
 Selenium \_\_\_\_\_  
 Tellurium \_\_\_\_\_  
 Bromine \_\_\_\_\_  
 Iodine \_\_\_\_\_

Iron 1.4  
 Cobalt \_\_\_\_\_  
 Nickel 0.002  
 Cesium \_\_\_\_\_  
 Rubidium 0.020  
 Barium 0.14  
 Strontium 0.018  
 Titanium 0.13  
 Zirconium 0.018  
 Hafnium \_\_\_\_\_  
 Thorium 0.14  
 Vanadium \_\_\_\_\_  
 Columbium \_\_\_\_\_  
 Tantalum \_\_\_\_\_  
 Chromium \_\_\_\_\_  
 Molybdenum \_\_\_\_\_  
 Tungsten \_\_\_\_\_  
 Uranium \_\_\_\_\_  
 Manganese 0.029

Lanthanum 0.80  
 Cerium 1.7  
 Praseodymium 0.21  
 Neodymium 0.33  
 Samarium 0.049  
 Europium \_\_\_\_\_  
 Gadolinium 0.24  
 Terbium \_\_\_\_\_  
 Dysprosium 0.079  
 Holmium \_\_\_\_\_  
 Erbium 0.047  
 Thulium \_\_\_\_\_  
 Ytterbium 0.026  
 Lutetium \_\_\_\_\_  
 Yttrium 0.53  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

By Merlyn L. Salmon

837-1396

XXXX QUALITATIVE  
XXXX SEMI-QUANTITATIVE  
 \_\_\_\_\_ QUANTITATIVE

**ANALYTICAL REPORT**

TO: NL Industries, Inc

Job Number 14217  
 Page 1 of 5 Pages  
 Date 10 Jan 1972

SAMPLE: RE-9.0-2 TABLE CONC.

NOTE: The values below are estimated percentages  
 the metal equivalent of the indicated elements.  
 check was made for elements with atomic numbers  
 than 22 (below titanium).

Copper	0.011	Iron	2.9	Lanthanum	1.3
Silver		Cobalt		Cerium	3.1
Gold		Nickel		Praseodymium	0.43
Zinc	0.008	Cesium		Neodymium	1.1
Cadmium		Rubidium	0.010	Samarium	0.30
Mercury		Barium	0.18	Europium	0.025
Gallium		Strontium	0.024	Gadolinium	0.95
Indium		Titanium	0.098	Terbium	0.022
Thallium		Zirconium	0.096	Dysprosium	0.61
Germanium		Hafnium		Holmium	0.050
Tin		Thorium	0.61	Erbium	0.61
Lead	0.078	Vanadium		Thulium	0.043
Arsenic		Columbium		Ytterbium	0.16
Antimony		Tantalum		Lutetium	0.027
Bismuth		Chromium	0.029	Yttrium	2.3
Selenium		Molybdenum			
Tellurium		Tungsten			
Bromine		Uranium	0.078		
Iodine		Manganese	0.18		

By Merlyn L. Salmon

XXXX QUALITATIVE  
XXXX SEMI-QUANTITATIVE  
\_\_\_\_\_ QUANTITATIVE

# ANALYTICAL REPORT

TO: NL Industries, Inc

Job Number 14217  
Page 2 of 5 Pages  
Date 10 Jan 1972

SAMPLE: RE-9.0-3 TABLE MIDS

NOTE: The values below are estimated percentages for the metal equivalent of the indicated elements. No check was made for elements with atomic numbers less than 22 (below titanium).

Copper	<u>0.012</u>	Iron	<u>1.7</u>	Lanthanum	<u>0.27</u>
Silver	_____	Cobalt	_____	Cerium	<u>0.51</u>
Gold	_____	Nickel	_____	Praseodymium	<u>0.22</u>
Zinc	<u>0.008</u>	Cesium	_____	Neodymium	<u>0.33</u>
Cadmium	_____	Rubidium	<u>0.018</u>	Samarium	<u>0.15</u>
Mercury	_____	Barium	<u>0.093</u>	Europium	_____
Gallium	_____	Strontium	<u>0.016</u>	Gadolinium	<u>0.34</u>
Indium	_____	Titanium	<u>0.066</u>	Terbium	_____ 2.5
Thallium	_____	Zirconium	<u>0.032</u>	Dysprosium	<u>0.079</u>
Germanium	_____	Hafnium	_____	Holmium	_____
Tin	_____	Thorium	<u>0.17</u>	Erbium	<u>0.12</u>
Lead	<u>0.023</u>	Vanadium	_____	Thulium	_____
Arsenic	_____	Columbium	_____	Ytterbium	<u>0.079</u>
Antimony	_____	Tantalum	_____	Lutetium	_____
Bismuth	_____	Chromium	<u>0.015</u>	Yttrium	<u>0.76</u>
Selenium	_____	Molybdenum	_____	_____	_____
Tellurium	_____	Tungsten	_____	_____	_____
Bromine	_____	Uranium	<u>0.030</u>	_____	_____
Iodine	_____	Manganese	<u>0.055</u>	_____	_____

By Merlyn L. Salmon

NOTE: A PORTION OF THE REPORTED SAMPLES WILL BE RETAINED ON FILE FOR A PERIOD OF FIVE YEARS FROM THE ABOVE DATE. THE REMAINDER OF THE SAMPLE WILL BE RETAINED FOR THIRTY DAYS PENDING RECEIPT OF WRITTEN INSTRUCTIONS FOR DISPOSAL FROM THE ADDRESSEE ABOVE.

TABLE 7C- GEOCHEMICAL ANALYSIS OF HEAVY  
 MINERALS CONCENTRATES.

XXXX QUALITATIVE  
XXXX SEMI-QUANTITATIVE  
 \_\_\_\_\_ QUANTITATIVE

**ANALYTICAL REPORT**

Job Number 14217  
 Page 4 of 5 Pages  
 Date 10 Jan 1972

TO: NL Industries, Inc

SAMPLE: RE-9.0-5 Heavy Minerals

NOTE: The values below are estimated percentages for the metal equivalent of the indicated elements. No check was made for elements with atomic numbers less than 22 (below titanium).

Copper _____	Iron _____ 3.2	Lanthanum _____ 2.7
Silver _____	Cobalt _____	Cerium _____ 6.6
Gold _____	Nickel _____	Praseodymium _____ 0.86
Zinc _____	Cesium _____	Neodymium _____ 1.8
Cadmium _____	Rubidium _____ 0.048	Samarium _____ 0.39
Mercury _____	Barium _____ 0.20	Europium _____ 0.025
Gallium _____	Strontium _____ 0.013	Gadolinium _____ 1.4
Indium _____	Titanium _____ 0.11	Terbium _____ 0.065
Thallium _____	Zirconium _____ 0.16	Dysprosium _____ 0.79
Germanium _____	Hafnium _____	Holmium _____ 0.15
Tin _____	Thorium _____ 1.2	Erbium _____ 0.76
Lead _____ 0.12	Vanadium _____	Thulium _____ 0.032
Arsenic _____	Columbium _____	Ytterbium _____ 0.26
Antimony _____	Tantalum _____	Lutetium _____ 0.019
Bismuth _____	Chromium _____	Yttrium _____ 3.8
Selenium _____	Molybdenum _____	_____
Tellurium _____	Tungsten _____	_____
Bromine _____ 0.11	Uranium _____ 0.16	_____
Iodine _____	Manganese _____ 0.40	_____

By Merlyn L. Salmon

NOTE: A PORTION OF THE REPORTED SAMPLES WILL BE RETAINED ON FILE FOR A PERIOD OF FIVE YEARS FROM THE ABOVE DATE. THE REMAINDER OF THE SAMPLE WILL BE RETAINED FOR THIRTY DAYS PENDING RECEIPT OF WRITTEN INSTRUCTIONS FOR DISPOSAL FROM THE ADDRESSEE ABOVE.

pegmatites on the Czarina  
 explored to a depth of  
 25 miles northeast of the  
 s, at an altitude of about  
 st and contain muscovite,  
 accessory minerals. Mica  
 and sheets 2 by 3 inches

mountains region, described  
 gneiss, schist, and coarse-  
 granitic bodies are a red  
 butte. The coarse-grained  
 4 miles long in east-west  
 of potassium feldspar,  
 t quartz, and some biotite  
 crystals of micropertthite are  
 are nearly 3 inches long.  
 not been found cutting the  
 is relatively fresh and  
 ites in the region, and si-  
 Hill, 1916, p. 47) suggests  
 Cambrian. Dikes of fine-  
 granite and the schist.  
 at Gold Butte and in the  
 y minerals other than feld-  
 104-1406). Many contain  
 e, whereas others are rich  
 matites of the Gold Butte  
 skite, columbite, allanite,  
 addition to the more com-  
 beryl, and the radioactive  
 ce workings. Mica schist  
 a from an open cut about

r on both sides of the Ne-  
 of Virgin Peak (Bunker-  
 of Bunkerville. The de-  
 writer. The general geol-  
 ummingbird claims, east  
 discussion of pegmatites in

In Nevada just west of the State line, about 1.5 miles southwest of the Hummingbird claims, a pegmatite was prospected in 1949, primarily for mica; beryl and possibly phenakite(?) occur there. The belt reportedly containing beryl is several miles long and extends southwest of this prospect; northeast of the Hummingbird claims, pegmatite has been prospected for mica near the edge of the Precambrian block, just west of an area of Cambrian limestone. Small-scale mining for mica was done in this belt many years ago, probably about 1897. Holmes (1904, p. 986) examined mica samples of good quality from deposits on the Snowdrift group of claims on the north side of Virgin Peak.

#### MOHAVE COUNTY, ARIZONA

Many pegmatite dikes occur in the Precambrian rock areas of northwestern Arizona in a wide belt from the Virgin Mountains southward across Lake Mead, through the Cerbat Mountains, the Hualpai Mountains south of Kingman, the large area between Kingman and Wickenburg, and thence southeastward in southern Arizona and Mexico. Four areas in Mohave County north of Kingman were examined briefly. Beryl has been found in tungsten-bearing veins at the Borianna mine, 20 miles southeast of Kingman (Hobbs, 1944, p. 254). Other pegmatite areas to the southeast have been studied and described in detail recently by Jahns (1952).

#### HUMMINGBIRD CLAIMS, VIRGIN MOUNTAINS

A pegmatite containing beryl and chrysoberyl on the Hummingbird claims, on the north side of Virgin Peak (Bunkerville Mountain), in Mohave County, Ariz., was prospected on a small scale for 2 or 3 months beginning February 13, 1949, by Belle Hope Mines, Ltd. This company owns a group of six claims, known as the Hummingbird Nos. 1, 2, and 3 and the Whitebird Nos. 1, 2, and 3. The most recent work was on the Hummingbird No. 3. This deposit, about 12 miles south-southeast of Bunkerville, Nev., may be reached by turning off U.S. Highway 91 at the south end of the Virgin River bridge between Bunkerville and Mesquite. From this point a dirt road extends southeastward about 10 miles to a camp at the base of the range at an altitude of about 3,550 feet. From this camp, a steep mine road extends southward into the range 2 miles to the deposit, which is at an altitude of about 4,550 feet. The pegmatite dike crosses two ravines near their junction.

The Hummingbird prospect is probably the same prospect described by Callaghan (Hewett and others, 1936, p. 162-163) as the



Fool's Gold Nos. 1, 2, and 3. Six samples were collected by Olson in 1949 for spectrographic determination of BeO content and a sketch map of the pegmatite body (fig. 11) was made showing the locations of the samples.

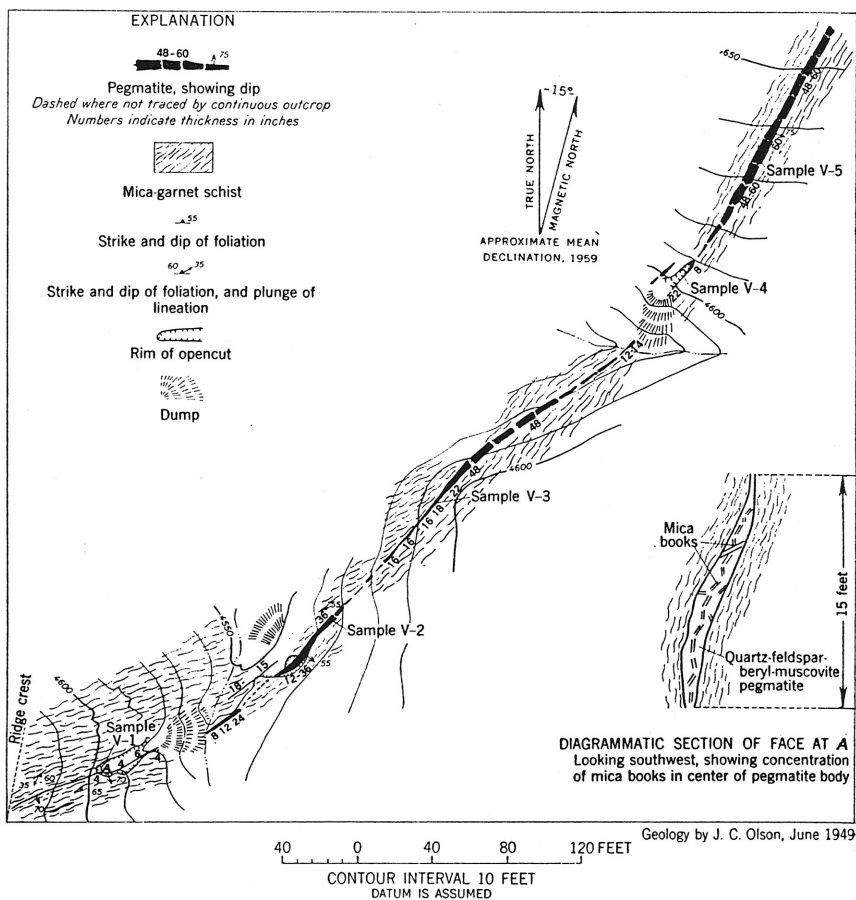


FIGURE 11.—Sketch map of beryl-bearing pegmatite on the Hummingbird claims, Mohave County, Ariz.

The north slopes of Virgin Peak are underlain by Precambrian metamorphic and igneous rocks comprising mica-garnet schist, inter-layered amphibolite and quartz-mica schist, and granitic augen gneiss. Some massive kyanite reportedly has been found in the area. Between the prospect and the base of the range 2 miles to the north, the exposures consist of steeply dipping, probably tightly folded, schist and amphibolite, with a general northeasterly strike, containing many concordant thin sills of pegmatite. Pegmatite bodies as

much as 4 feet thick are common; the schist is also impregnated by much pegmatitic material in thinner bodies. The sills pinch and swell markedly, as shown by the sketch map (fig. 11). Fracture intersections at one place in the schist plunge  $35^\circ$  SW., but the plunge of the pegmatite prospected was not determined.

Three pits 15 feet in maximum depth have been dug in the area shown on the sketch map (fig. 11). It is not certain whether the three pits are all in one pegmatite body, or in two or three very closely related, en echelon bodies. The pegmatites have a northeasterly strike and a dip that ranges from  $55^\circ$  SE. to vertical, averaging about  $75^\circ$ . Southwest of the southwest cut shown on the sketch map (fig. 11), the pegmatite is only 3 to 4 inches thick and consists of quartz and tourmaline; it apparently pinches out near the ridge crest. Northeast of this pit, the thickness ranges from 4 to 60 inches. At the northeast end of the area mapped, the pegmatite may be slightly offset by a fault, but the extension northeastward was not studied.

The pegmatite is composed of white to gray quartz; white, fine- to medium-grained feldspar that is probably mostly plagioclase; rarer perthite as much as 8 inches in grain size; pale green muscovite commonly stained by black inclusions; light bluish-green beryl; yellow and greenish-yellow, tabular, striated crystals of chrysoberyl; black tourmaline; and garnet. The pegmatites in the area are mostly fine grained, although muscovite and perthite are locally coarse-grained. The coarse-grained perthite was noted chiefly in the feldspathic pegmatite about 200 feet northwest of the prospect pits. The largest muscovite books, as much as 18 inches long, occur in pegmatite 6 to 18 inches thick in the southwest cut. In general, the muscovite occurs mostly in the quartzose parts of the pegmatites. The thinner parts are generally more quartzose than the thick, feldspathic pegmatites.

The pegmatites show a banding or streakiness parallel to their walls. The banding in the southwest cut is illustrated by diagrammatic section (fig. 11). Northeast of this point the streakiness is in large part a foliation produced by shearing of the pegmatite and drawing out of the quartz into thin stringers. Curved surfaces coated with fine, pale-greenish muscovite are common in the sheared pegmatite. The 22-inch pegmatite exposed at the northeast pit is foliated and banded as follows: the 3- to 4-inch border zone of quartz, muscovite, and plagioclase is foliated parallel to the walls of the dike; the wall zone of plagioclase, quartz, muscovite, and beryl is also streaked or foliated parallel to the walls; and the core is a sharply defined layer of massive white quartz, which forks in places into two or more nearly parallel quartz layers.

Beryl can be found in nearly every exposure of pegmatite shown on the sketch map. The coarsest grained and most abundant beryl was found in the southwest cut, where it constitutes about 3 percent of the pegmatite 6 to 18 inches thick that is rich in muscovite and quartz. One crystal of beryl 3 inches long was seen in the southwest cut, and crystals 15 inches long have been found. The beryl is mostly in fine grains less than half an inch long, however, and the average grain size is so fine that hand sorting of the beryl would be a costly and impractical method of recovery. The fine grain size also makes it difficult to determine the percentage of beryl in the rock by grain counts, and samples were therefore taken at six points for spectrographic determination of BeO. The beryl content of a considerable part of the pegmatite is probably within the range of 0.5 to 1 percent as indicated by the spectrographic BeO determinations given in table 7.

TABLE 7.—BeO content of pegmatite samples from Hummingbird claims, determined spectrographically

Sample (fig. 11)	BeO <sup>1</sup> (percent)	Thickness of pegmatite where sampled (feet)
V-1-----	0.11	1.0
V-2-----	.11	2.5
V-3-----	.11	1.5
V-4-----	.066	1.5
V-5-----	.055	4.5

<sup>1</sup> BeO content determined spectrographically by Saratoga Laboratories, Saratoga Springs, N.Y.

A pegmatite dike 200 feet northwest of and parallel to the Hummingbird prospects also contains beryllium in the minerals chrysoberyl and beryl. This dike strikes northeast, dips steeply southeast, and pinches and swells in thickness to a maximum of about 10 feet. It contains abundant plagioclase and potassium feldspars. Quartz is not abundant. Other minerals include chrysoberyl, beryl, black tourmaline, and numerous garnet crystals, some exceeding 1 inch in diameter. A sample across the dike 8 feet wide, containing both chrysoberyl and beryl, contains 0.091 percent BeO by spectrographic analysis.

#### PAINTED DESERT

The presence of beryl in pegmatites in the Painted Desert region is mentioned by Nolan (Hewett and others, 1936, p. 17) as follows:

*Painted Desert.*—5 miles from branch railroad at Boulder City, Nev. Recent prospecting in this district has disclosed pegmatites containing minor beryl, quartz-specularite veins containing copper in pre-Cambrian gneiss cut by

#### BERYL-BEARING PEGMATITES

basic dikes, and gold-bearing lodes. Each developed in a sheared basic dike, associated with the pegmatites. Beryl production has been made.

The area 3.5 to 4 miles east of Hoo of the Painted Desert is underlain igneous rocks. These rocks are some composition, strongly sheared, and basic dikes. The pegmatites are mo and many of them strike about N. 30 feldspar, quartz, biotite, garnet, spec Beryl is reported but was not found i half-day reconnaissance. Feldspar constituent. Quartz is a relatively the pegmatite. However one felds a few feet along the strike, into a c taining only a small amount of felds brian intrusive rocks east of the pegmatites also, but they are not know interest.

#### M AND P MIC

Charles M. Sisson, of Los Ange hold six claims known as the M ar Ariz. The claims are reached fro about 30 miles north of Kingman, th Ferry road about 22 miles to the Hualpai Wash from Hackberry. A taken and followed southeastward ranchhouse, where a smaller roa extends about 2 miles to the base of is just a few feet above the break i Mr. Sisson and his partners began 1943, and ceased about 1944 or 1945. was sold to Colonial Mica Corp. dur

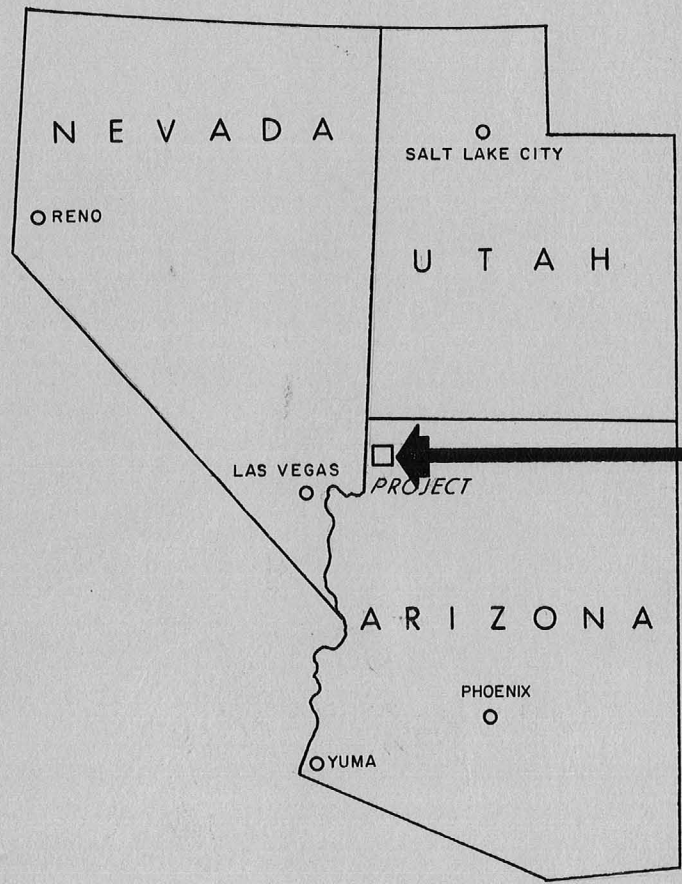
The pegmatite is enclosed in gran exposed, and the size and attitude a probably an irregularly-shaped bod long, with a northwesterly strike a fault exposed in the gully southeast at its south end, but there are no expo

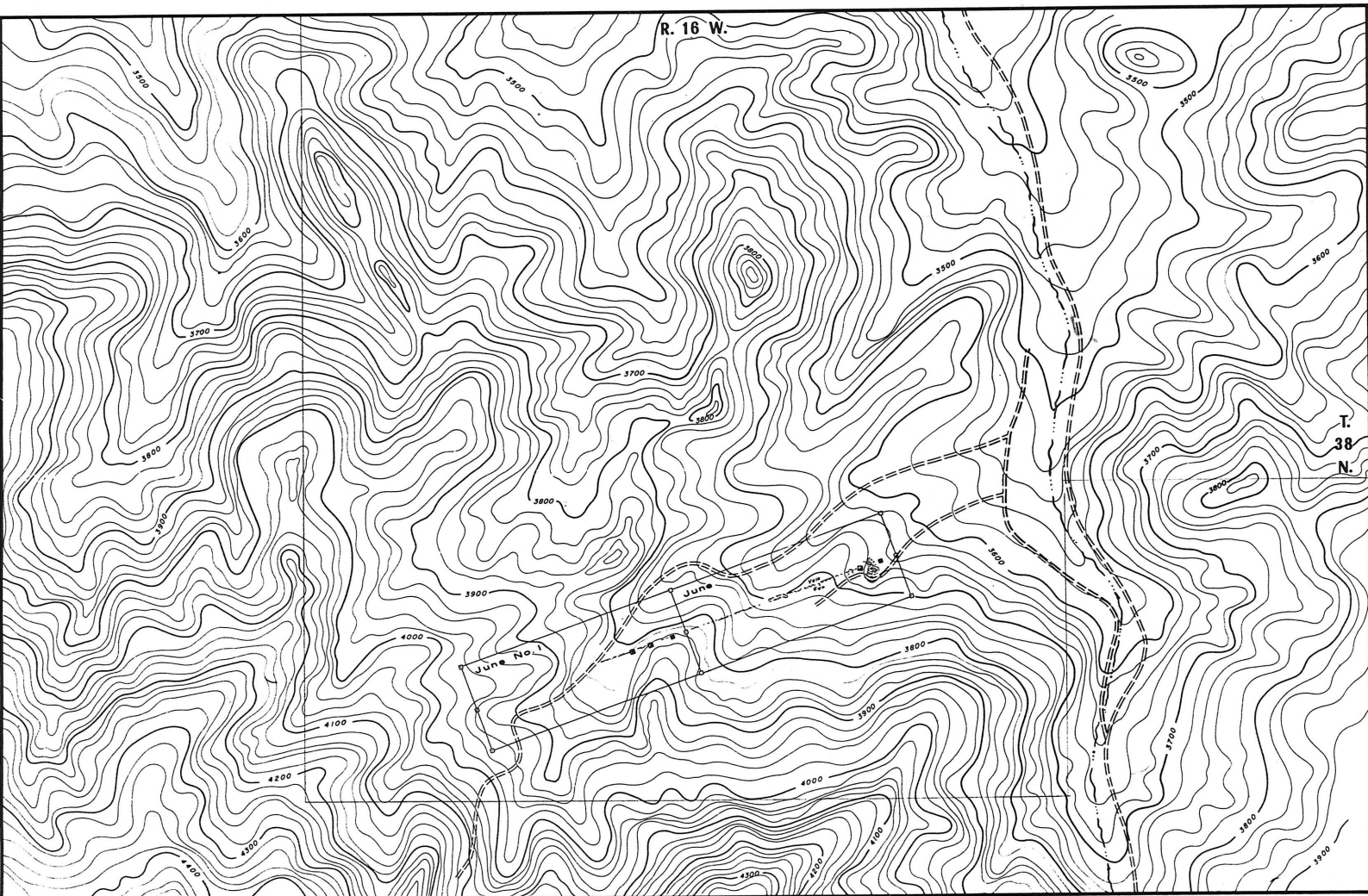
Four small pits and one 40-foot d excavated in the pegmatite where c associated with irregularly shaped p 6 feet thick. The coarsest grained

HUMMING BIRD GROUP - MOTTAVE

# MESQUITE PROJECT

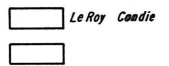
ARIZONA





**EXPLANATION**

**PROPERTY STATUS**



**LEROY CONDIE**  
 3604 Colonial Ave. Los Angeles, Calif. 9000

**TOPOGRAPHIC MAP**  
 CONDIE YTTRIUM RARE-EARTH VEIN  
 (Unsurveyed Area)

Virgin Mountains - Mohave County - Arizona - T 14 S., R. 16 W., Section 33

Scale 1" = 400'	Date June 1973	<b>CY-2</b>
Mapping J Owens - U.S.G.S 15' Quad Base		
Drafting J Owens		

**STAKING REPORT, COMMENTS & RECOMMENDATIONS**

for

**Blandsell Lode Claims**

Mohave County, Arizona  
(Mesquite, Nevada)

by

GEOLOGICAL SERVICES (801) 278-1431  
**JOSEPH OWENS**  
4727 FAIRFIELD ROAD - SALT LAKE CITY - UTAH 84124



August 11, 1989

## PURPOSE AND SCOPE

The purpose and scope of this report is to set forth dated events including office and field procedures occurring between April 21, 1989 and date of this report. Data use in this report is taken from field note books, daily aides and recordings made on base maps as field work progressed on site. Other information provided herein is presented to the best of my recollection at the present time and is considered to be true and correct.

## CLAIM LOCATION ACTIVITY

Several days prior to April 21, 1989 my office received a telephone call from Wade Conley in Atlanta, Georgia, requesting me to return his call as soon as possible, which I did on the above date. Upon returning the call I was questioned by Wade Conley regarding previous field work I had provided for a client in the North Virgin Mountains (Mesquite) area. This mining property is considered by geological investigators and prospectors as a potential rare earth oxide (REO) deposit with vermiculite (mica) barite and gold association. I was informed by Wade Conley that a Mr. M. Anthony Beauchamp, who was a former client of mine, provided my name and address but no telephone number.

During this telephone conversation with Wade Conley I was questioned extensively about my geological services provided to the Beauchamp group who were active in the Musquite area during the mid and latter part of 1982. This group of prospectors consisted of M. Anthony Beauchamp, F. "Fuze" Nance and Wade Pearson. This group requested my services which consisted of a preliminary on site examination and if favorable, preparation of a claim map consisting of 96 lode claims called Era No. 1 to Era No. 96. The field examination occurred sometime early in July of 1982 and on July 13, 1982 I completed and submitted a claim map with topographic base to the above group, now called New Era Mining Company. (d.b.a.) This assignment did not include preparation of Location Notices and as a result this detail was assigned to "Fuze" Nance. (Personal communication with Wade Pearson April, 1989)

For reasons unknown to me, the map I prepared for New Era Mining Company was not adopted. The claim layout system designed and used by Nance consisted of 4 unnumbered claim groups. (See copy of "Fuz" Nance map in Appendix). One unnamed claim group is located in the SE $\frac{1}{4}$  Sec. 21, SW $\frac{1}{4}$  Sec. 22, NW $\frac{1}{4}$  Sec. 27 & NE $\frac{1}{4}$  Sec. 28 and shown as 1 to 25. Another group located in the N $\frac{1}{2}$ , Sec. 21 and numbered 1 to 23. Another group located in the S $\frac{1}{2}$ , Sec 28 and numbered 1 to 21. The last group is located in the N $\frac{1}{2}$ ,

Sec. 29 and numbered 1 to 27. In addition to this confusing practice it should be noted that nine six hundred foot wide claims total 5,400 feet cannot be compressed into a Section scaled at 5,280 feet in width. Also five claims in the central area are reduced by an unspecified width to fill a presumed fraction. It is my opinion that such procedures are not in compliance with legal or standard mining practices.

In addition to my field examination conducted for New Era Mining Company in 1982 I visited the property in June, 1973 for LeRoy Condie, who at that time resided at 3604 Colonial Avenue, Los Angeles, California. During that examination I was assigned to prepare a claim map showing the position of two unpatented lode claims called June and June No.1. (See Condie map CY-2 in Appendix) During this visit I was accompanied by LeRoy Condie who informed me that ASARCO ( American Smelting and Refining Company) sank a shaft approximately 85' on a suspected REO vein structure. Condie stated that this work was performed in the late 1940's and ASARCO's reason for abandoning the project was unknown to him. There are two shallow shafts, one ±85' shaft, one collapsed adit and several surface cuts in the project area. Workings other than the ±85' shaft, may or may not be, attributable to ASARCO. Several old access roads, dozer cuts and drill pads attest to past exploratory work.

On April 24, 1989.

Wade Conley arrived in Salt Lake City to examine my equipment and qualifications preparatory to authorizing me to provide geological services to a pending organization composed of Wade Conley, James Bland and others not disclosed at that time. During this meeting Wade Conley informed me that his pending organization had staked and filed Location Notices for 121 lode mining claims called IMPER-EX covering ground shown on the New Era Mining Company map prepared by me.(Map NEM-1 no longer available but similar to map JB-1 in Appendix) I was also informed by Wade Conley that there were an additional 25 Imper-Ex claims somewhere in this area. At this time it was Wade Conley thought these additional claims were located in the northwest area of the New Era claims.

On April 27, 1989.

I revised the New Era claim map NEM-1 for use by the now named James Bland Exploration. Some time between the above dates I received a request from James Bland to rename the Imper-Ex claims to Blandsell claims. During my telephone conversation with James Bland I discovered that the Imper-Ex Location Notices were filed with the Bureau of Land Management (B.L.M.) in Phoenix, Arizona but not filed with the County Recorder in Kingman Arizona and that there was some question as to the claim description accuracy. As a result of this conversation I

requested copies of the original Imper-Ex Location Notices but did not receive them until May 16, 1989.

On April 28, 1989.

At the request of James Bland, I submitted a Budget Proposal (See copy in Appendix) for recommended exploration work on the Mesquite Project. This proposal was never approved or funded, and as a result, not initiated. This Proposal was submitted on the basis of 121 claims legally located and properly filled with appropriate agencies and that no claim staking and filing would be required.

After receiving and reviewing Imper-Ex notices I concluded that there were many serious errors incorporated into this phase of claim activity such as:

1. Not filed with the County Recorder in Kingman.
2. No discovery posts or corner posts erected.
3. No Location Notices posted on the claims.
4. Discovery monuments stated to be in or on corners.
5. 25 Imper-Ex claim overlap other Imper-Ex claims.
6. 121 Location Notices for 96 claims.
7. Error in description of Imper-Ex No.1 used as tie-in.
8. No valid discoveries made on each claim.
9. References to New Era not known to investigators.
10. B.L.M. complaint (921SR) 0012M A MC 293570 3/29/89
11. 121 claim located in one day is subject to question

On receiving the 120 (One notice was missing) Imper-Ex Location Notices May 16, 1989 I discussed the seriousness of the situation with James Bland on the telephone and at that time I recommended that the Imper-Ex claim activity be terminated and new location notices, accompanied by a 500 scale map, be prepared for a more professional attempt at locating claims in the Mesquite area. Amending the Imper-Ex notices was suggested by James Bland, however, due to the excessive errors incorporated into the original filings I was able to dissuade moving in this direction.

During this phase of examination I contacted the B.L.M. Mining Claims Section, by phone in Phoenix, to clarify statements made to James Bland by an agent of this office. I concluded that there was some degree of misunderstanding between James Bland and the B.L.M. Resolving this issue unquestionably required starting over and proceeding in a more precise and professional manner.

For this phase of work I received from James Bland a check in the amount of \$300.00 for drafting map JB-1 and completing 117 Blandsell Location Notices. Both of which were never used.

On May 26, 1989.



I received a telephone request from James Bland to add 24 Blandsell claims in the northwest area. This assignment required additional map drafting to revise map JB-1 and completion of 24 more Blandsell Location Notices. This request was complied with promptly.

On May 30, 31 and June 1, 1989.

I met with Wade Conley, James Bland and Rick Wiggins to discuss the proposed exploration work for the Mesquite area and at that time I received 4 personnel check totalling \$10,000.00. This amount was deposited in Zions First National Bank, in Salt Lake City, under a DBA of Blandex on June 2, 1989. Account number is 17-34397-1 and has a balance, as of report date, of \$803.54 less monthly maintenance fee. This amount is insufficient to cover outstanding amounts past due which total \$3,364.25.

From June 4 to June 8, 1989.

I traveled to Mesquite for on site field work and met with Wade Conley, James Bland and James Francis. A field crew consisting of one geologist and one geological assistant performed work consisted of one day orientation for the group after which we spent one day sampling and one day completing a reconnaissance, returning to Salt Lake City on June 8, 1989 for a total of 5 days equaling 10 man days.

During this phase of field work 36 samples were cut at intervals of 100 feet across an altered zone to explore for potential gold mineralization. (See sample location map in Appendix) While this area was located outside the planned claims boundary I considered it necessary to evaluate this suspected zone in the event results were positive for gold mineralization which would require extending the claims area northeasterly. Assay results were negative for gold but anomalous in silver. This area needs further attention, on a lower priority, during on-going field activities.

On June 9, 1989.

I took 36 samples to Rocky Mountain Geochemical Company for gold assays (See R.M.G.C. Certificate of Analysis results dated June 20, 1989) (Note that the Rothbard sample is not part of this project) Results of gold analysis from this study were subject to question and as a result I submitted 5 pulps from 890031,32,34 & 36 to Assay Lab for gold analysis and received identical results verifying R.M.G.C's assay report.

The term pulp refers to a sample prepared for assay but not entirely used for assaying. This process allows convenience in filing and recovery at a later date for additional assaying or verification.

After discussing with James Bland my reconnaissance findings in the west area I reduced the number of claims needed at the present time from 117 to 29. These 29 claims were to be placed

in a location referred to as the ASARCO area. This decision required redrafting a new 500 scale map and preparing new Location Notices. Map JB-2 shows an incorrect date of May 23, 1989 and should show a date of June 9, 1989. This date will remain due to the map used for filing the 29 Blandsell claims. Altering this date would require filing an amendment, which is unnecessary.

From June 16 to June 20, 1989.

I traveled to Mesquite to start Blandsell claim location work. A two man field crew consisting of Joseph and Joseph E. Owens located two section corners and established a north-south base line from which to turn 90° claim angles. During this phase of work a Gurley alidade, plane table, Johnson head tripod and leveling rod was used. Due to the lack of back site capabilities ascribed to an alidade this method was discontinued and a Pentax TH-10D (Electronic Theodolite) introduced to continue the claim survey work. All post positions are shot in with a TH-10D using a leveling rod were practical. To avoid unnecessary expenditures of time and money control points were established on exposed slopes and a hip chain used to measure back to required post location points. This method eliminated accumulated distance errors and requires less instrument moves. Alignment is not affected by this technique. While a survey of claim posts is not required §3833.1-2(ii) (See copy of regulation in Appendix) states that some degree of accuracy is required. It has long been my policy not to locate mining claims using a technique known as "Brunton and Pace". This method incorporates an inverted observation using a Brunton compass for alignment and uncorrected pacing to establish distance. This method is highly inaccurate and varies depending on individual performance. Frequently the "authorized officer of the agency administering the lands etc" is unable to duplicate the alignment and distance when Brunton and Pace is used and often arrives at the conclusion that the locator has floating claims. (Illegal claims with ambiguous descriptions capable of appearing conveniently to suite the locators changing needs)

All location monument lines were surveyed during this phase of field work. Discovery monuments are set 50 feet from end lines as stated on Location Notices. Location Notices were posted in 1½ inch Grey P.V.C. posts 5 feet in length and were set by J.E.Owens during a 3 day period. Corner and end center posts are identical to Location Monument posts. A total of 13 man days were expended during this activity.

On June 23, 1989.

Nine petrographic samples taken from the ASARCO shaft area were cut, ground and polished for thin section studies. A preliminary microscopic examination was initiated and will be completed

when REO assays are received. Assay results are expected to assist in identification of several unknown minerals appearing in thin sections. Final petrographic reports will be completed at a later date.

Also on this date 5 samples (89001, 890016, 890037, 890038 & 890039) were Expressed to Chemex Labs in Reno, Nevada for REO assays. (See copy of Chemex form in Appendix) According to Chemex Labs REO analyses require 8 weeks to process. (Personal communication with Steve Bartlett at Chemex Labs 702 356-5395)

Results of the 5 REO examinations should be available sometime in late August, 1989.

Due to this excessive delay in assaying REO samples another Lab was contacted having a more realistic turnaround of 5 to 7 days. This Lab in Denver ( Skyline Labs, 303 424-7718) should be given consideration for future REO assay work.

From July 11 to July 16, 1989.

I traveled to Mesquite for continuation work surveying in post positions on end lines. Wade Conley and James Bland were on site to examine equipment used and observe survey work. During this phase of field work the north end line post positions were surveyed and marked with pin flagging in addition to the center end line, also pin flagged. One set point was established and pin flagged at the common corner between Blandsell No.1 and Blandsell No.2. This point also marks the south boundary line of the 29 Blandsell claim block.

There are 10 post positions remaining to be set before south boundary posts can be erected. Survey work on the south boundary was not completed due to lack of time allocated for survey activities in steep and heavily timbered topography.

A total of 108 posts are required to complete the staking activities which must be completed on or before September 5 and 6, 1989. This split date is due to Blandsell 1 to 14 located June 5, 1989 and Blandsell 15 to 29 located June 6, 1989. A total of 14 locations per day is more realistic than 121 locations per day. (See page 3, item 11.)

At the time of this writing (8/11/89) 98 out of 108 post positions are surveyed in. A remaining 10 south end line post positions need to be surveyed and pin flagged. Of the 108 posts required, 55 are completed, leaving 53 to be set in position.

As of report date this project has consumed 33 man days of

field work and 13 days of office work. Calls not included. Completion of this staking work will require a field crew of two men for 3 days at a cost of \$1,200.00. If not completed by dates stated above the entire staking efforts will be subject to challenge and not defensible. (See copy of Arizona Revised Statutes -Annotated (1976) Revised through 1980 Session Laws §27-203 A 2.)

#### TITLE SEARCH

April 6, 1989.

On this date Joseph E. Owens (Geological Technician) traveled from Yuma to Phoenix, Arizona to conduct a title search in Range 16 West, Townships 37 and 38 north. The objective was to determine claim filing activity. This examination shows that the LaStella, Beauchamp, Pearson and Nance (New Era) holdings were closed by the B.L.M. in 1984 and 1985. No additional filings are shown on the microfich card No.029 as of B.L.M. report dated April 6, 1989. Emper-Ex locations are recorded but will be eventually closed by the B.L.M.

#### RECORDATION

Documentation required to fulfill the act of locating lode mining claims, in the State of Arizona on B.L.M. administered lands, is completed as of this report date. It is extremely important to comply with Federal Land Policy and Management Act of 1976 (Public Law 94-579 Stat.2743) Sec. 314 (a) requiring owners of mining claims to file for record a Notice of Intent to Hold mining claims or Affidavit of Assessment Work prior to December 31 of each year. Failure to comply with this regulation will be deemed by the B.L.M. as prima facie evidence of abandonment and your claims will be declared null and void.

Copies of United States Postal Service receipts are included in the Appendix to show that documents were filed with appropriate agencies. Recordation data performed by the Mohave County Recorder is confirmed. Proof of recordation by the B.L.M. is not confirmed as of this report date. Instructions provided on Blandsell claim notices clearly instruct recorders (See §12 on Notice copies) where to return recordation data. The B.L.M. apparently saw fit to ignore these instructions and mailed the recordation receipts to James Bland. Repeated requests, made by me to James Bland for a copy of the recordation receipt, were unsuccessful and as a result this phase of documentary proof is incomplete. During one of my telephone conversations with James Bland he informed me that the A MC numbers for Blandsell claims were 297120 to 297148. Apparently any communication with the B.L.M. relative to Blandsell claims will require using a lead number of 297120.

## RECOMMENDATIONS

While the Mesquite area is not extensively known for its potential as a Rare Earth Oxide (REO) district sufficient interest is attested to by existing abandoned workings, access roads and abandoned drill sites. It is my opinion, and the opinion several investigators who have examined this area, that a detailed geological examination is warranted. (Personal communication with Einar C. Erickson, Geologist, Hurricane, Utah and Wade Pearson, Mining Engineer, Salt Lake City, Utah.)

Rock types in the immediate area of interest consist of Gneissoid Leucogranite, considered by some investigators to be true intrusives, considered by this investigator to be of a migmatic rather than magmatic origin, schists, gneisses, limestones and dolomites. These rocks date from Precambrian, with some Ordovician sediments, through Devonian-Mississippian limestones to Pennsylvanian-Permian sediments.

Vertical bedding is dominant in the central and northern areas with complex folding and reverse faulting evident. At least one major north-south fault system passes through this area on the east side, between the low rolling foothills composed of Precambrian rocks, and massive limestone cliffs to the east.

Alteration in the form of bleaching appears to be both stratigraphically and structurally controlled. One of these zones was sampled for gold and showed anomalous in silver but less than background in gold. These results are indicative of solution bleaching and moving or remobilizing mineralization.

Detailed geological mapping and sampling of this area with results plotted on a control base map or aerial photographs will be necessary for future exploratory work. Once mineralization trends are established an intensive surface sampling effort should be undertaken followed by drill site preparation and finally drilling.

All exploratory work should be phased in order to provide adequate time to process, analyse and report data necessary in management making decisions. Included in the Appendix is a sample copy of a recommended exploration and development flow diagram commonly used in the mining industry.

Since much of the field work accomplished to date was directed to solving claim discrepancies very little attention was devoted to geological investigations. However, it is my opinion and recommendation that immediately upon completion of location work a planned program of detailed geological testing begin.

**COMPLETION OF LOCATION FUNDING**

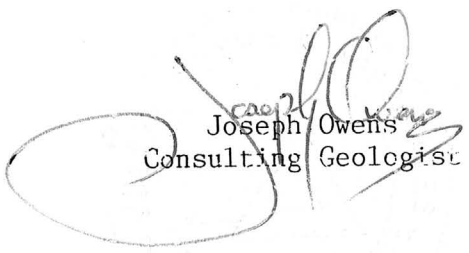
1. Pay outstanding costs past due	\$3,364.25
2. Fund completion of location work	<u>1,200.00</u>
Sub Total	\$4,564.25

**PROPOSED BUDGET FOR EXPLORATION PHASE ONE**

1. Aerial Photography	\$1,900.00
2. Assays	2,000.00
3. Field work, 5 days	1,000.00
4. Travel	300.00
5. Motel and meals	400.00
6. Data reduction and report	<u>560.00</u>
Sub Total	\$8,860.00

**Total \$13,424.25**

This report was prepared by Joseph Owens and submitted on the  
11 day of August, 1989.

  
Joseph Owens  
Consulting Geologist

**SENDER: Complete Items 1 and 2 when additional services are desired, and complete items 3 and 4.**  
 Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.

1.  Show to whom delivered, date, and addressee's address. (Extra charge)      2.  Restricted Delivery (Extra charge)

<p>3. Article Addressed to:</p> <p><b>BUREAU of LAND MANAGEMENT</b>        Mining Claims Section.        P.O.Box 16563        Phoenix, Arizona 85011</p>	<p>4. Article Number  <i>P126 609 106</i></p> <p>Type of Service:  <input type="checkbox"/> Registered      <input type="checkbox"/> Insured  <input checked="" type="checkbox"/> Certified      <input type="checkbox"/> COD  <input checked="" type="checkbox"/> Express Mail      <input type="checkbox"/> Return Receipt for Merchandise</p> <p>Always obtain signature of addressee or agent and <b>DATE DELIVERED.</b></p>
<p>5. Signature - Address        X</p>	<p>8. Addressee's Address (ONLY if requested and fee paid)</p>
<p>6. Signature - Agent        X <i>Lynnda Jantegler</i></p>	
<p>7. Date of Delivery  <i>JUL 12 1989</i></p>	

PS Form 3811, Mar. 1988 \* U.S.G.P.O. 1988-212-865 **DOMESTIC RETURN RECEIPT**

**SENDER: Complete Items 1 and 2 when additional services are desired, and complete items 3 and 4.**  
 Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.

1.  Show to whom delivered, date, and addressee's address. (Extra charge)      2.  Restricted Delivery (Extra charge)

<p>3. Article Addressed to:</p> <p><i>COUNTY RECORDER</i>  <i>P.O. Box 70</i>  <i>KINGMAN, ARIZONA</i>  <i>86402</i></p>	<p>4. Article Number  <i>P126 605 336</i></p> <p>Type of Service:  <input type="checkbox"/> Registered      <input type="checkbox"/> Insured  <input type="checkbox"/> Certified      <input type="checkbox"/> COD  <input type="checkbox"/> Express Mail      <input type="checkbox"/> Return Receipt for Merchandise</p> <p>Always obtain signature of addressee or agent and <b>DATE DELIVERED.</b></p>
<p>5. Signature - Address        X</p>	<p>8. Addressee's Address (ONLY if requested and fee paid)</p>
<p>6. Signature - Agent        X <i>Betty Moore</i></p>	<p><i>JUN 19 1989</i>        KINGMAN, ARIZONA        USPS</p>
<p>7. Date of Delivery  <i>6/19/89</i></p>	

PS Form 3811, Mar. 1988 \* U.S.G.P.O. 1988-212-865 **DOMESTIC RETURN RECEIPT**

**ARIZONA REVISED STATUTES**  
— ANNOTATED (1976)  
revised through 1980 Session Laws

Arizona

49

**§ 27-203. Completing lode placer or millsite locations; recording location notice; monumenting; map; plat or sketch requirements; abandonment of claims; recorder duties and fees.**

A. The locator of a lode, placer or millsite claim shall:

1. Cause to be recorded in the office of the county recorder of the county in which the claim is located an executed copy of the location notice to which notice shall be attached a map, plat or sketch of the claim, within ninety days from the time of the location. If the posted notice of location does not contain the section, township and range in which the notice is posted such information shall be added to the notice prior to recording pursuant to this section if the land has been surveyed. If the land has not been surveyed, the locator shall identify to the best of his ability the projected, protracted or extended section, township and range in which the notice of location of the claim is posted.

2. Monument the claim on the ground within ninety days from the time of the location so that its boundaries can be readily traced.

B. The map, plat or sketch required by subsection A shall be:

1. In legible form and not more than eight and one-half inches by fourteen inches.

2. On a scale of one inch equals not more than two thousand feet.

3. Based upon the performance of a survey performed commensurate with the abilities of the locator. It shall set forth the boundaries and position of the claim with such accuracy as would permit a reasonably knowledgeable person to find and identify the claim on the ground. The locator may show contiguous claims on the map, plat or sketch if the claim being located is clearly identified. Nothing contained in this section shall require a locator to employ a professional surveyor or engineer for the preparation of the map, plat or sketch required by this section.

C. The plat or map of any claim shall contain the following information:

1. The name of the claim.

2. Whether the claim is a lode, placer or millsite claim.

3. The locality of the claim with reference to the section, township and range in which the claim is located with a course and distance tie from a corner of the claim or contiguous group of claims to a monument of the public land survey if the land has been surveyed. If the land has not been surveyed, a corner of the claim or claim group shall be tied by course and distance to an established survey monument of a United States government agency or United States mineral monument. If no such monument can be found through the exercise of reasonable diligence, the map shall

AZ





# United States Department of the Interior



BUREAU OF LAND MANAGEMENT  
ARIZONA STATE OFFICE  
3707 N. 7TH STREET  
PHOENIX, ARIZONA 85014

IN REPLY REFER TO:

(921SR)  
0012M  
A MC 293570

(602) 241-5550

March 29, 1989

James Bland  
2132 Willow Lane  
Austell, GA 30001

The regulations in 43 CFR 3833.1-2(b)(5)(i) require that a legal description shall be furnished for all claims or sites located on surveyed or unsurveyed lands. The description should include the township, range, and section and the location of each claim within a 160-acre quadrant of a section (quarter section). Please provide this information so we may properly note our records for

X In processing your claims we find that the description shown on the map and that given on the location notice do not agree. Please verify the correct description so we may properly note our records for: A MC 293606 IMPER-EX No. 12.

The notice states the claim is in sec. 28 and sec. 29 for the location; however, the map depicts sec. 28. A MC 293622 IMPER-EX No. 29. The notice states the claim is in sec. 28 and sec. 29 for location; however, the map depicts sec. 28. APMC 293655 IMPER-EX No. 62. The notice states the claim is in sec. 21 for location; however, the map depicts the sec. 21 and sec. 20. A MC 293681 IMPER-EX No. 88. The notice states the claim is in sec. 21 for location, however, the map depicts sec. 20 and sec. 21. We have entered the descriptions according to the maps into our records.

You may want to amend your mining claims to protect your rights. Amendments to previously recorded notices of location shall be accompanied by a nonrefundable service charge of \$5 for each claim. Amendments should also be recorded with the County Recorder's Office.

Please include your A MC serial numbers on all correspondence.

Sincerely,

Alan Rabinoff  
Acting Chief, Branch of  
Mining Law Administration



# ROCKY MOUNTAIN GEOCHEMICAL CORP.

## Certificate of Analysis

SALT LAKE  
BUSINESS LOCATION:  
1323 WEST 7900 SOUTH  
WEST JORDAN, UTAH 84084  
PHONE: (801) 255-3558

Page 1 of 2

DATE: JUNE 9, 1989

RMGC JOB NO: 89-24-04

CLIENT: Owens, Joseph & Assoc.  
4727 Fairfield Road  
Salt Lake City, Ut 84124

INVOICE NO.: 10786

ATTN:

CLIENT ORDER NO.:

REPORT ON: 9 Rock Samples

SUBMITTED BY: Joseph Owens

DATE RECEIVED: MAY 26, 1989

ANALYSIS: Gold, Gold Fire

ANALYTICAL METHODS: Determined by atomic absorption and by one ton fire assay.

REMARKS:

CC: enc.  
file  
GJC/lw

All values are reported in parts per million unless specified otherwise. A minus sign (-) is to be read "less than" and a plus sign (+) "greater than." Values in parenthesis are estimates. This analytical report is the confidential property of the above mentioned client and for the protection of this client and ourselves we reserve the right to forbid publication or reproduction of this report or any part thereof without written permission.

ND=None Detected

1 ppm=0.0001%

1 Troy oz./ton=34.286 ppm

1 ppm=0.0292 Troy oz./ton

Buyer agrees to pay collection costs including reasonable attorney's fees and court costs and interest at the maximum legal rate in the event of default

Client: Owens, Joseph & Assoc.

Date: JUNE 20, 1989

RMGC Job No.: 89-28-06

Page 2 of 3

SAMPLE NO.	Gold ppm
890001	-0.04
890002	-0.04
890003	-0.04
890004	-0.04
890005	-0.04
890006	-0.04
890007	-0.04
890008	-0.04
890009	-0.04
890010	-0.04
890011	-0.04
890012	-0.04
890013	-0.04
890014	-0.04
890015	-0.04
890016	-0.04
890017	-0.04
890018	-0.04
890019	-0.04
890020	-0.04
890021	-0.04
890022	-0.04
890023	-0.04
890024	-0.04
890025	-0.04



**ROCKY MOUNTAIN GEOCHEMICAL CORP.**

Client: Owens, Joseph & Assoc.

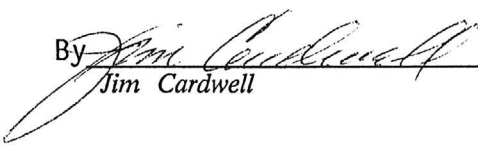
Date: JUNE 20, 1989

RMGC Job No.: 89-28-06

Page 3 of 3

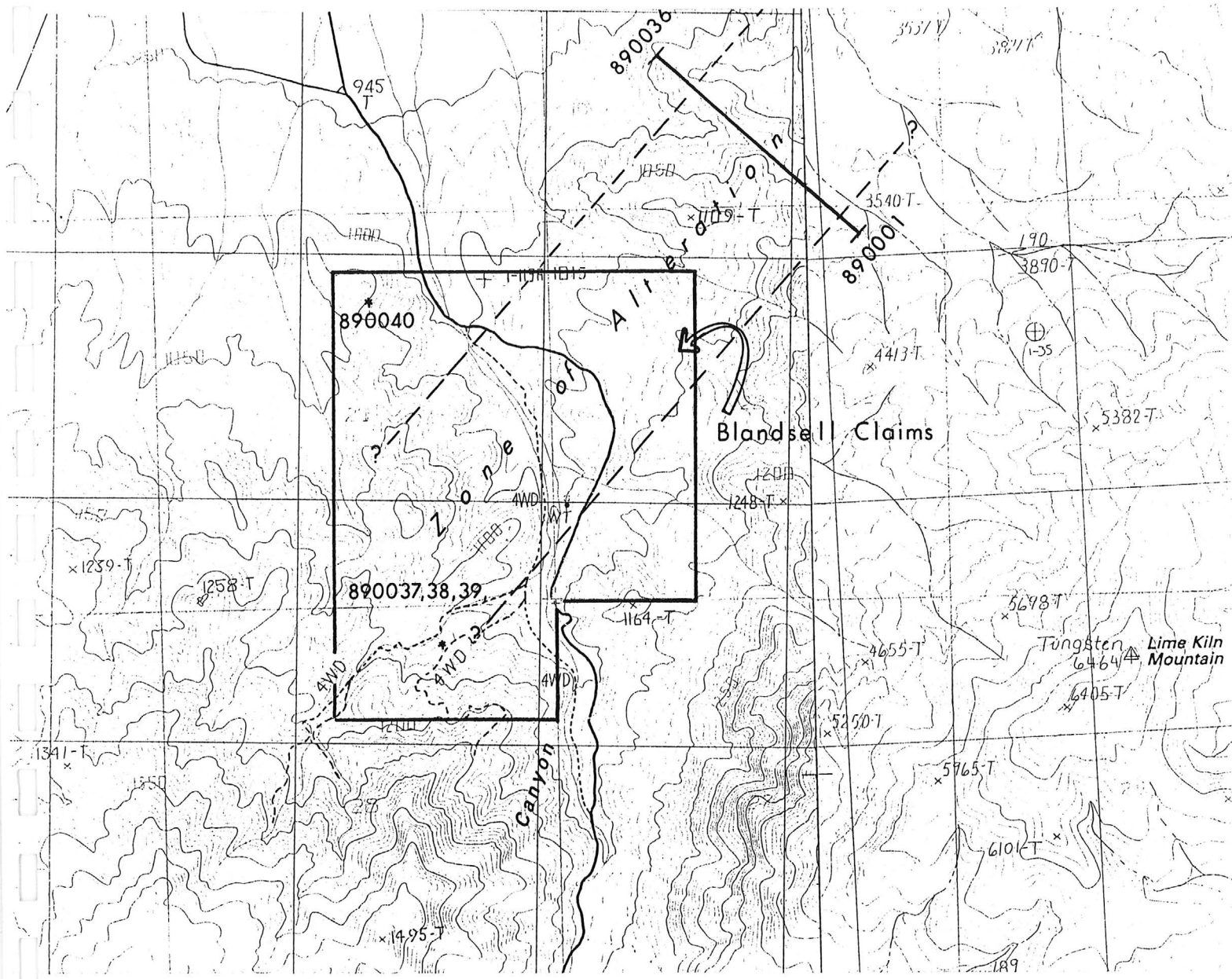
SAMPLE NO.	Gold ppm
890026	-0.04
890027	-0.04
890028	-0.04
890029	-0.04
890030	-0.04
890031	-0.04
890032	-0.04
890033	-0.04
890034	-0.04
890035	-0.04
890036	-0.04
Rothbard	-0.04

By

  
Jim Cardwell



ROCKY MOUNTAIN GEOCHEMICAL CORP.



S A M P L E M A P

Showing position of claim block, Alteration Zone and locations of samples numbered 890001 to 890040

Not to scale-For illustration purposes only

# BLANDEX HERCULES MINING CO.

Date June 5-8 1989

## SAMPLE LOG

Page 1 of 2

SAMPLE	Troy ozs/Ton		CLAIM	SAMPLE		DESCRIPTION
	Au	Ag		Type	Thick.	
	PPM					FIRST RIDGE
						JUNE 5-8 1989 MESSITE - J. BLAND
890001	<.04	—	N/A	GRAB	—	GNEISS - DL GRN TO MOTT. QUARTZ STINGS. RED
890002		—	"	"	"	" " " " " "
890003		"	"	"	"	" " " " " "
890004		"	"	"	"	" " " " " "
890005		"	"	"	"	GNEISS, PINKISH LASS QTZ FLEXIBLE
890006		"	"	"	"	" " " " " "
890007		"	"	"	"	GNEISS - ALTERED - WHITEISH - FLEXIBLE 1/4 QTZ
890008		"	"	"	"	GNEISS - GREENISH - SOME QTZ -
890009		"	"	"	"	GNEISS - PINKISH - SOME S 5 NET NO QTZ
890010		"	"	"	"	GNEISS - GRY/GRN - SOME QTZ INC IN BIO.
890011		"	"	"	"	GNEISS - " " " BIO & HORN
890012		"	"	"	"	GNEISS (Pink Fody) SOME QTZ
890013		"	"	"	"	" " " " " "
890014		"	"	"	"	" " " " " "
890015		"	"	"	"	GNEISS - WHITEISH - SOME QTZ
890016		"	"	"	"	GNEISS - GREENISH (SAME AS 0001) RED
890017		"	"	"	"	GNEISS - DL GRN - FLEXIBLE
890018		"	"	"	"	GNEISS - PINK - MOTTLED - GRN BLOBS - SOME QTZ
890019		"	"	"	"	GNEISS - PINK GRANITIC LOOK
890020		"	"	"	"	" " " " " "
890021		"	"	"	"	GNEISS - GRAY QTZ STR LT GRN
890022		"	"	"	"	GNEISS - PINK GRANITIC LOOK - SAME AS 19
890023		"	"	"	"	GNEISS - WHITE - FLEXIBLE - LOW QTZ
890024		"	"	"	"	" " " " " "
890025		"	"	"	"	SCHIST - FeO <sub>3</sub> - DL GRN.
890026		"	"	"	"	GNEISS - GRANITIC LOOKING - AUGURS - FeO <sub>3</sub> - QTZ
890027		"	"	"	"	GNEISS - BW MOTTLED - LOOKING LIKE A MONZONITE
890028		"	"	"	"	GNEISS - DL GRN - QTZ STR. LIGHT 1
890029		"	"	"	"	GNEISS - DL GRN - FeO <sub>3</sub> - QTZ
890030		"	"	"	"	GNEISS - DL GRN - BIO - " " " " " ? ABOVE
* 890031	.005	.05	"	"	"	GNEISS - GRN LING. MOTTLED - FeO <sub>3</sub> - MAG -
* 890032		"	"	"	"	" " " " " " " " " " " "
890033		"	"	"	"	" " " " " " " " " " " "
890034	.005	.28	"	"	"	GNEISS - SIG. FeO <sub>3</sub> - QTZ MAG. STEINHAUS
890035		"	"	"	"	HORNBLAND - BIO - SCHIST



# ASSAY REPORT SHEET

**ASSAY LAB, INC.**  
1376 W. 8040 So. Unit #4  
West Jordan, Utah 84084

Date Received \_\_\_\_\_

Date Reported 6/29/89

Client Joe Owens

Sample Identification	Oz/Ton Au	Oz/Ton Ag	Remarks
			* Ounces per ton of 2000 lbs.
#890036	<.005	<.05	
#890034	<.005	.28	
#890031	<.005	<.05	
#890032	<.005	<.05	
Joe Owens	.005	.11	
#890037	<.005	.20	

*Ronald  
Branch*





STATE OF ARIZONA,

County of \_\_\_\_\_

} ss.

I hereby certify that the within instrument was filed and recorded

Fee No.:

In Docket No. \_\_\_\_\_

Page \_\_\_\_\_

, 19\_\_\_\_, at \_\_\_\_\_ M.

, at the request of \_\_\_\_\_

When recorded mail to:

Furn. NARIBB  
10 Box 829  
Hurricane AZ 84737

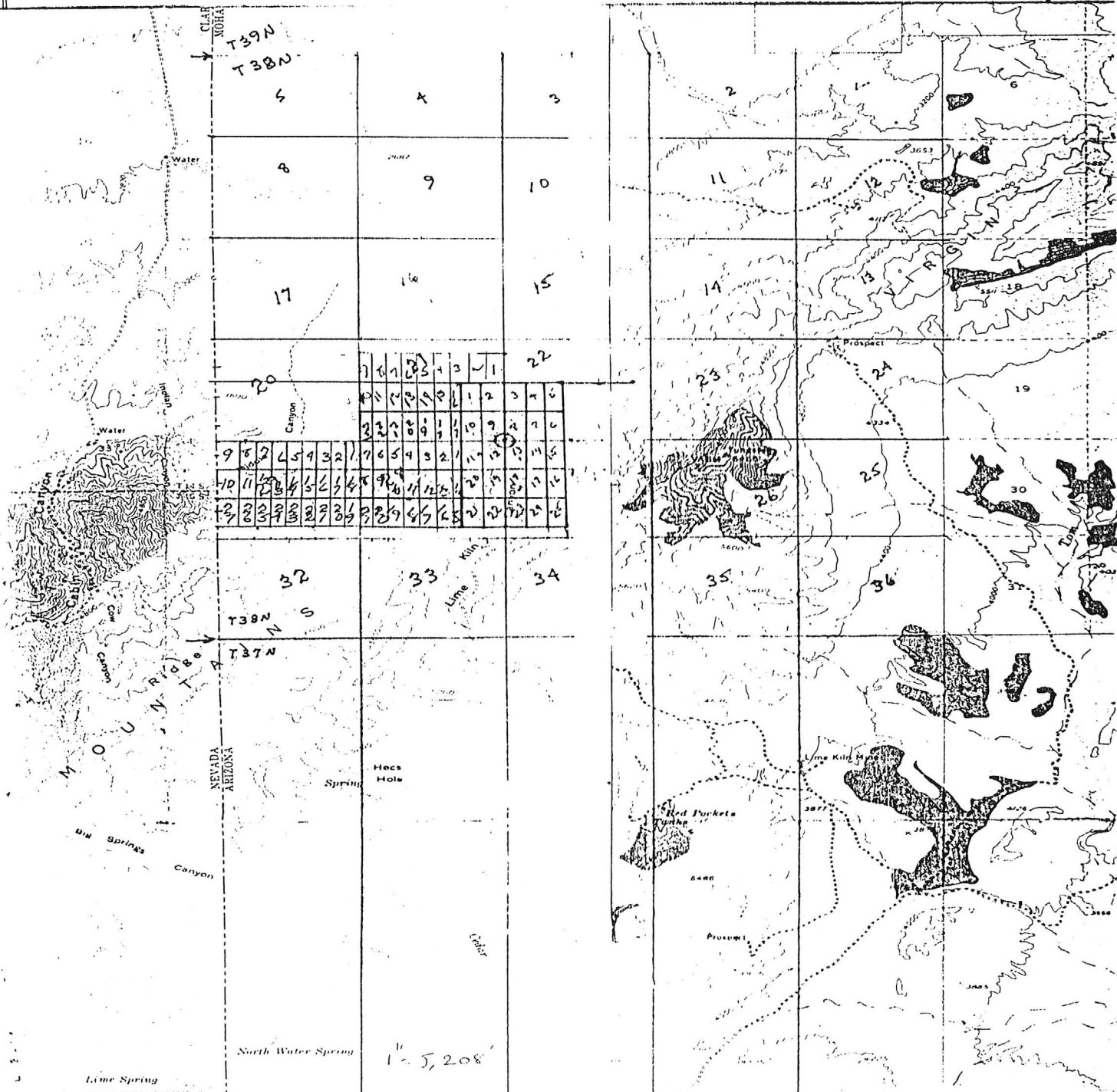
Witness my hand and official seal.

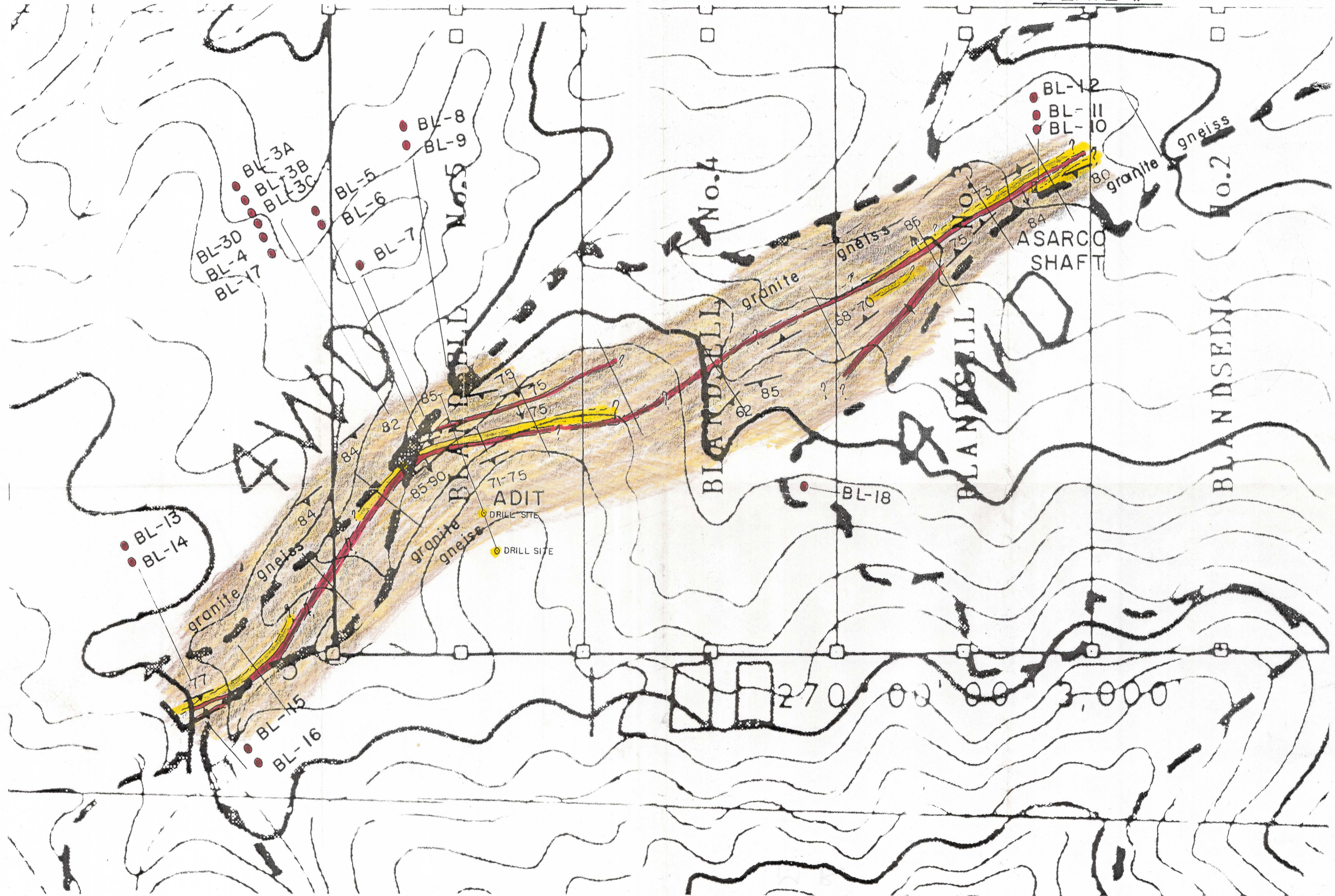
County Recorder

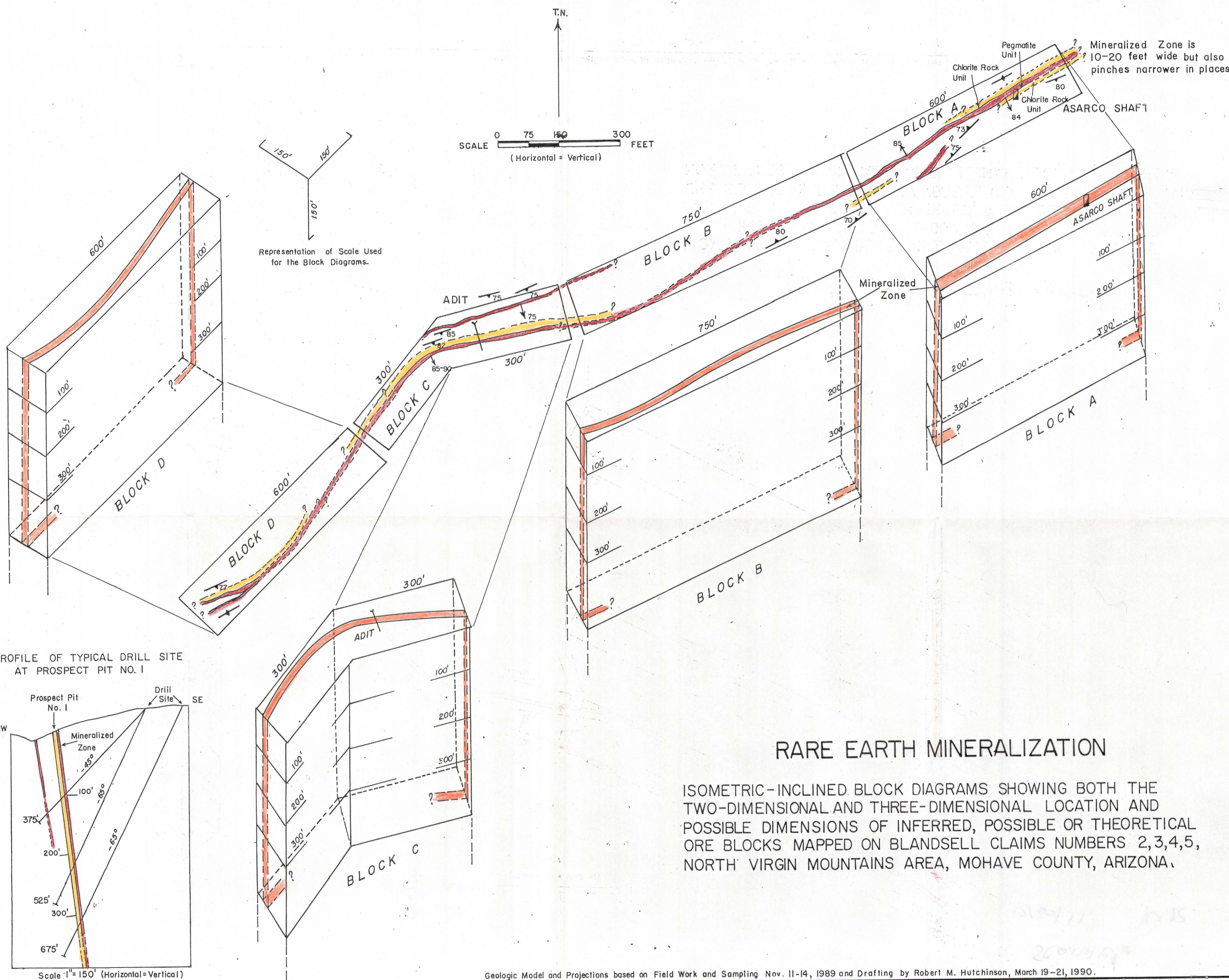
Fee: \$

By \_\_\_\_\_

Deputy Recorder







### RARE EARTH MINERALIZATION

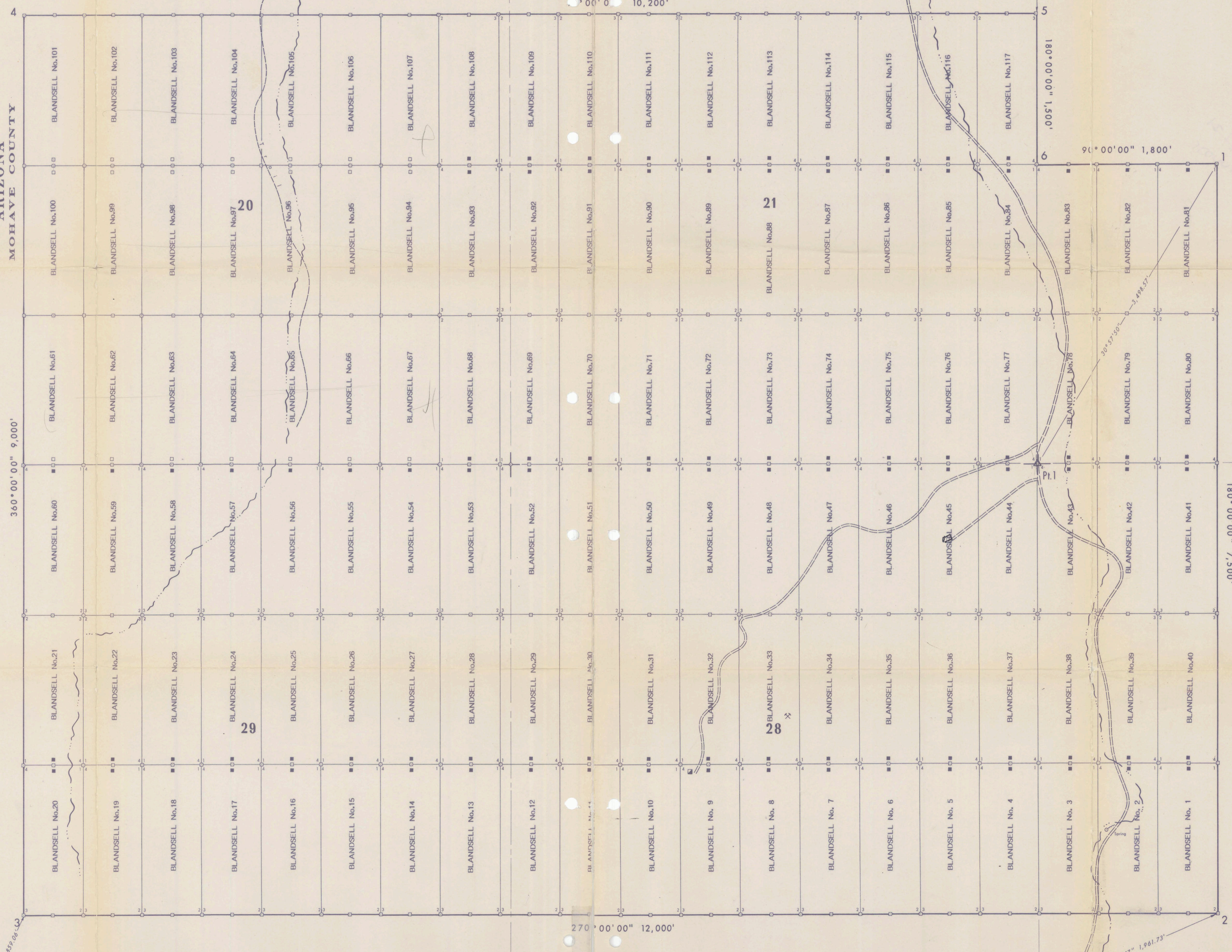
ISOMETRIC-INCLINED BLOCK DIAGRAMS SHOWING BOTH THE TWO-DIMENSIONAL AND THREE-DIMENSIONAL LOCATION AND POSSIBLE DIMENSIONS OF INFERRED, POSSIBLE OR THEORETICAL ORE BLOCKS MAPPED ON BLANSELL CLAIMS NUMBERS 2,3,4,5, NORTH VIRGIN MOUNTAINS AREA, MOHAVE COUNTY, ARIZONA.

R. 71 E.

R. 16 W.

NEVADA  
CLARK COUNTY  
ARIZONA  
MOHAVE COUNTY

28 27  
33 34  
T. 14S.  
T. 15S.

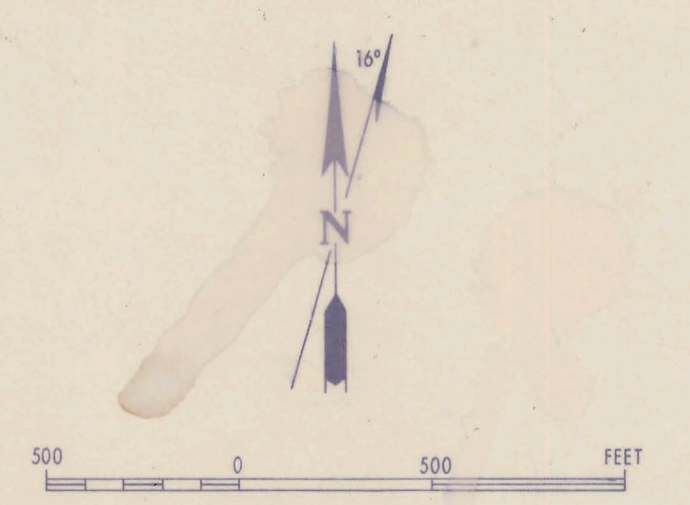


EXPLANATION

- △ Pi. 1 Primary Control Point
- ⊕ Section Corner
- Corner or End Center Post
- Location Monument
- ⋈ Prospect Pit
- Mine Shaft
- Spring

CLAIMS SHOWN ON THIS MAP ARE OWNED BY:  
JAMES BLAND  
2132 Willow Lane  
Austell, Georgia 30001

NOTE:  
All lode claims are 1500' x 600' and 20.66 acres each



**James Bland**  
2132 Willow Lane, Austell, Georgia 30001

Property Map  
NORTH VIRGIN MOUNTAINS AREA

MOHAVE COUNTY ARIZONA

Scale 1" = 500' Date July 13, 1982

JOSEPH OWENS  
CONSULTING GEOLOGIST  
SALT LAKE CITY UTAH

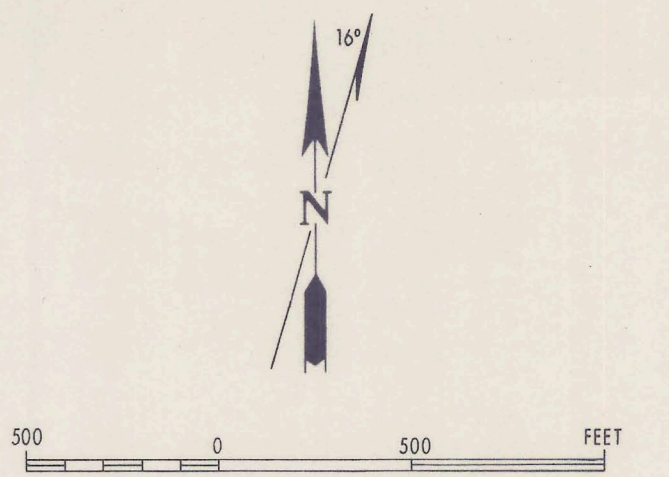
**JB-1**  
Revised April 27, 1989

EXPLANATION

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- Spring

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NOTE: All lode claims are 1500' x 600' and 20.66 acres each



**James Bland**  
 2132 Willow Lane, Austell, Georgia 30001

Property Map  
 NORTH VIRGIN MOUNTAINS AREA

MOHAVE COUNTY ARIZONA

Scale 1" = 500' Date May 23, 1989

JOSEPH OWENS  
 CONSULTING GEOLOGIST  
 SALT LAKE CITY UTAH

JB-1



T. 14S.  
 T. 15S.

22

27

T. 38 N.

R. 71E.

R. 16 W.

27

19

30

20

29

21

28

NEVADA  
 CLARK COUNTY  
 ARIZONA  
 MOHAVE COUNTY

Indian Canyon

Middle Creek

BLANDSELL No. 101

BLANDSELL No. 102

BLANDSELL No. 103

BLANDSELL No. 104

BLANDSELL No. 105

BLANDSELL No. 106

BLANDSELL No. 107

BLANDSELL No. 108

BLANDSELL No. 109

BLANDSELL No. 110

BLANDSELL No. 111

BLANDSELL No. 112

BLANDSELL No. 113

BLANDSELL No. 114

BLANDSELL No. 115

BLANDSELL No. 116

BLANDSELL No. 117

BLANDSELL No. 99

BLANDSELL No. 98

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BLANDSELL No. 29

BLANDSELL No. 1

BLANDSELL No. 2

BLANDSELL No. 3

BLANDSELL No. 4

BLANDSELL No. 5

BLANDSELL No. 6

BLANDSELL No. 7

BLANDSELL No. 8

BLANDSELL No. 9