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## THE CANANEA CONSOLIDATED COPPER COMPANY, S. A.

CANANEA, SONORA, MEXICO.

COPIA

June 20, 1952

Mr. J. B. Knaebel, Manager  
New Mexico Operations  
Anaconda Copper Mining Co.  
Grants, N. M.

Dear Jack:

Many thanks for the copy of the Red Bluff report. Sorry it didn't turn out to be an important new area.

I greatly enjoyed visiting with Kelly and Blakeslee for a few minutes in Tucson after Barber's wedding. Art was too nervous to do much talking! You must have a great bunch of young fellows up there now.

With best regards,

Yours very truly,

*Roland B. Mulchay*  
Roland B. Mulchay

RBM/amb

# ANACONDA COPPER MINING COMPANY

## New Mexico Operations

Grants, New Mexico

June 3, 1952

Mr. Carl Larson  
Young Route  
Globe, Arizona

Dear Mr. Larson:

I regret to advise that our recent work on your property and surrounding localities failed to turn up any additional possibility which would justify any substantial commitments in future development by our Company at this time. This outcome was a great disappointment, as we were quite hopeful of getting sufficient encouragement in this ore to bring us into the district as your neighbor.

Our research department has recently completed some metallurgical tests on the bulk samples which we took from your stockpile last April with the following results:

### Head Assays:

	<u>% U<sub>3</sub>O<sub>8</sub></u>	<u>% V<sub>2</sub>O<sub>5</sub></u>	<u>% S</u>	<u>% SO<sub>4</sub>S</u>	<u>% CaO</u>	<u>% Insol</u>
Lot 23212 (Low grade broken ore near main cut.)	.054	nil	1.2	nil	.15	85.7
Lot 23213 (High grade stockpile)	.846	nil	2.7	nil	.05	84.1

Test for amenability to treatment by the caustic leach process to be used in the Bluewater plant near Grants, New Mexico:

### % U<sub>3</sub>O<sub>8</sub> Extracted from Ore

Lowgrade Lot 23212 - - - - - 48.1 %

Highgrade Lot 23213 - - - - - 40.8 %

Test for amenability to treatment by the acid leach method:

### % U<sub>3</sub>O<sub>8</sub> Extracted from Ore

Lowgrade Lot 23212 - - - - - 86.1 %

Highgrade Lot 23213 - - - - - 94.6 %

June 3, 1952

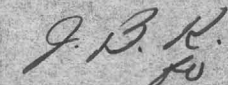
Obviously from the foregoing results these ores should be treated in a plant using the acid leach method. Although it is possible that our own plant near Bluewater may be modified or extended at some future time so as to enable it to handle ores of this type, our circuit now under construction will be unable to treat them with satisfactory recovery. It is my understanding that the officials of the Atomic Energy Commission feel that your ore should logically go to Salt Lake, or some other receiving station having facilities for treating ores of this type. I imagine you are closely in touch with the Atomic Energy Commission, and will receive the benefit of any help they can give you in obtaining more favorable freight rates than those quoted at the time of our visit to your property last April.

If we can be of any assistance to you at any time, please let us know. Since your developments seem to be opening up large tonnages of lowgrade ore, we will be interested in taking another look at your property at some future date if you care to have us do so.

It was a pleasure indeed to make the acquaintance of Mrs. Larson and yourself, and we look forward to meeting you at some future date.

Best wishes for every success with your property.

Sincerely yours,



J. B. Knaebel, Manager

JBK:fv

cc: Mr. E. F. Reed

Bcc: Mr. C. E. Weed  
Mr. C. H. Steele  
Mr. P. D. I. Honeyman  
Mr. Alex M. McDonald  
Mr. V. D. Perry  
Mr. R. B. Mulchay  
Mr. J. L. Kelly

# ANACONDA COPPER MINING COMPANY

New Mexico Operations

Grants, New Mexico  
June 3, 1952

Mr. C. H. Steele, General Manager  
Western Mining Operations  
Anaconda Copper Mining Company  
Hennessy Building  
Butte, Montana

Re: Red Bluff Prospect near Globe, Arizona

Dear Chester:

Herewith I enclose J. L. Kelly's report of May 27th on results of our recent examination of the Red Bluff uranium prospect and surrounding localities in Gila County, Arizona.

These results confirm my earlier advice to you that we were unsuccessful in locating extensions or repetitions of this deposit, and that the Larsen property in itself appears to be too small to warrant further interest by the Company.

In a recent conversation on the phone with Jesse Johnson, head of the Raw Materials Branch of the Atomic Energy Commission, I mentioned to him incidentally the fact that we were investigating the Red Bluff property. I also mentioned that the owner, Mr. Larsen, had expressed his desire to ship to us because of the more favorable freight rates to Bluewater than to other receiving stations. Jesse Johnson indicated that in view of the metallurgical character of this ore, he felt that it should be routed to some acid treatment plant such as the Vitro Company's plant at Salt Lake. Last week Mr. MacPherson, Manager of the Grand Junction office of the Atomic Energy Commission, told me that the Commission was attempting to obtain more favorable freight rates so that Mr. Larsen could ship to that point.


Mr. Frick has recently conducted amenability tests on bulk samples which James L. Kelly and I took from the property at the time of our first visit last April. These tests indicate unsatisfactory recovery (40.8%) by the caustic leach method, and a very good recovery (94.6%) with the acid method.

June 3, 1952

I enclose herewith a copy of my letter to Mr. Larsen, dated today, advising him of the impossibility of our pursuing any further negotiations with regard to this particular prospect.

Also enclosed is a copy of Evelyn Kethley's memorandum report, dated May 19th, covering aerial reconnaissance operations from the 16th to 25th of April in the Red Bluff locality.

Sincerely yours,



J. B. Knobel

JBK:fv

Enc.

cc: Mr. C. E. Weed, w/enc.  
Mr. P. D. I. Honeyman  
Mr. Alex M. McDonald, w/enc.  
Mr. V. D. Perry  
Mr. E. F. Reed, w/enc.  
Mr. R. B. Mulchay, w/enc. ✓  
Mr. J. L. Kelly

# ANACONDA COPPER MINING COMPANY

## New Mexico Operations

Grants, New Mexico  
May 19, 1952

Memorandum To: J. B. Knaebel

Subject: Aerial Reconnaissance Report - April 16 through 25, 1952  
Gila County, Arizona

During the period April 16 through 25th, 45 hours and 35 minutes of aerial scintillometer time was flown in the area adjacent to Globe and the Roosevelt Reservoir in Gila County, Arizona. Reconnaissance flights were made every day that crew and equipment were in the area with flight time being curtailed by weather only in one instance. Although in several instances the area planned for the particular day's work had to be abandoned because of unfavorable flight conditions, it was possible to continue work in another area.

No anomalies which gave positive indication of radioactivity were encountered in any portion of the area flown except over the Red Bluff property. Summarizing the scintillometer performance generally, a large area was often flown with no indicative anomalies of any kind, and the only indications encountered in any part was in almost every instance an increase of from 10 to 30 cps in overall background in an area such as a particular arroyo; a certain portion of an entire slope; or one particular hill or group of hills, where no definite outcropping was ascertainable and overburden was in evidence. In all instances where any increases were noted the area was worked carefully, but no significant increases could be developed within the areas, and the plus 10's and plus 25's which were registered would not repeat consistently nor in the same spots.

Pinal Creek Valley and the area east was covered more completely than some of the other districts, as a different route was flown over the area on each flight to and from Cutter airstrip to the general vicinity of the Roosevelt Reservoir. The only areas of anomalies encountered in this section were along the southwest slope of Squaw Peak from valley level to the top of the rim with the highest increase within the higher-background area being at the southwest tip.

The Salt River Canyon was worked from the point where the river runs into the Roosevelt Reservoir eastward to the point where Cherry Creek enters the Salt River. In this area the only increase was found to be along the southwest exposure of Black Mesa from the river bed up to the 3,400' level.

The Dripping Springs quartzite formation was worked from Salt River north and westward to the Larson location with the area of highest anomaly being in Sections 21, 22 & 27, T 4 N, R 14 E. Work was continued along the Dripping Springs Formation from Larson's location north and westward. The top of the outcropping immediately west of Larson's between Young highway and First Water

Canyon produced some increase in overall background, and some slight increases over the background. The other portion produced no anomalies from the top of the outcropping down to valley level. However, Observer is not in a position to complete the report pertaining to that portion on top of the rim as an additional flight was needed to recheck the area.

Cherry Creek Canyon was worked from the point where the creek runs into Salt River northward to Pueblo Canyon. The conyons branching off in the north portion, being in some instances almost perpendicular, were difficult of access, and cannot be considered as having been thoroughly covered. However, the portions which were accessible produced no indications of any significance. The only anomaly throughout the area being an increase in background at an elevation of from 3,400' to 3,600' in Section 5, T 4 N, R 15 E.

Throughout the entire area the spot where the greatest anomaly was encountered was just north of Inspiration and west of Radium Springs immediately adjacent on the north to Copper City's development.

(Sgd.) Evelyn Kethley  
Evelyn Kethley, Observer



# REPORT ON THE RED BLUFF URANIUM PROSPECT

and

## AERIAL SCINTILLOMETER AND GROUND RECONNAISSANCE OF SURROUNDING AREAS

### Gila County, Arizona

#### Introduction

In February, 1952 the Red Bluff Uranium Prospect was visited by R. B. Mulchay and E. F. Reed. High uranium assay results of several samples taken by Mr. Mulchay prompted immediate interest in this prospect and arrangements were made for further examination of this property as well as an aerial scintillometer and ground reconnaissance of the surrounding area. Several days during April were spent on this reconnaissance and examination of the Red Bluff prospect.

Air reconnaissance was conducted by Pilot W. B. House and Observer Evelyn Kethley. G. A. Barber conducted the ground reconnaissance and assisted in mapping and sampling the Red Bluff property. Mr. E. F. Reed of Inspiration Consolidated Copper Company assisted materially in making arrangements for the examination.

#### Location - Ownership

The Red Bluff property is located about 5 miles northeast of Roosevelt Reservoir in the SE $\frac{1}{4}$  of Section 31, T 5 N, R 14 E, Gila County, Arizona. The workings are a few hundred feet east of the Globe-Young highway, 31 miles north of its junction with U. S. Highway 60-70 between Globe and Miami.

The Red Bluff group of five possessory claims is owned by Mr. and Mrs. Carl Larson, who live near the property. Their mailing address is Young Route, Globe, Arizona.

#### Geology - Mineralization

Uranium mineralization at this prospect occurs in the Dripping Springs quartzite, a member of the Pre-Cambrian Apache group of sedimentary rocks. In this area the quartzite, which outcrops prominently in steep bluffs and cliffs, strikes northwest and dips flatly ( $5^{\circ}$ - $10^{\circ}$ ) northeast. The Mescal limestone, youngest member of the Apache group and directly overlying the Dripping Springs quartzite, outcrops along the slopes east of the property. The Barnes conglomerate, Pioneer shale and Scanlon conglomerate, units of the Apache group underlying the quartzite, are not exposed in the immediate vicinity.

The sedimentary series is cut by a 120-ft. diabase dike which strikes  $N35^{\circ}E$  and dips  $N75^{\circ}W$ . It was probably intruded along a fault structure which displaced the beds about 230 feet vertically, down-drop on the east side. A narrow canyon has been eroded along this dike.

The uranium mineralization is controlled by steep, parallel, northwest fractures in the Dripping Springs quartzite and is apparently favorable to certain beds with a result that the best ore is found along the fractures in a vertical range of the favorable layers. These fractures are not strong and will probably prove to be discontinuous both horizontally and vertically.

Detailed stratigraphy of the Dripping Springs quartzite, as reported in Geological Survey Circular 137, entitled "Uraniferous Quartzite, Red Bluff Prospect, Gila County, Arizona", defines two favorable layers in the quartzite about 25 feet apart. The top of the upper layer is marked by a 1-foot black quartzite bed and the top of the lower layer by a 4-inch black bed. Both of these favorable layers are about 20 feet thick.

Mineralization consists of iron oxides and sulfides along the fractures and tight cracks and bedding planes in the quartzite in the immediate proximity of the fractures. Most of the uranium probably occurs as finely disseminated pitchblende. The quartzite near the fractures is generally darker colored and there are patchy dark spots throughout. Occasionally a thin coating of yellow uranium minerals is found along cracks, but the amount of these yellow minerals is not enough to account for the total  $U_3O_8$  present.

Most of the development work has been done on the west side of the dike along steep, northwest fractures cutting the lower favorable horizon. Mr. Larson has opened up the main fracture by a 3-foot cut 65 feet long and 25 feet deep at the face. From this cut he has mined and stockpiled approximately 75 tons of ore. A 100-pound grab sample of this stockpile assayed 0.364%  $U_3O_8$ .

In the bottom of the cut the quartzite near the fracture has become low grade, the decrease in value apparently due to unfavorable beds. A 3-foot sample across the beds 2 feet north of the fracture at the east end of the cut assayed 0.054%  $U_3O_8$ . This sample was taken below the favorable horizon. A 6-foot horizontal sample across two weak fractures and in the favorable layer about 10 feet north of the main fracture assayed 0.023%  $U_3O_8$ .

A smaller cut has been excavated along another steep northwest fracture 140 feet south of the main cut. Here the scintillometer indicated strong radioactivity along the fracture decreasing rapidly a few inches from it. A 4-foot sample across the beds one foot north of and parallel to the fracture assayed 0.163%  $U_3O_8$ . The 4-inch black quartzite bed which marks the top of the lower favorable horizon occurs near the top of this cut which is in the same bedding horizon as the main cut.

A bulldozer has removed the overburden north of the main cut and exposed other northwest fractures which are quite strongly radioactive. A 2.5-foot horizontal sample across the strongest of these assayed 0.101%  $U_3O_8$ .

The favorable beds between the fractures are radioactive throughout but not nearly so much so as along the fractures. Four samples in the favorable layer away from the fractures assayed 0.023 to 0.03%  $U_3O_8$ . A 100-pound grab sample of material from the south side of the main cut, but not from the strongly mineralized zone along the fracture, assayed 0.054%  $U_3O_8$ .

Fractures exposed in shallow pits southwest of the main cut are not as strongly radioactive as those exposed in the other cuts. Samples taken to check the grade along the fractures and in the quartzite away from the fractures assayed less than 0.1%  $U_3O_8$ . These pits are in beds 25 to 40 feet stratigraphically higher than the main cut, the farthest southwest pits being in the lower part of the upper favorable layer, all that remains of this layer west of the dike. The mineralization may be better in depth where these fractures intersect the lowest favorable layer.

East of the diabase dike a radioactive horizon in the quartzite is exposed near the bottom of the canyon for approximately 350 feet along the east slope. The top of this horizon is marked by a 1-foot black quartzite bed. Radioactivity falls off rapidly above this bed. The lower limit of this zone is indefinite and overburden hinders its exact determination. A check with the scintillometer, however, indicates it to be 15 to 20 feet thick. According to U.S.G.S. stratigraphy this would be the upper favorable layer.

At the north end of this zone numerous steep northwest fractures and joints cut the quartzite and here again radioactivity is strongest along the fractures. Along the zone to the south there are no strong fractures and the overall radioactivity is much weaker.

The only development work on this zone is a short cut along one of the fractures. A 5-foot sample across the bedding one foot from the fracture, and parallel to it, assayed 0.03%  $U_3O_8$ . A grab sample of the muck from this cut assayed 0.127%  $U_3O_8$ . A 5-foot sample across the bedding and between fractures in the radioactive horizon, 55 feet north of the cut, assayed 0.03%  $U_3O_8$ . A sample of the black quartzite bed 160 feet north of the cut assayed 0.065%  $U_3O_8$  and a 4.5-foot thickness of quartzite immediately above the black marker bed assayed 0.01%  $U_3O_8$ .

#### Aerial Scintillometer and Ground Reconnaissance

In view of the fact that the Dripping Springs quartzite is exposed in prominent outcrops along the hills east of Roosevelt Reservoir in the vicinity of the Red Bluff property, an aerial scintillometer reconnaissance was conducted in an effort to find other radioactive areas. Forty-five hours and thirty-five minutes of air scintillometer time were flown in the area north of Globe and east of Roosevelt Reservoir including the Dripping Springs quartzite outcrops east of the reservoir and flights over that country along Pinal Creek from Globe north to the Salt River, eastward along the river to Cherry Creek and north along Cherry Creek to Pueblo Canyon.

In this entire air reconnaissance no sharp, clear-cut anomalies were obtained except over the Red Bluff property. Certain areas, however, showed slight increases over background count but no points of significant increase could be found within these areas. Many slight increases of from 10 to 25 cps over background could not be duplicated on repeated check flights.

A ground reconnaissance was made of several areas which gave these anomalies, with the result that nothing was found which warrants further consideration. Ten samples were taken to check weak radioactivity in five of these areas. None of these assayed more than a trace (radiometric).

The highest anomalies obtained from the air (excluding the Red Bluff property) occurred over a small area northeast of the Copper Cities copper property about 4 miles north of Miami. When checked by ground scintillometer reconnaissance it became apparent that an exposure of quartz monzonite in this area is slightly radioactive, possibly due to potassium-bearing minerals in this intrusive rock. It may be that other anomalies obtained from the air during this reconnaissance are the result of similar weak radioactivity from igneous rock with high potassium content.

#### Summary and Conclusion

At the Red Bluff prospect uranium mineralization, which for the most part is probably finely disseminated pitchblende, occurs along steep, northwest, parallel fractures in the flat-lying Dripping Springs quartzite. The mineralization appears to be controlled not only by the fractures, but also by two favorable quartzite layers each approximately 20 feet thick and 25 feet vertically apart. The best grade mineralization, and that which can be economically mined and shipped to a treating plant at this time, occurs in close proximity to the fractures. Weaker mineralization in the favorable beds away from the fractures is too low-grade to be economic and "ore-grade" material will have to come from narrow widths along the mineralized fractures in a vertical range of the favorable horizons.

To date approximately 75 tons of ore which will assay about 0.85%  $U_3O_8$  has been mined from a cut along the main fracture west of the dike. Additional ore of about that grade should be found along this fracture, and in the favorable horizon, to the northwest, and other strongly radioactive fractures cutting the favorable horizon on the west side of the dike show promise of yielding ore of comparable grade. Since nearly all of the upper favorable layer west of the dike has been removed by erosion, prospecting possibilities are confined to the lower favorable layer.

East of the dike, further prospecting of the radioactive fractures and favorable layers is justified. There is a good possibility of finding ore along fractures in both the upper and lower favorable horizons.

Continued development and mining at this property should produce additional good grade uranium ore but the tonnage is not expected to be large. The negative results of the aerial and ground reconnaissance of surrounding areas and the promise of only small tonnages of shipping ore at the Red Bluff property discourages the interest of Anaconda Copper Mining Company in this district as a mining or further exploration venture.

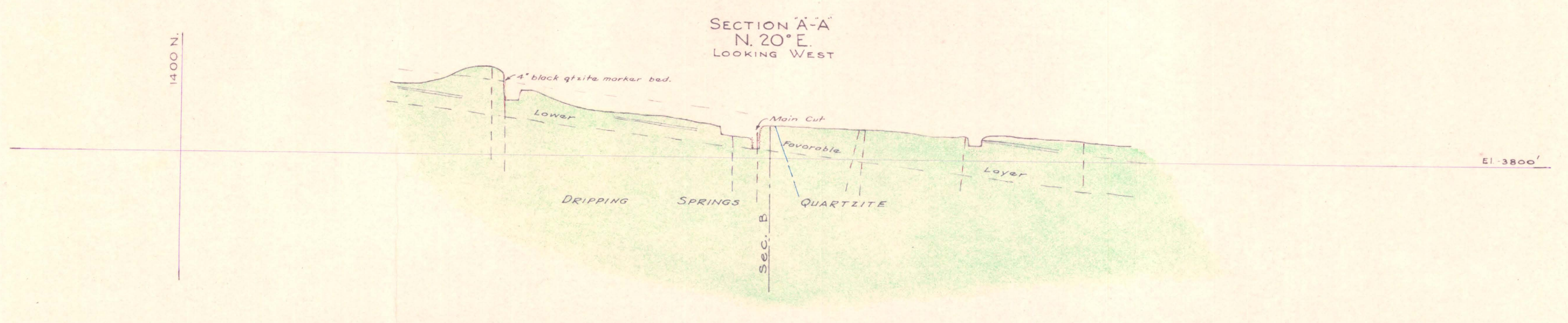
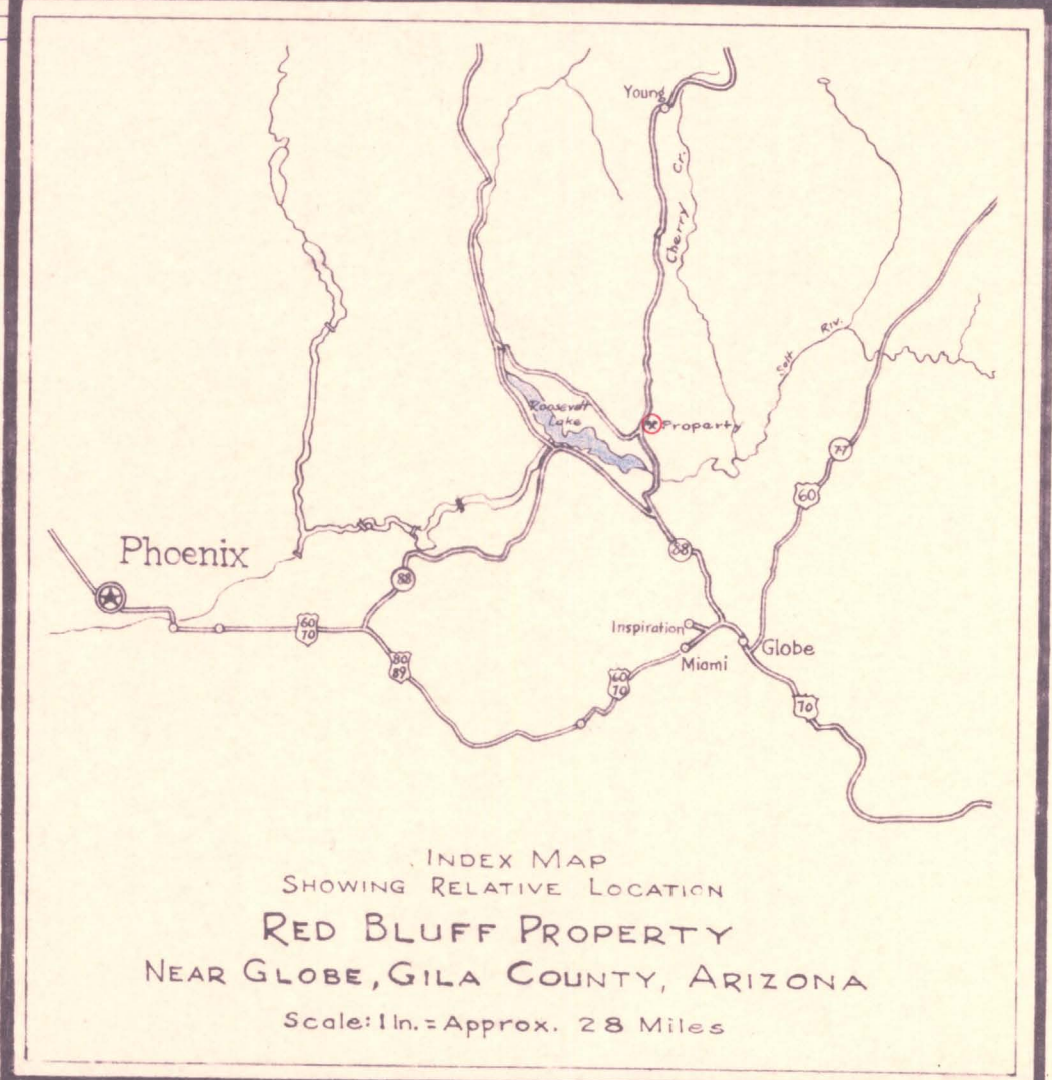
Respectfully submitted,

*James L. Kelly*

James L. Kelly

fv

Grants, New Mexico  
May 27, 1952



**COLOR LEGEND**

- DIABASE DIKE
- MESCAL LIMESTONE
- DRIPPING SPRINGS QUARTZITE

ASSAY - WIDTH - % U<sub>3</sub>O<sub>8</sub> (RADIOMETRIC-WET)

PLAN MAP & SECTIONS  
OF THE  
**RED BLUFF PROPERTY**  
SE 1/4, SEC. 31, T.5N. R.14W.  
NEAR GLOBE,  
GILA COUNTY, ARIZONA  
SCALE: 1 IN. = 50 FT.

To accompany report by James L. Kelly - May-1952