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Samuel I. Bowditch  
4002 East Cooper Street  
Tucson, Arizona 85711

April 1973

Mr. Paul I. Eimon  
Exploration Manager  
1704 West Grant Road  
Tucson, Arizona 85705

Re: San Juan Group  
Lone Star District  
Graham County, Arizona

Dear Sir:

At your request I have traced the chain of title of the San Juan group of claims as shown by the records in the courthouse at Safford, and this is my report. The title now appears to stand in the name of

Guy Anderson et al .	40.00%
Lawrence Maloy et ux	16.00%
Alf B. Claridge et ux	30.00%
Glenn A. Gherkins et ux	6.25%
Essex International	7.75%

subject to the exceptions and reservations noted below.

As you know, the property is made up of

Patented Lode Mining Claims

Hole Brook	)	
Espranza	)	
Bill Nye	)	
Beggerman	)	
Richman	)	U.S. Min. Sur. 3299
Poorman	)	
Inter Mountain	)	
Out Law	)	
Lawyer	)	
Lucky Joe	)	

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Unpatented Lode Mining Claims

<u>Name</u>	<u>Docket</u>	<u>Page</u>	
Blue Bird Nos. 1-17	34	511-527	
Blue Bird Nos. 18-29	34	559-570	
Blue Bird Nos. 30-35	35	82-87	
Blue Bird No. 36	36	151	
Blue Bird No. 37	38	165	
Blue Bird Nos. 38-46	37	457-465	
Blue Bird Nos. 47-48	38	166-167	
Blue Bird Nos. 49-52	37	466-469	
Blue Bird Melody #53- <del>55</del>	39	331-333	55
Blue Bird Melody #100-102, 104	47	339-342	4
Ten Grand Nos. 1-2	37	270-271	2
Rico Nos. 1-2, also known as El Rico Nos. 1-2	36	149-150	2
Moon Nos. 1-4	54	350-353	
Moon Nos. 5-6	55	474-475	
Moon Nos. 7-8	58	226-227	8
Moon No. 9	148	423	
Solo	53	530	/
Liz No. 1	54	348	/
Low Ridge No. 17	58	440	/

Blue Birds No. 22, 24-33 were amended as a result of an accurate survey by Bear Creek, and amended notices, dated 3-3-58, are recorded in Docket 54, pages 354-364.

Blue Bird Melody No. 100 was also amended as a result of Bear Creek's survey, and the name changed to Blue Bird No. 100. Amended notice, dated 11-17-58, was recorded in Docket 59 at page 442.

The following exceptions and reservations are noted:

1. The Moon No. 9 was located by Producers Minerals Corporation, and still belongs to that company. You and the others have no title.

2. There is no record of any deed from John W. Bibb, Jr., the locator of record, covering the Blue Bird Melody Nos. 53-55 and the Blue Bird Melody Nos. 100-102, 104. However, Tuab Mineral Corp., the successor in title to the patented claims and the lower numbered Blue Birds, gave a deed to Bear Creek, dated 9-18-57, and recorded in Docket 50 at page 427, conveying the Blue Birds, Nos. 53-78 (re-recorded in Docket 39 at pages 331-356) and Blue Birds 79-92 (recorded

in Docket 40, at pages 1-14). There is no record that Bear Creek ever reconveyed any of these claims.

3. Bear Creek located the Moon Nos. 1-8, Solo, Liz No. 1, and Low Ridge No. 17 claims, and conveyed them to Tuab Minerals Corp. by quit claim deed dated 3-3-59 and recorded in Docket 61 at page 249. These claims were not subject to the mortgage to Utex, and are not included in the Sheriff's deed to Anderson and Claridge after Utex foreclosed. In Docket 65, page 92-95, is an assignment from Tuab and Bibb, Sr. to Alfred Boss and Thomas Chandler, of a 1/2 interest in the property, including these Bear Creek claims. There is no record that these gentlemen ever did anything about this. There is no record of any deed for the other 1/2 interest in these claims from Tuab, but in Docket 115 at pages 478-481 are two deeds, dated Feb. 6, 1967, one from Ruskin Lines et ux and the other from John Higgins et ux, to Guy Anderson et al, the Claridges and the Maloys. These are quitclaims, and include all the patented claims and all the unpatented claims listed at the beginning of this letter, except the Moon No. 9. John Higgins was the secretary of the Tuab Minerals Corp. shortly before it went broke, and may represent the last surviving stockholder. This would have to be investigated. How Mr. Ruskin Lines fits in I do not know.

I would say that your title to a 1/2 interest in these Bear Creek claims, while perhaps better than anyone else's, is pretty tenuous. You should get legal advice on this. There may be some unrecorded deeds. The other 1/2 interest is apparently in Boss and Chandler.

4. Guy Anderson and Alf Claridge got their title to the Hole Brook group of patented claims, the Blue Birds Nos. 1-52, 100-102, 104, Ten Grand Nos. 1 and 2, the Rico Nos. 1 and 2, and the Melody Nos. 1-36, by Sheriff's deed, as a result of a foreclosure by Utex Exploration Co. and judgment. Utex sold the Sheriff's Certificate to Anderson and Claridge before the Sheriff issued his deed. You should get legal opinion as to the sufficiency of such a title. The deed was issued Apr. 11, 1960, so the statute of limitations should have run out, but I don't know just what that is in Arizona.

Attached to this letter is a short history of the property, as gleaned from the county records, which may make some of what I have written above a bit more clear, and also all the notes I took.

If you have any questions I am at your service.

Yours very truly,

S.I. Bowditch

## SHORT HISTORY OF THE SAN JUAN PROPERTY

The Blue Bird Nos. 1-36 were located from 9-9-55 to 12-1-55 by W.D. Roper, B.A. Gibbs and John Bibb, and the Blue Bird Nos. 37-52 from 3-20-56 to 4-3-56 by B.A. Gibbs and John W. Bibb Jr. The Ricos were located 12-10-55 by Earl Himebaugh, Richard Himebaugh and Mattie Bittick, and the Ten Grands on 3-1-56 by Marie Roper, John Rockhill and Lucille Rockhill.

John W. Bibb and Hyman D. Goldberg, both of Tucson, incorporated the Tuab Minerals Corp. on Oct. 12, 1955, and a Certificate of Incorporation was issued October 15, 1955.

Tuab obtained the Hole Brook group of patented claims from the Valley National Bank as Trustee of an estate, and the above listed unpatented claims by deeds from the locators.

The claims were leased to Bear Creek on July 2, 1957, who kept the property until March of 1959, when they conveyed to Tuab the claims they had located. During this period Tuab apparently was short of funds, for it first mortgaged the property to John W. Bibb, Jr., Bert A. Gibbs, and Hyman Goldberg, and later mortgaged it to Utex for \$41,229.66. Bibb et al agreed to subordinate their mortgage to Utex. Utex eventually foreclosed, took the property over and sold it to Guy Anderson and Claridge. On the same day that the Sheriff issued his Certificate of Sale to Utex, Tuab and Bibb, Jr. assigned a 1/2 interest in the property, including the Bear Creek claims, to Alfred Boss and Thomas Chandler. There is no record of conveyance from these gentlemen, and I suppose the Sheriff's sale wiped out any interest they might have gotten in all except the Bear Creek claims. These are in limbo.

You know the rest, how Anderson and Claridge divided up the property among the present owners (except Essex) and leased it to Phelan Sulphur Company of Texas, who assigned to E.T. Scruggs, who assigned to Chemical Producers Corporation. One O.T. Hill seems also to be mixed up in this, and is supposed to get \$55,000 out. The leased property includes not only what Anderson et al got by Sheriff's deed, but the Bear Creek claims as well, so apparently they felt they had some kind of title.

Blue Bird 56-79 - - - D 59-334  
356

Blue Bird (Melody) 79-92 D 40 - 1-19

Blue Bird (Amended) 22, 24-35 D 54 - 354-364

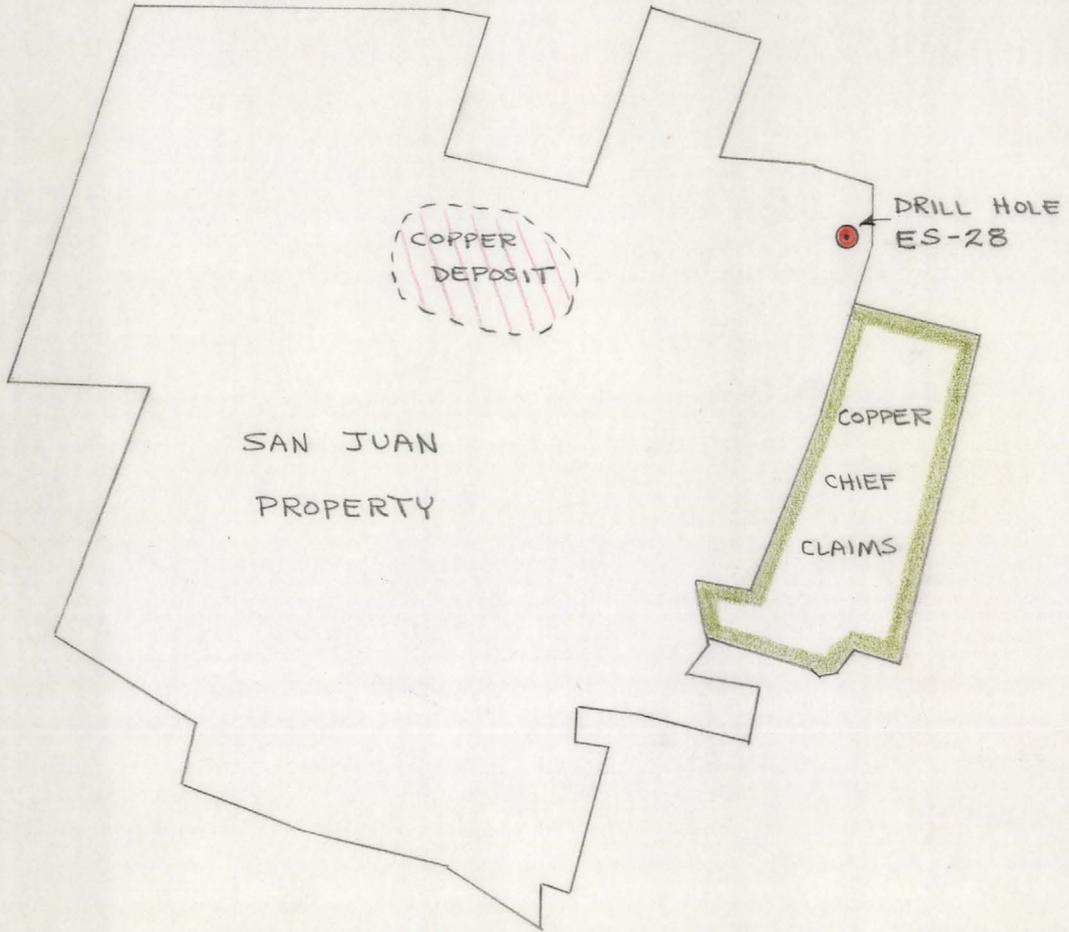
Blue Bird 'S4+S5' 1-17-67 D 114 - 553-554

Claridge, Meloy, Anderson

S4 → joint BB 42 on N + BB 52 on E  
S5 → joint BB 42 on N + moon 8 on west

Sub W D Roger 7-18-57 D 50 - 345

Sub Bear Creek 2-13-58 D 53 - 530



2000 FT.  
SCALE

Aug 8, 1973

BHA

SAFFORD PROJECT

SCHEDULE OF PAYMENTS SUMMARY

SAN JUAN CLAIMS

April 4, 1972

Thru  
Dec. 1972

Claridge (only) Agreement

1% purchased Essex - 1972 \$ 20,000  
2-3/4% @ 30, 60, 90 days - 1972 68,750  
as 22,900, 22,900; 22,950  
Sub Total \$ 88,750

\$88,750

Claridge, Gherkins, Anderson, Malloy Agreements

4% purchased by Essex \$11,000  
(\$4500 - Claridge, Gherkins)  
(\$4500 - Anderson et al)  
(\$2000 - Malloy)

Due 30 days after effective date

Sub Total \$ 11,000

\$11,000

Claridge, Gherkins, Anderson et al, Malloy

Exploration Option due on execution

Due 1 yr. 200  
Due 2 yrs. 300  
Due 3 yrs. 400  
Due 4 yrs. 150,000

\$150,000 each year thereafter

\$ 100

\$ 100

Claridge, Gherkins, Anderson et al, Malloy

Mineral Lease Agreement (Exhibit B to Expl. Option) less Essex 7-3/4% interest

Production royalty 4% gross sales revenue

Advance rental - 1 thru 5 years \$100,000 - 92,250

" " - 6 thru 10 years 150,000 - 138,375

- 11 thru 15 years 200,000 - 184,500

- 16th & ea. yr. after - 250,000 - 230,625

Total 1972

\$99,850

Unless exploration option exercised then \$100,000.

SAN JUAN

Ownership Distribution

April 25, 1973

				<u>Residual Ownership</u>	
<u>Guy Anderson</u>	41-2/3%				
Sell to Essex	1-2/3% *	=			40.00
<u>Alf B. Claridge</u>	41-2/3%				
Sell to Essex	1-2/3% *	=	40.0		
" " "	2-3/4% ⊕	=	37.25		
	1% ⊖	=	36.25		
to Gerkins ∅	6.51%	=	29.74		29.74
<u>Gerkins</u> 6.51%					6.51
<u>Maloy</u>	16-2/3%	=			
Sell to Essex	2/3 *	=	16%		16.0
Essex	7-3/4% *⊕⊖				<u>7.75</u>
					100.00

\* Mining deed to Essex March 24, 1972

⊕ Mining deed to Essex March 17, 1972

⊖ Mining deed to Essex March 16, 1972

∅ No record in file of document deeding interest from Claridge to Gerkins.

APPENDIX II

SELECTED ASSAYS FROM DRILLING AT THE SAN JUAN PROPERTY

Rare Metals Corporation - DDH's

Hole No.	Rare Metals Corp.		Approx. Base of Oxides (feet)	Anaconda - Check Assays					
	Interval (feet)	Tot. Cu%		Interval (feet)	Tot. Cu.%	Ox. Cu.%	Mo. %	Au.	Ag.
RV-1	0-10	No assays	265						
RV-1	10-55	0.21							
RV-1	55-75	0.49		55-75	0.28	0.05	Nil	Nil	0.0
RV-1	75-135	0.29		75-135	0.16	0.09	Nil	Nil	0.0
RV-1	55-135	0.34		55-135	0.19	0.08	Nil	Nil	0.0
RV-1	135-160	0.10							
RV-1	160-175	0.35							
RV-1	175-230	0.13							
RV-1	230-1000	No assays							
RV-2	0-10	No assays	50						
RV-2	10-130	0.12							
RV-2	130-210	0.11							
RV-2	210-290	0.14							
RV-2	10-290	0.12							
RV-2	290-325	0.28		290-325	0.38	0.06	0.002	Nil	0.04
RV-2	325-425	0.19							
RV-2	425-715	No assays							
RV-3		No assays	330						
RV-4	0-10	No assays	635						
RV-4	10-85	0.24							
RV-4	85-225	0.15							
RV-4	225-270	0.31							
RV-4	270-345	0.19							
RV-4	345-920	0.35							
RV-4	920-970	0.51							
RV-4	920-1000	0.42		920-1000	0.31		0.001	Nil	0.01
RV-4	970-1015	0.25							
RV-4	10-1015	0.30							
RV-5	0-40	No assays	360						
RV-5	40-285	0.37							
RV-5	285-390	0.27							
RV-5	390-485	0.26							

## Rare Metals Corporation - DDH's (continued)

Hole No.	Rare Metals Corp.		Approx. Base of Oxides (feet)	Anaconda - Check Assays					
	Interval (feet)	Tot. Cu.%		Interval (feet)	Tot. Cu.%	Ox. Cu.%	Mo. %	Au.	Ag.
RV-5	285-485	0.27							
RV-5	485-725	0.43							
RV-5	500-715	0.46		500-715	0.44		0.001	Nil	0.02
RV-5	725-750	0.25							
RV-5	750-770	0.70							
RV-5	770-850	0.21							
RV-5	850-865	0.92							
RV-5	865-1000	0.23							
RV-5	40-1000	0.34							
RV-5	45-120	0.47							
RV-6	0-30	No assays	455						
RV-6	30-40	0.57							
RV-6	95-245	0.37							
RV-6	245-280	0.22							
RV-6	280-360	0.30							
RV-6	360-400	0.39							
RV-6	400-460	0.22							
RV-6	460-545	0.34							
RV-6	545-825	0.33							
RV-6	825-850	0.11							
RV-6	850-985	0.24							
RV-6	985-1033	0.38							
RV-6	95-1033	0.31							
RV-7	0-340	0.30	420						
RV-7	340-420	0.15							
RV-7	0-420	0.27							
RV-7	420-815	No assays							
RV-8		No assays							
RV-9		No assays							
RV-10		No assays							

SAN JUAN PROPERTY

Rare Metals Corporation - DDH's (continued)

Hole No.	Rare Metals Corp.		Approx. Base of Oxides (feet)	Anaconda - Check Assays					
	Interval (feet)	Tot. Cu.%		Interval (feet)	Tot. Cu.%	Ox. Cu.%	Mo. %	Au.	Ag.
RA-1	0-33	No assays	360						
RA-1	33-63	0.27							
RA-1	63-123	0.44							
RA-1	123-158	0.67							
RA-1	123-168	0.59		123-168	0.46		Nil	0.002	0.01
RA-1	158-168	0.43							
RA-1	188-195	3.20							
RA-1	195-315	0.28							
RA-1	315-370	0.63							
RA-1	370-460	0.39							
RA-1	460-510	0.27							
RA-1	510-530	0.63							
RA-1	530-665	0.09							
RA-1	33-530	0.45							
RA-1	33-665	0.36							
RA-1	665-781	No assays							
RA-2	20-65	0.32	No sulfides						
RA-2	65-115	0.47							
RA-2	115-160	0.56		110-160	0.62		Nil	0.002	0.04
RA-2	20-160	0.45							
RA-2	70-165	0.57		70-165	0.52		Nil	0.001	0.04
RA-2	160-185	0.30							
RA-2	185-445	0.17							
RA-2	445-480	0.38							
RA-2	480-635	0.17							
RA-2	635-670	0.37							
RA-2	670-750	0.25							
RA-2	20-750	0.28							
RA-3	30-70	0.43	335						
RA-3	70-130	0.51							
RA-3	130-170	0.59							
RA-3	30-170	0.51							
RA-3	120-170	0.87		120-170	0.46		Nil	Nil	0.05
RA-3	170-275	0.13							
RA-3	30-275	0.33							
RA-3	275-666	No assays							

SAN JUAN PROPERTY

Rare Metals Corporation - DDH's (continued)

Hole No.	Rare Metals Corp.		Approx. Base of Oxides (feet)	Anaconda - Check Assays					
	Interval (feet)	Tot. Cu.%		Interval (feet)	Tot. Cu.%	Ox. Cu.%	Mo. %	Au.	Ag.
RA-4	30-75	0.27	330						
RA-4	75-110	0.84		75-110	0.72		Nil	Nil	0.0
RA-4	110-125	0.24							
RA-4	125-225	0.44							
RA-4	225-320	0.22							
RA-4	320-450	0.23							
RA-4	345-385	0.29		345-385	0.32		Nil	0.003	0.0
RA-4	365-385	0.30		365-385	0.36		Nil	0.003	0.0
RA-4	30-450	0.30							
RA-4	450-499	No assays							
RA-5	10-190	0.15	No sulfides						
RA-5	190-240	0.45		190-240	0.74		Nil	Nil	0.0
RA-5	175-240	0.37		175-240	0.60		Nil	Nil	0.0
RA-5	240-430	0.10							
RA-5	10-430	0.16							
RA-5	430-521	No assays							

SAN JUAN PROPERTY

Bear Creek Mining Co. - DDH's

Hole No.	Bear Creek Mining Co.		Approx. Base of Oxides (feet)	Anaconda - Check Assays					
	Interval (feet)	Tot. Cu.%		Interval (feet)	Tot. Cu.%	Ox. Cu.%	Mo. %	Au.	Ag.
T-1	No Bear Creek assays available		<115	113.1-112.1	0.21		Nil		
T-1				206.3-215.4	0.04		Nil		
T-1				313.6-323.8	0.05		0.002		
T-1				408.7-418.3	0.04		0.001		
T-1				513.0-522.3	0.07		Nil		
T-1				608.7-618.4	0.07		Nil		
T-1				713.2-722.8	0.05		Nil		
T-1				805.8-815.4	0.09		0.005		
T-1				909.0-916.9	0.08		0.001		
T-1				1014.1-1023.6	0.13		Nil		
T-2			<50	149.4-158.1	0.01		Nil		
T-2				447.9-462.3	0.05		Nil		
T-2				646.6-655.3	0.03		Nil		
T-2				742.3-751.8	0.05		Nil		
T-2				842.1-852.6	0.03		Nil	Nil	Tr.
T-2				852.6-861.1	0.04		Nil	Nil	Tr.
T-2				861.1-873.6	0.03		Nil	Nil	Tr.
T-2				873.6-882.6	0.03		Nil	Nil	Tr.
T-2				882.6-899.3	0.02		Nil	Nil	Tr.
T-2				947.9-957.0	0.04		Nil		
T-2				1042.0-1051.3	0.04		Nil		
T-5			65	106.2-119.8	0.05		nil		
T-5				209.8-217.8	0.09		5 ppm		
T-5				316.0-325.8	0.04		5 ppm		

SAN JUAN PROPERTY

Bear Creek Mining Co. - DDH's

Hole No.	Bear Creek Mgn.Co.		Approx. Base of Oxides (feet)	Anaconda - Check Assays					
	Interval (feet)	Tot. Cu.%		Interval (feet)	Tot. Cu.%	Ox. Cu%	Mo. %	Au.	Ag.
T-6	No Bear Creek Assays Available		455-??	450-590	0.16		<0.001	Nil	Tr.
T-6				972.6-982.1	0.07		Nil	Nil	Tr.
T-6				1077.2-1087.2	0.07		Nil	Nil	Tr.
T-6				1178.5-1193.8	0.06		Nil	Nil	Tr.
T-6				1279.6-1288.6	0.05		Nil	Nil	Tr.
T-6				1375.0-1384.4	0.12		0.001	Nil	Tr

SAN JUAN PROPERTY

Anderson Co. - DDH's

Hole No.	Interval (feet)	Tot. Cu. %	Approx. Base of Oxides (feet)	Anaconda - Check Assays						
				Interval (feet)	Tot. Cu. %	Ox. Cu. %	Mo. %	Au.	Ag.	
#1	No Anderson assays available		<205	198-208	0.16					
#1				310-319	0.19					
#1				319-329	0.20					
#1				329-339	0.23					
#1				585-595	0.02		Nil	Nil	Tr.	
#1				801-809	0.09					
#1				895-904	0.05					
#1				904-913	0.15					
#1				1001-1009	0.07					
#1				1177-1186	0.04		0.002	Nil	Tr.	
#1				1294-1303	0.03		Nil	Nil	Tr.	
#1				1398-1407	0.09					
#2			100	957-966	0.11					
#3			120	59.0-68.5	0.08					
#3				550.5-564.0	0.03					
				<u>Kerr-McGee Oil Industries, Inc. Assays</u>						
#5			900	0-103	Not assayed					
#5				103-220	0.41		0.001	0.005	0.02	
#5				220-390	0.26		Nil	Tr.	0.02	
#5				390-480	0.39			Tr.	0.03	
#5				480-500	0.69			Nil	0.02	
#5				500-550	0.51			0.01	0.07	
#5				550-610	0.43			Nil	Nil	
#5				610-650	0.32			Tr.	0.08	
#5				650-700	0.38			Tr.	0.06	
#5				700-750	0.33			Tr.	0.14	
#5				750-800	0.34		0.003	Tr.	0.14	
#5				800-850	0.34		0.001	Tr.	0.14	
#5				850-920	0.22			Nil	Tr.	
#5				920-960	0.38			Nil	0.14	
#5				960-1014	0.31			Tr.	0.18	
#5				1014-1070	0.35		0.002	Tr.	0.11	

SAN JUAN PROPERTY

Anderson Co. - DDH's (continued)

<u>Hole No.</u>	<u>Interval (feet)</u>	<u>Tot. Cu.%</u>	<u>Approx. Base of Oxides (feet)</u>	<u>Kerr-McGee Oil Industries, Inc. assays</u>					
				<u>Interval (feet)</u>	<u>Tot. Cu.%</u>	<u>Ox. Cu.%</u>	<u>Mo. %</u>	<u>Au.</u>	<u>Ag.</u>
#5				1070-1120	0.14			Nil	0.0
#5				1120-1230	0.21			0.01	0.0
#5				1230-1280	0.32			Nil	0.7
#5				1280-1311	0.19				0.0

SAN JUAN PROPERTY

Scrugg's Rotary Drill Holes

Hole No.	Scrugg's Mng. Co. (50' Averages)		Approx. Base of Oxides (feet)	Anaconda - Check Assays					
	Interval (feet)	Oxide Cu. %		Interval (feet)	Tot. Cu. %	Ox. Cu. %	Mo. %	Au.	Ag.
#1		0.19		0-40	0.22	0.11	0.002		
#2		0.54		0-50	0.53	0.44	<0.001		
#3		0.06		0-50	0.05	0.03	Nil		
#4		0.12		0-50	0.15	0.11	Nil		
#5		0.13		0-50	0.10	0.08	Nil		
#6		0.15							
#7		0.21							
#8		0.17							
#9		0.19							
#10		0.49							
#11		0.49							
#12		Not Drilled		Not Drilled					
#13		0.48							
#14		2.12							
#15		0.25		0-20	0.72	0.68	Nil		
#16		No data		0-50	0.29	0.19	Nil		
#17		Not drilled		Not drilled					
#18		0.75							
#19		0.91							
#20		0.11							
#21		0.19							
#22		0.09							
#23		0.57							
#24		0.80		0-50	0.90	0.87	Nil		
#25		0.41							
#26		0.33							
#27		No data		10-50	0.40				
#28		No data							
#29		0.80		0-40	0.93	0.91	0.001		
#30		No data		1-10					
				40-50	0.58				
#31		Not drilled		Not drilled					
#32		Not drilled		Not drilled					
#33		Not drilled		Not drilled					
#34		Not drilled		Not drilled					
#35		Not drilled		Not drilled					
#36		No data		0-50	0.23				
#37		No data		0-50	0.68				
#38		No data		0-50	0.23				
#39		No data		0-50	0.26				
#40		0.76		0-50	0.82	0.73	0.002		
#41		No data		0-50	0.32				
#42		No data		0-50	0.24				
#43		Not drilled							
#44		No data		0-50	0.36				
#45		No data		0-50	0.26				

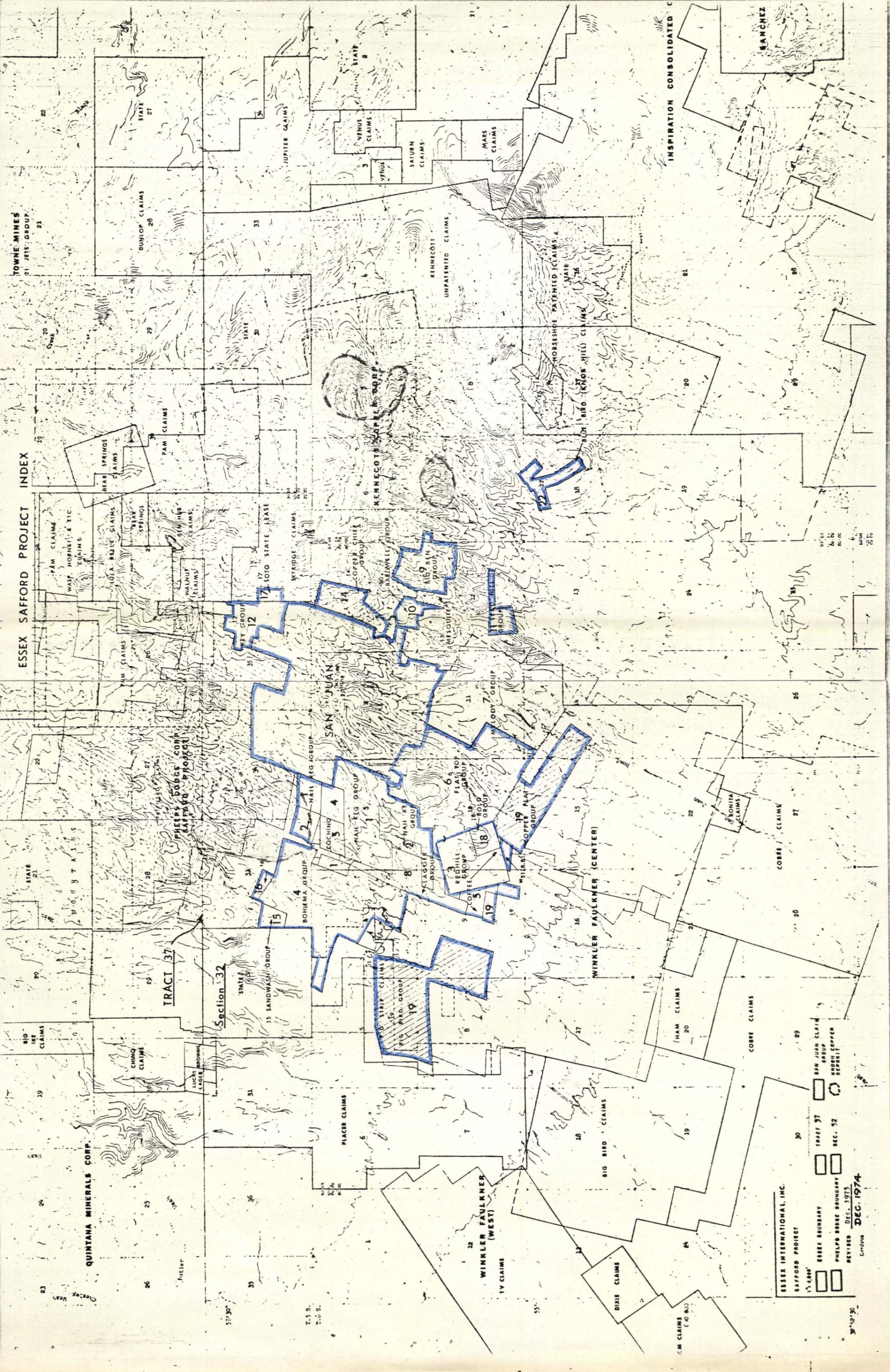
SAN JUAN PROPERTY

Scrugg's Rotary Drill Holes

Hole No.	Scrugg's Mining Co. (50' Averages)		Approx. Base of Oxides (feet)	Anaconda - Check Assays					
	Interval (feet)	Oxide Cu.%		Interval (feet)	Tot. Cu.%	Ox. Cu.%	Mo. %	Au.	Ag.
#46	No data			0-50	0.21				
#47	No data			0-50	0.31				
#48		1.27							

<u>Scrugg's 30' Average</u>	
1A	0.92
2A	1.63
3A	1.00
4A	0.88
5A	0.63
6A	0.46
7A	1.28
8A	5.77
9A	0.48

ESSEX SAFFORD PROJECT INDEX



QUINTANA MINERALS CORP.

TRACT 37

Section 32

WINKLER FAULKNER (WEST)

WINKLER FAULKNER (CENTER)

ESSEX INTERNATIONAL, INC.

SAFFORD PROJECT

1" = 400'

ESSEX BOUNDARY

TRACT 37

PHelps DODGE BOUNDARY

SEC. 32

REVISED DEC. 1973

DEC. 1974

CR/200

31° 19' 30"

105° 19' 30"

T.S.S. T.O.S.

57° 30'

55'

30

29

28

27

26

25

24

23

22

21

20

19

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12

11

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STATE 21

STATE 20

STATE 19

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STATE 14

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STATE 3

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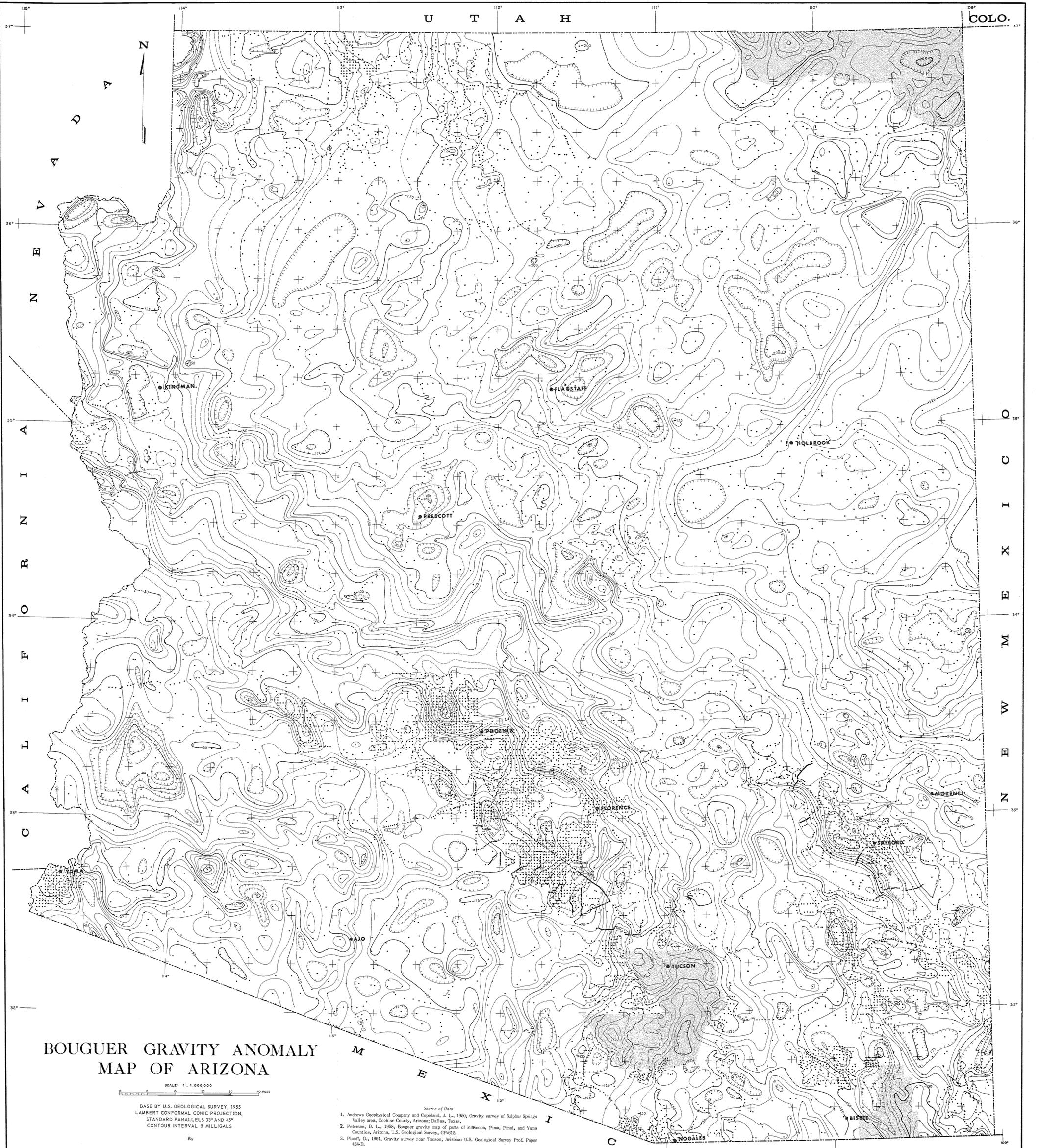
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# BOUGUER GRAVITY ANOMALY MAP OF ARIZONA

SCALE: 1 : 1,000,000  
 0 10 20 30 40 50 MILES

BASE BY U.S. GEOLOGICAL SURVEY, 1955  
 LAMBERT CONFORMAL CONIC PROJECTION,  
 STANDARD PARALLELS 29° AND 49°  
 CONTOUR INTERVAL 5 MILLIGALS

By  
 ROBERT E. WEST and JOHN S. SUMNER  
 1973

Revision of "Regional Bouguer Gravity Anomaly Map of Arizona," 1972

Gravity data were obtained from surveys by the Laboratory of Geophysics of The University of Arizona, U.S. Defense Mapping Agency, U.S. Geological Survey, Exxon Corporation, and mining companies and contractors. The index map gives the primary sources of data for particular areas. A density of 2.67 gm/cm<sup>3</sup> was used for the Bouguer corrections. Terrain corrections are not included except where they were calculated by the original source of the data; these areas are indicated on the index map. The station interval ranges from approximately one to five miles; a stippled pattern indicates where the station interval is less than one mile. Elsewhere the contours are dashed. In the Grand Canyon area and the Santa Catalina and Pinaleno Mountains, Bouguer anomaly values with large terrain effects were not used in contouring.

University of Arizona personnel who participated in regional gravity surveys to obtain data for this map include, in addition to the authors, Jerry Golden, William Johnson, Stephen Hench, Clifford Dewey, Robert Staley, Brian Hogan, Gene Beetz, Jonathan Earl, Carlos Aiken, James Schmidt, and Gary Young. Other University of Arizona gravity data used in this map are from M.S. and Ph.D. theses and dissertations, as noted on the index map.

U.S. Geological Survey data used in this map are from the surveys also noted on the index map. U.S. Defense Mapping Agency gravity survey field crews were directed by R. Iverson, P. B. Beruff, and C. H. Marcum.

Financial assistance for production of this map was provided by the National Science Foundation, AMAX Exploration Company, Exxon Corporation, The University of Arizona, the Arizona Water Resources Research Center, the U.S. Defense Mapping Agency, the State of Arizona Oil and Gas Conservation Commission, and the Four Corners Regional Commission.

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