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SAN LUIS PROSPECT
Pima County, Arizona

The San Luis Prospect is located about 70 miles SSW of Tucson along the west side of the San Luis Mountains.

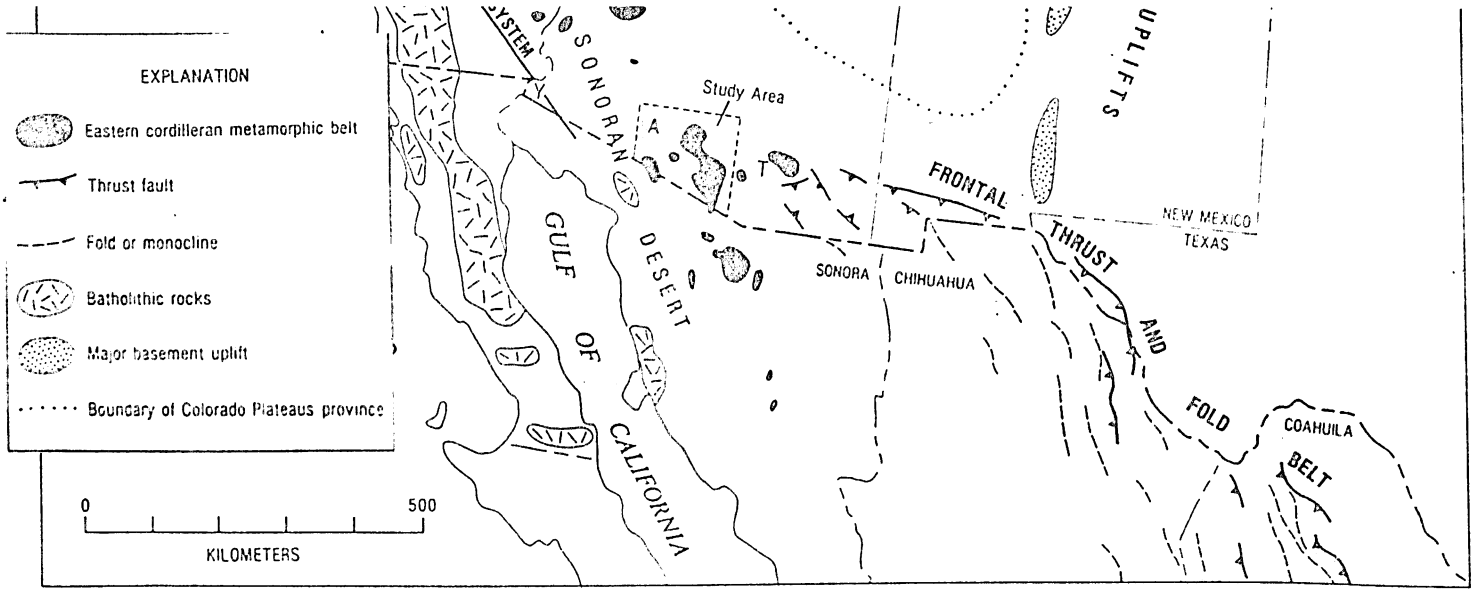
Mining activity in the area dates back to the Spanish period. The San Luis Mine operated intermittently from the 1880's until 1914. Since then there have been sporadic development and exploration programs, especially during the 1930's and 1950's.

The adjacent placer workings have had a similar history. The Oceanic District is credited with producing several thousand ounces of gold averaging 1/2 oz./ton with some silver credits.

Gold mineralization at the San Luis mine occurs in east-west striking quartz veins that dip 20-30^{0} to the north. Workings extend to the 600 level (approx. 320') with stopes developed above the water table. Numerous prospect pits, shafts and adits sprinkle the area, and within the granite they are typically located in badly broken rock that is locally sericitized with abundant quartz veining. Geologic mapping, and soil and rock chip geochemical surveys have been conducted over parts of the area that is prospective. Many interesting areas remain untested.

During June and July of 1989 twenty (2-1/2" dia.) rotary holes were drilled using an air track. The holes ranged between 60' and 132' with one hole reaching a depth of 156'. Depth was determined by water or moisture in the hole which prevented drilling cuttings from being blown out of the hole. The location of the drill holes is shown on the generalized geologic map.

SAN LUIS PROSPECT



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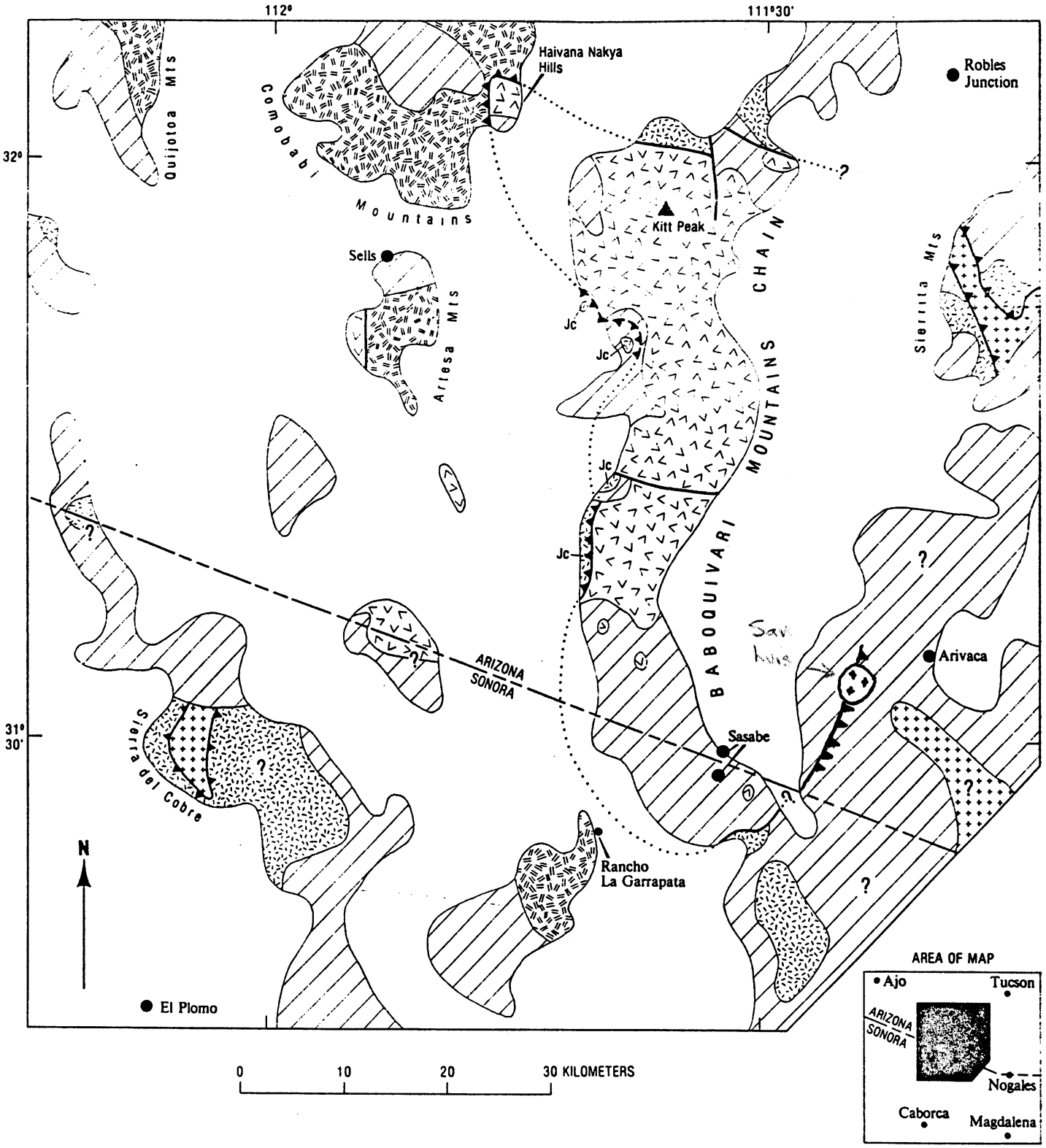

EXPLANATION

- Post-Jurassic intrusive and supracrustal rocks (includes small areas of Precambrian granite in Sierrita Mountains)
- Jurassic plutonic and (or) supracrustal rocks similar to those of the Comobabi and Artesa Mountains
- Jurassic plutonic and supracrustal rocks present
- Jc — Jurassic plutonic or supracrustal rocks, but not both, present
- Jurassic supracrustal and (or) plutonic rocks similar to those of the Baboquivari Mountains
- Jurassic or Jurassic (?) supracrustal rocks of uncertain affinities (includes small areas of Precambrian, Paleozoic, and Lower Cretaceous sedimentary or metasedimentary rocks in western Sierrita Mountains)
- Baboquivari thrust fault; dashed where inferred adjacent to ranges; dotted where concealed beneath valley-fill gravel
- Other thrust fault
- Detachment and (or) high-angle fault

The results were as follows:

SL-RDH-1

footage	ppm Au
0-12	.04
12-24	.12
24-36	.04
36-48	<.02
48-60	.51
60-72	<.02
72-84	<.02
84-96	<.02
96-108	.22
108-120	.06

SL-RDH-2

footage	ppm Au
0-12	<.02
12-24	<.02
24-36	<.02
36-48	<.02
48-60	<.02
60-72	<.02

SL-RDH-3

footage	ppm Au
0-12	<.02
12-24	<.02
24-36	<.02
36-48	<.02
48-60	.05
60-72	.03
72-84	.14

SL-RDH-4

footage	ppm Au
0-12	.06
12-24	<.02
24-36	.04
36-48	<.02
48-60	<.02
60-72	<.02
72-84	<.02
84-96	<.02

SL-RDH-5

footage	ppm Au
0-12	.07
12-24	<.02
24-36	<.02
36-48	<.02
48-60	<.02

SL-RDH-6

footage	ppm Au
0-12	<.02
12-24	<.02
24-36	<.02
36-48	<.02
48-60	<.02
60-72	<.02
72-84	<.02
84-96	<.02

SL-RDH-7

footage	ppm Au
0-12	<.02
12-24	<.02
24-36	<.02
36-48	<.02
48-60	<.02
60-72	<.02

SL-RDH-8

footage	ppm Au
0-12	<.02
12-24	<.02
24-36	<.02
36-48	<.02
48-60	.13
60-72	.04

SL-RDH-9

footage	ppm Au
0-12	<.02
12-24	<.02
24-36	<.02
36-48	.04
48-60	<.02
60-72	.04
72-84	<.02
84-96	<.02
96-108	<.02

SL-RDH-10

footage	ppm Au
0-12	<.02
12-24	<.02
24-36	<.02
36-48	.08
48-60	<.02
60-72	<.02
72-84	<.02
84-96	<.02
96-108	.13
108-120	<.02
120-132	<.02

SL-RDH-11

footage	ppm Au
0-12	<.02
12-24	<.02
24-36	<.02
36-48	<.02
48-60	<.02
60-72	<.02
72-84	<.02
84-96	<.02
96-108	<.01
108-120	<.02
120-132	.03

SL-RDH-12

footage	ppm Au
0-12	.11
12-24	<.02
24-36	<.02
36-48	<.02
48-60	<.02
60-72	<.02
72-84	<.02
84-96	.10
96-108	<.02

SL-RDH-13

footage	ppm Au
0-12	<.02
12-24	<.02
24-36	<.02
36-48	<.02
48-60	<.02
60-72	<.02
72-84	<.02
84-96	<.02

SL-RDH-14

footage	ppm Au
0-12	<.02
12-24	<.02
24-36	<.02
36-48	<.02
48-60	<.02
60-72	<.02
72-84	<.02
84-96	<.02
96-108	<.02
108-120	<.02

SL-RDH-15

footage	ppm Au
0-12	.05
12-24	.04
24-36	.04
36-48	<.02
48-60	<.02
60-72	<.02
72-84	<.02
84-96	<.02
96-108	<.02
108-120	<.02

SL-RDH-16

footage	ppm Au
0-12	.21
12-24	.02
24-36	.04
36-48	.05
48-60	<.02
60-72	.02
72-84	.09
84-96	.07

SL-RDH-17

footage	ppm Au
0-12	<.02
12-24	<.02
24-36	<.02
36-48	.18
48-60	<.02
60-72	<.02
72-84	<.02
84-96	<.02

SL-RDH-18

footage	ppm Au
0-12	<.02
12-24	<.02
24-36	<.02
36-48	<.02
48-60	<.02
60-72	<.02
72-84	.07
84-96	<.02
96-108	<.02
108-120	<.02
120-132	<.02
132-144	<.02
144-156	<.02

SL-RDH-19

footage	ppm Au
0-12	<.02
12-24	<.02
24-36	<.02
36-48	<.02
48-60	<.02
60-72	<.02
72-84	1.70 fire assay .075 oz/ton
84-96	<.02
96-108	<.02
108-120	<.02

SL-RDH-20

footage	ppm Au
0-12	.04
12-24	.02
24-36	<.02
36-48	<.02
48-60	<.02
60-72	<.02
72-84	<.02

All rock, soil, and drill chip samples were analyzed by Skyline Laboratories in Tucson using AA spectroscopy, except that a 2 assay ton fire assay was run on the drill cuttings of RDH-19-72'-84'.

Reno 8-21-89

NO Cover letter

8-24-89

Pima Co., Az

SAN LUIS PROPERTY

M. gustin T/w Bill Reed.

Property not interesting.

(R)

Recent gravel
TK porphyry
TK granite
TK volcanics
drill hole
1" = 500'

• Soil Sample location

Float & outcrop Sample location

Values in ppm

1" = 500'

Detailled Rock Chip Samples
values in ppm Au
values <.02 not plotted
1" = 500'

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SAN LUIS PROSPECT
Pima County, Arizona

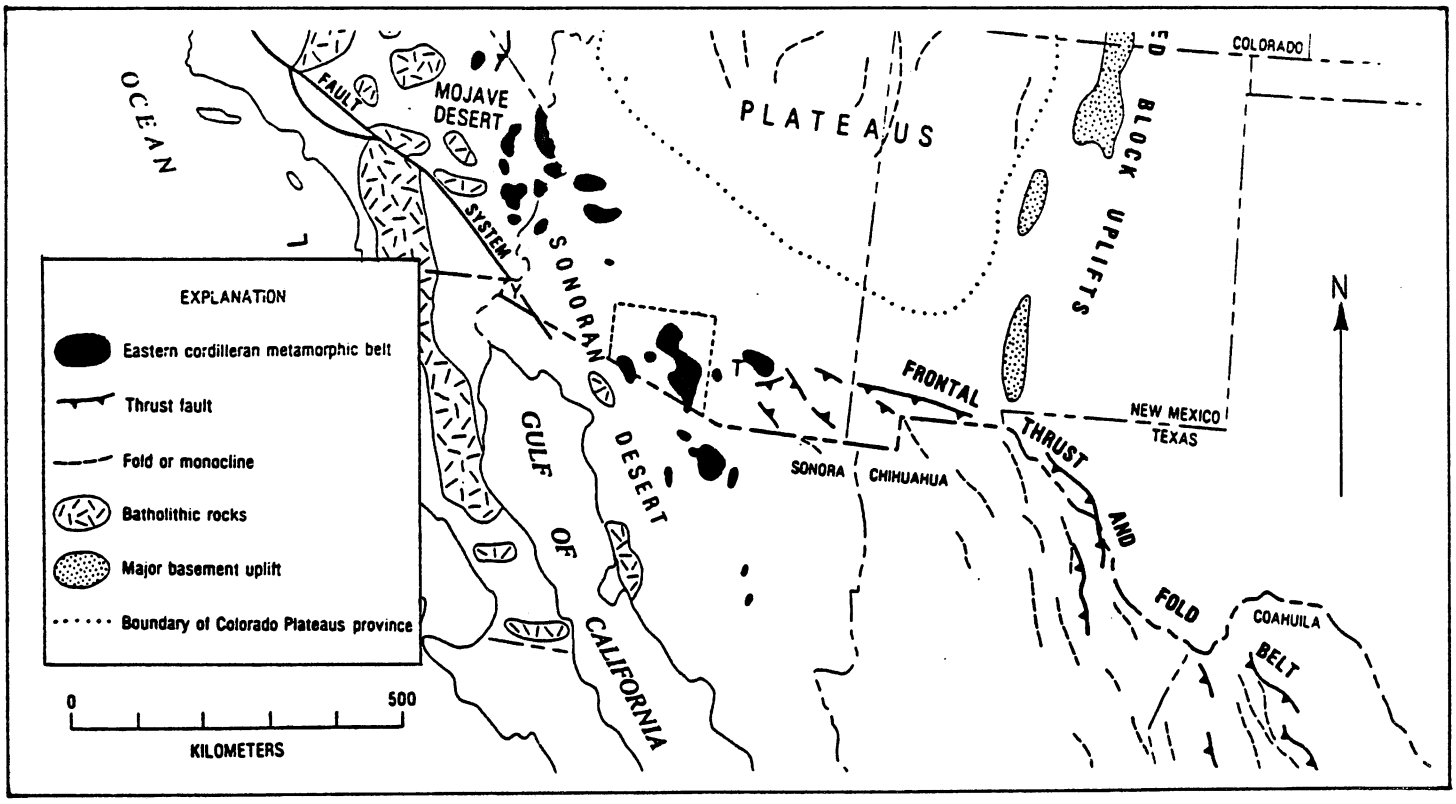

fig. 1

Summary and Conclusions

The San Luis Prospect is located 60 miles SSW of Tucson on the northern margin of the Senora gold provence. The property is situated on the west side of the San Luis Mountains about four miles west of the historic mining town of Arivaca. A window exposes gold mineralization developed along and above a regional thrust fault on the west side of the Altar Valley. The San Luis area has been studied, sampled and drilled over the past 18 months in order to evaluate the potential for discovery of minable gold ore reserves. These studies have demonstrated:

- Widespread gold anomalies in soil and rock samples.
- A drill hole intercept running .075 oz./ton gold over 12' and numerous other anomalous intervals in shallow, small diameter reconnaissance drill holes
- Significant historical production from high grade fissure veins.
- Recognition of a low angle shattered contact zone between granitic rocks and overlying andesite which is in excess of 20' thick and averages 1/2 oz./ton gold
- Potential for discovery of bulk tonnage gold ore reserves of significant grade over a wide area.

History

Much of the early history is based upon unconfirmed reports and rumor. Legend has it that the San Luis Mine was originally discovered and operated by Jesuits, as were many gold and silver mines in the area. Between 1886 and 1900 the area was located by various prospectors. In 1901 the claims were acquired and consolidated by the Oceanic Mining Co., who successfully operated the mine and a 20 ton per day mill until 1914 when the owner died. During this period, it is estimated that the mine produced approximately 2,000 oz. of gold with the ore averaging more than 1/2 ounce per ton gold and carrying a similar amount of silver. In 1920 fourteen claims were patented.

During 1930 and 31 some underground development and exploration was carried out by the Oceanic Mining Company. The results are summarized in several historic engineering reports.

Little is known about the history of placer mining in the area except that it also dates back to the Spanish period. There is widespread evidence of ground sluicing and placer mining along the pediment on the north side of San Luis Wash for a distance of about one mile adjacent to the San Luis Mine. The quantity of gold produced from the placer deposits is unknown, but probably totals less than the 2,000 oz. produced from the lode deposits.

Geology

Published geologic mapping in the San Luis Mountains is based on photogeologic interpretation. Limited field checking suggests that Mesozoic shales (Mzsh) and

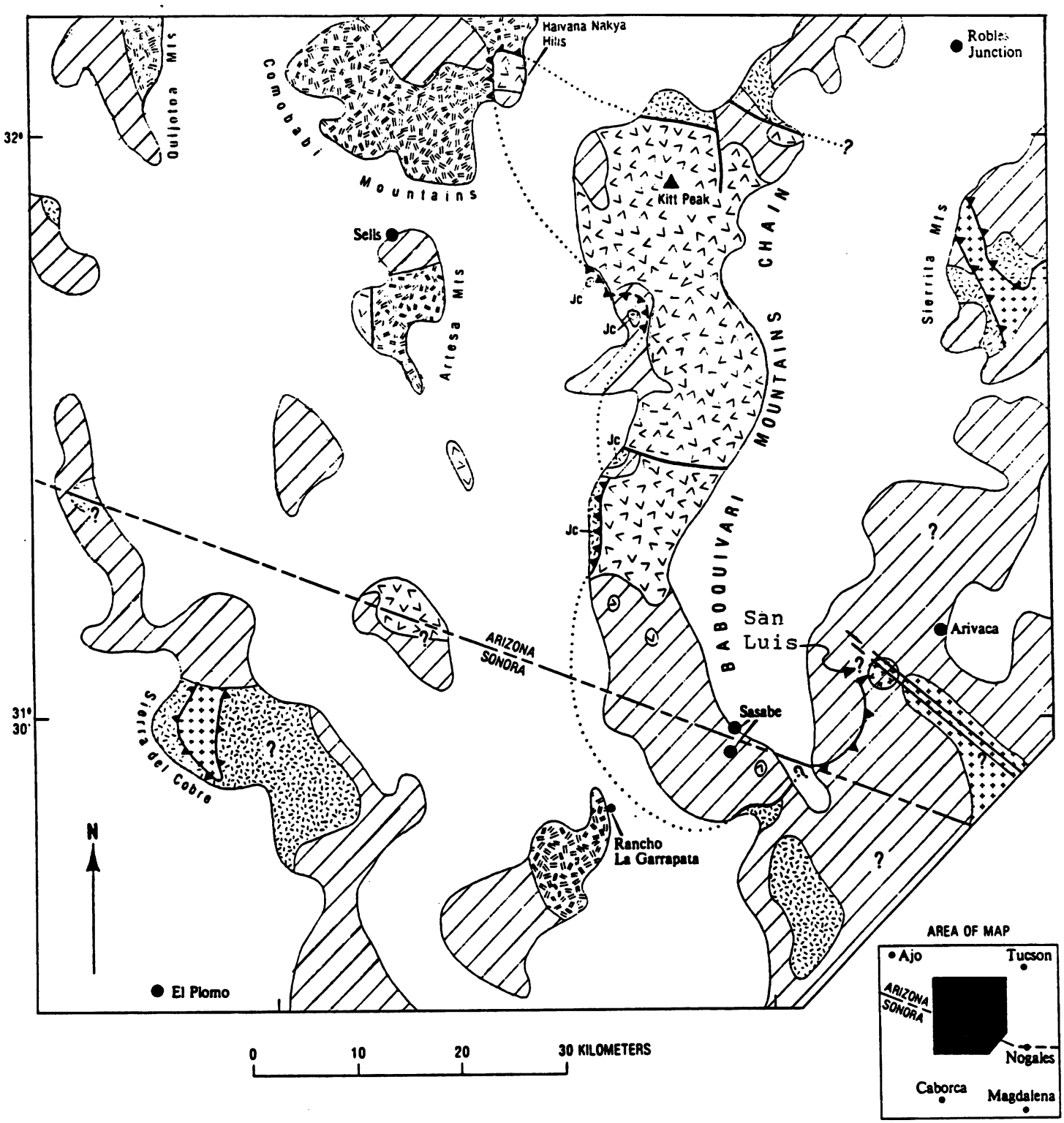

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fig. 2

conglomerates (Mzc) overlain by Mesozoic andesite (Mza) have been intruded by late Cretaceous–early Tertiary granitic plutonic (Tkgm and Tkqd) rocks of the Cobre Ridge intrusive complex (figs. 3 and 5). Latest Cretaceous-early Tertiary trusting and folding, as well as uncertain field relationships make the age sequence between the shale, conglomerate, and the andesite uncertain. A swarm of latest Cretaceous-early Tertiary intermediate to felsic dikes (Tkd) emplaced along a zone of regional NW trending faults intrude older rocks for a distance of at least forty miles to the southeast. Quartz veining with accompanying precious metal-sulfide mineralization is focused along the northern contact between the San Luis Stock (TKgm) and older rocks along a zone cut by NE trending step faults which are down dropped to the northwest. Eluvial placer gold deposits have accumulated on the pediment developed within the window exposing the San Luis Stock.

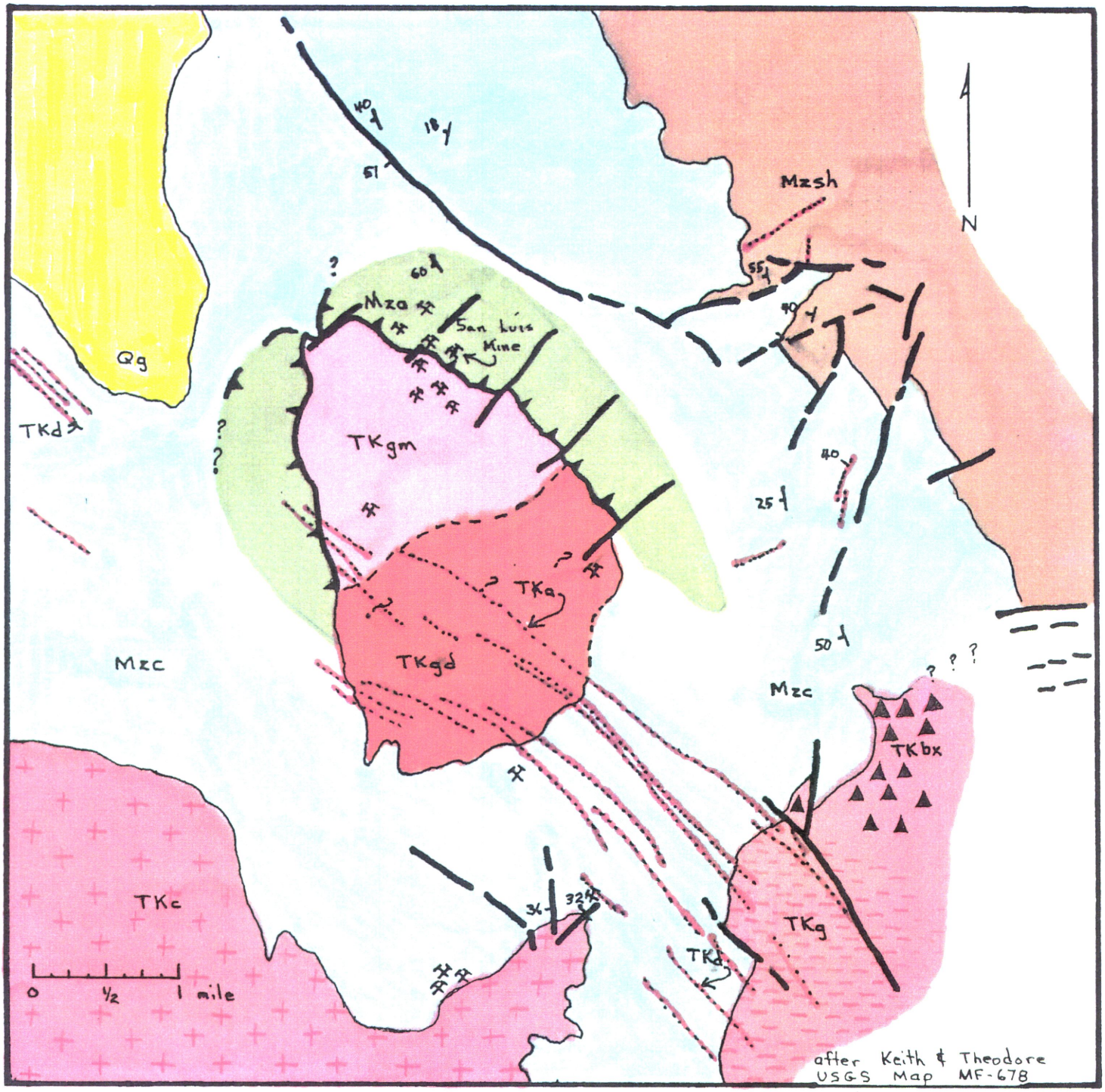
The underlying rock unit in the area is a thick Mesozoic conglomerate (Mzc) composed of subrounded andesitic pebble to cobble size fragments set in a matrix of poorly sorted volcaniclastic detritus. The conglomerate is well cemented, and where subjected to shearing, break smoothly across clasts and matrix alike.

Overlying the conglomerate is a Mesozoic andesite which contains intercalated volcaniclastics and/or tuffaceous units, and in lower parts of the mine is a diorite. Regional structural features, as well as field relationships suggest that the Mesozoic andesitic unit is older than the conglomerate, and has been trust over it. In the vicinity of the mine, the andesite has been badly broken, thermally metamorphosed, and contains large nodules of epidote. Keith and Theodore recognize a similar andesitic unit that is older than the conglomerate to the east, and a possible source of volcaniclastic conglomeratic detritus.

The above units have been intruded by the Cretaceous-Tertiary San Luis Stock (TKgm) which is a medium grained equigranular quartz monzonite. The stock is situated at the northwest end of Cobre Ridge intrusive complex, which extends at least 40 miles to the SE, and has been cut by numerous intermediate to felsic dikes. The dikes have been emplace along a high angle NW trending fault zone, and are closely associated with Au - Ag mineralization at Oro Blanco, Ruby, and numerous other mining camps..

The other major structural feature is a regional thrust and fold belt which extends from Coahuila and Northern Chihuahua, northwestward through southern most New Mexico, and into SE Arizona and NE Senora (figs. 1 and 2). This regional episode of compression, crustal thickening, metamorphism and high heat flow is synchronous with granitic plutonism in latest Cretaceous and early Tertiary. Consequently, the roof of latest Cretaceous-early Tertiary granitic plutons correspond closely with the thrust zone (See fig. 4). The latest stage plutonic differentiates and accompanying hydrothemal fluids have invaded these weaked zones at numerous localities including San Luis.

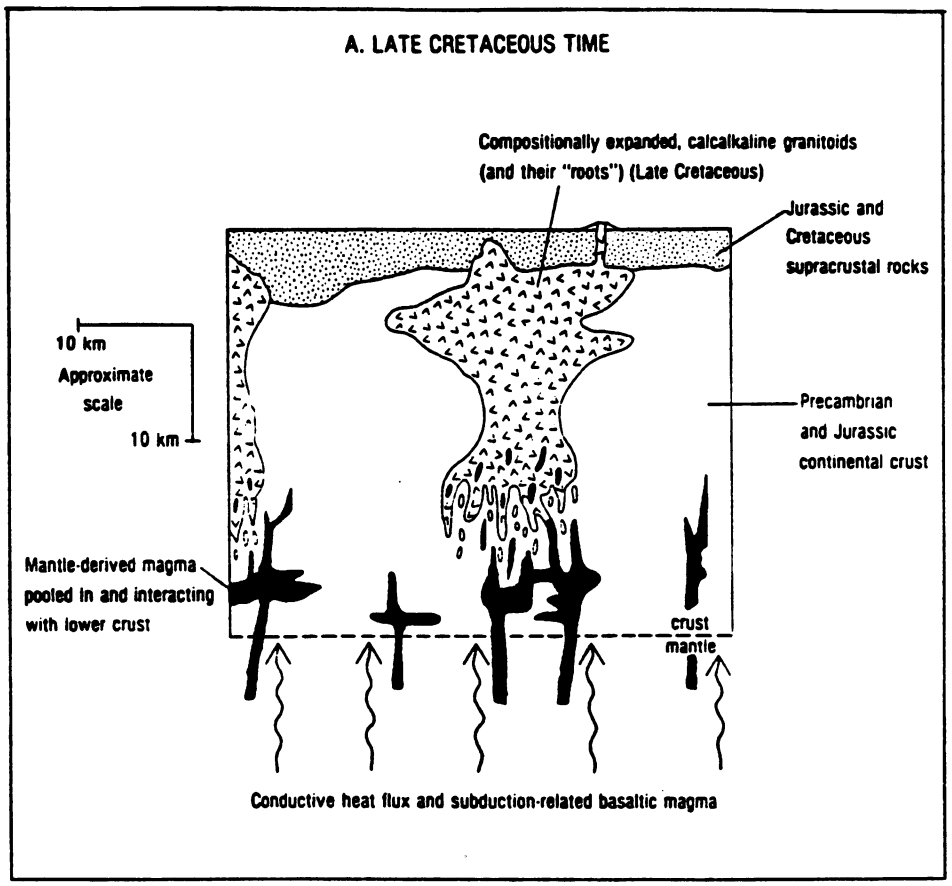
A series of NE trending high angle step faults, which are down dropped to the NW, intersect the quartz monzonite-andesite contact in the mineralized area. This zone continues to NE crossing Arivaca Creek and Las Guijas Wash. The intersection of this zone with these drainages is the source for placer gold deposits which were worked by the Spaniards.



GEOLOGY OF THE SAN LUIS WASH PIMA COUNTY, ARIZONA

Qg	Gravel	
TKd	Dike rocks of Cobre Ridge	
TKa	Alaskite	
TKbx	Intrusive breccia of Cobre Ridge	
TKc	Granitic rocks of Canoa Ranch * undivided	
TKqm	Quartz monzonite of San Luis Wash	
TKqd	Quartz diorite of San Luis Wash	
TKg	Granitic rocks of Cobre Ridge * undivided	
Mzc	Conglomerate	
Mzsh	Shale	Fault
Mza	Andesite	? Thrust fault

fig. 3


A. LATE CRETACEOUS TIME
Compositionally expanded, calcalkaline granitoids (and their "roots") (Late Cretaceous)
Jurassic and Cretaceous supracrustal rocks
10 km
Approximate scale
10 km
Precambrian and Jurassic continental crust
Mantle-derived magma pooled in and interacting with lower crust
crust
mantle
Conductive heat flux and subduction-related basaltic magma

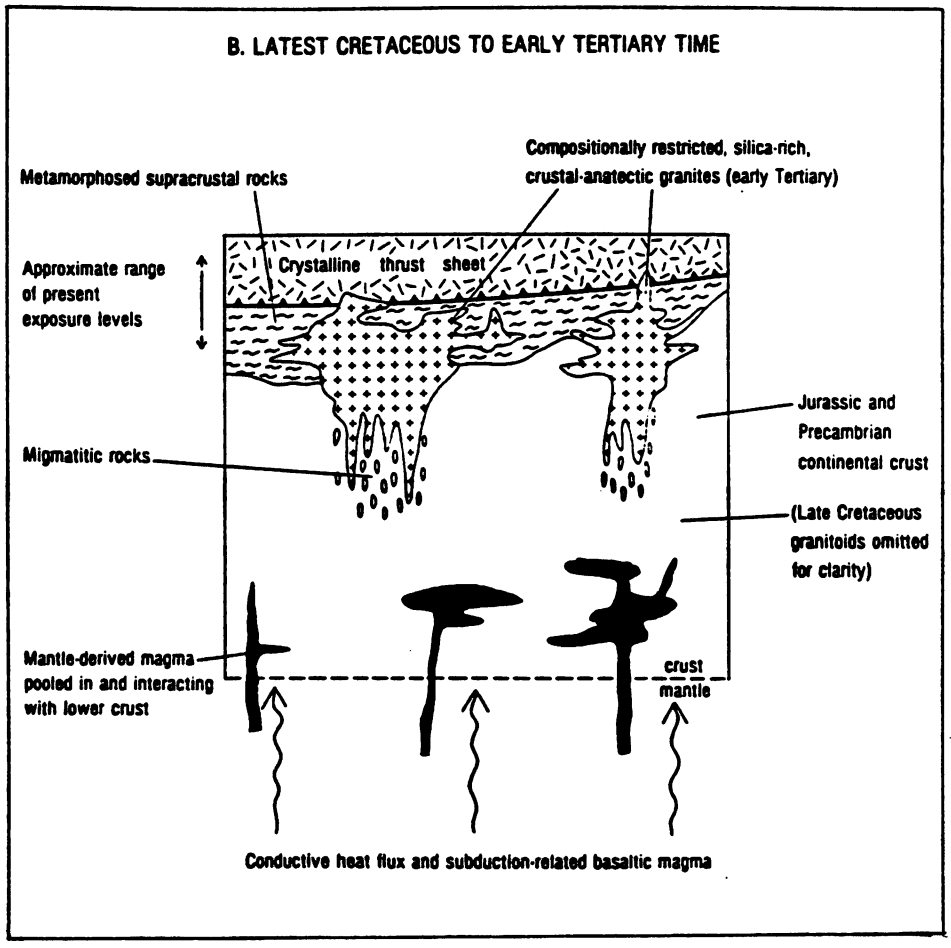

B. LATEST CRETACEOUS TO EARLY TERTIARY TIME
Compositionally restricted, silica-rich, crustal-anatectic granites (early Tertiary)
Metamorphosed supracrustal rocks
Crystalline thrust sheet
Approximate range of present exposure levels
Jurassic and Precambrian continental crust
Migmatitic rocks
(Late Cretaceous granitoids omitted for clarity)
Mantle-derived magma pooled in and interacting with lower crust
crust
mantle
Conductive heat flux and subduction-related basaltic magma

fig. 4

Mineralization and Alteration

Three distinct types of gold-silver mineralization (with minor amounts of accompanying base metals) have been recognized:

1. Gold-silver mineralization associated with iron oxides disseminated throughout brecciated granitic rocks. These bodies are developed along the low angle fault contact between the granitic intrusive and overlying reactive host rocks. Thickness in excess of 20' averaging 1/2 oz./ton gold were exposed during 1930-31. This type of mineralization has potential for discovery of large tonnage ore reserves of substantial grade.
2. The location of number E-W and NW trending zones of stockwork quartz veining which cut fractured quartz monzonite in the vicinity of the San Luis Mine are shown on fig. 5. These zones vary in width, have wide sericite K-spar alteration envelopes, and contain varying amounts of limonite. This type of mineralization has potential for discovery of large tonnage reserves of low grade ore.
3. Fissure veins development in the andesites which strike N80E and dip 35° to 40° to the north. All previous lode mining activity has focused upon this type of mineralization. While these high grade deposits are historically important, the potential for developing large tonnage reserves is unlikely.

Prospect Evaluation
Historic Mine Data

The San Luis Mine has been the scene of mining activity in the past, but no reliable reports or statistics from the active period between 1901 and 1914 have been located. The 1930 report by Libbey & Harper put forward recommendations for exploration and development work, some of which was carried out between February and June, 1931. The results of that program are the basis of the 1931 Harper Report. Unfortunately, none of the underground maps which accompanied this report can be located. In this report Harper refers to the occurrence of two distinct types of mineralization:

1. High grade fissure quartz veins in the andesite which have been the focus of all previous mining activity.
2. Disseminated ore "throughout bodies of brecciated granodiorite...along the diorite and granite contact."

Most of the underground workings are inaccessible due to caving and the only known maps of the underground workings are incomplete.

Reconnaissance
Surface Sampling

A reconnaissance soil sampling survey (fig. 6) with north to northeast trending lines spaced at 1,000" intervals (sample interval = 100') resulted in numerous broad gold anomalies which outline zones of stockwork quartz veining. The contact zone between

the andesite and granite is also anomalous. However, wide-spread thin (partially cemented) alluvial cover along the contact and adjacent to zones of stockwork quartz veining make them difficult to map and sample.

Follow up reconnaissance rock chip sampling in arroyos where bedrock is exposed further defined the gold bearing zones (fig. 7). All soil and rock chip samples were analyzed by Skyline Labs.

Reconnaissance Subsurface Sampling

An airtrack power by a 600 cfm-125 psi compressor was used to drill twenty (2 1/2" diameter) shallow test holes. Depth of the holes was limited by the moisture content of fracture zones which resulted in the compaction of drilling cuttings in the hole. Samples were collected over 12' intervals, split, and sent to Skyline Labs in Tucson for analysis by atomic absorption spectroscopy. Although the small diameter hole and limited air-pressure render this technique inadequate for accurate grade determination, it is effective in determining the presence or absence of gold. The results were as follows:

21 intervals ran between .04 and .10 ppm Au

8 intervals ran between .11 and .50 ppm Au

1 interval ran between .51 and 1.00 ppm Au

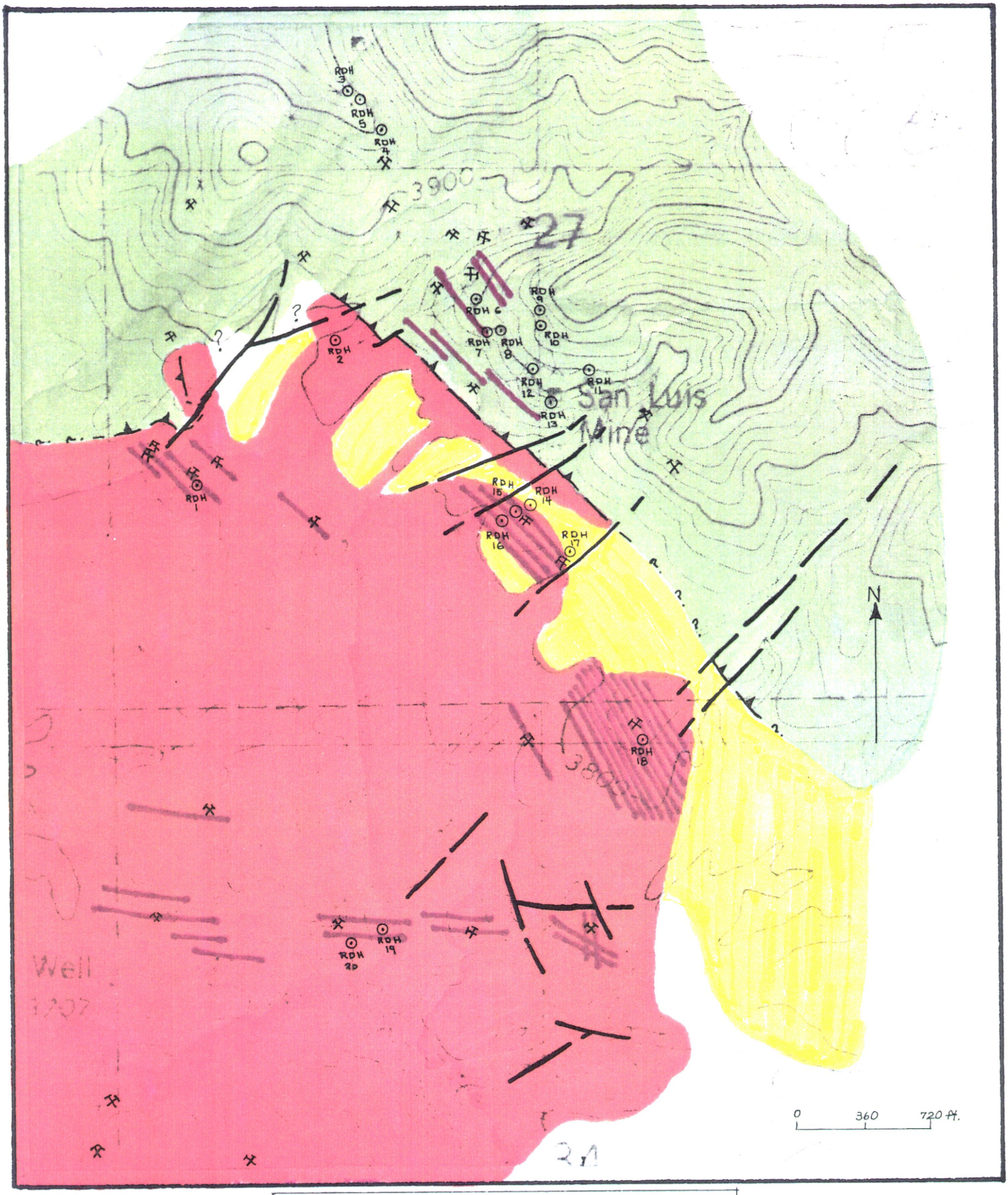
1 interval ran over 1ppm Au (a two assay ton fire assay ran .075 oz./ton Au)

Thirty one of a total of 167 drill samples, or 18% contained anomalous gold mineralization.

Bibliography

— Haxel, G..B, et al, 1984, Latest Cretaceous and early Tertiary orogenesis in south-central Arizona: Thrust faulting, regional metamorphism, and granitic plutonism, G.S.A. Bulletin V. 95, p631-653.

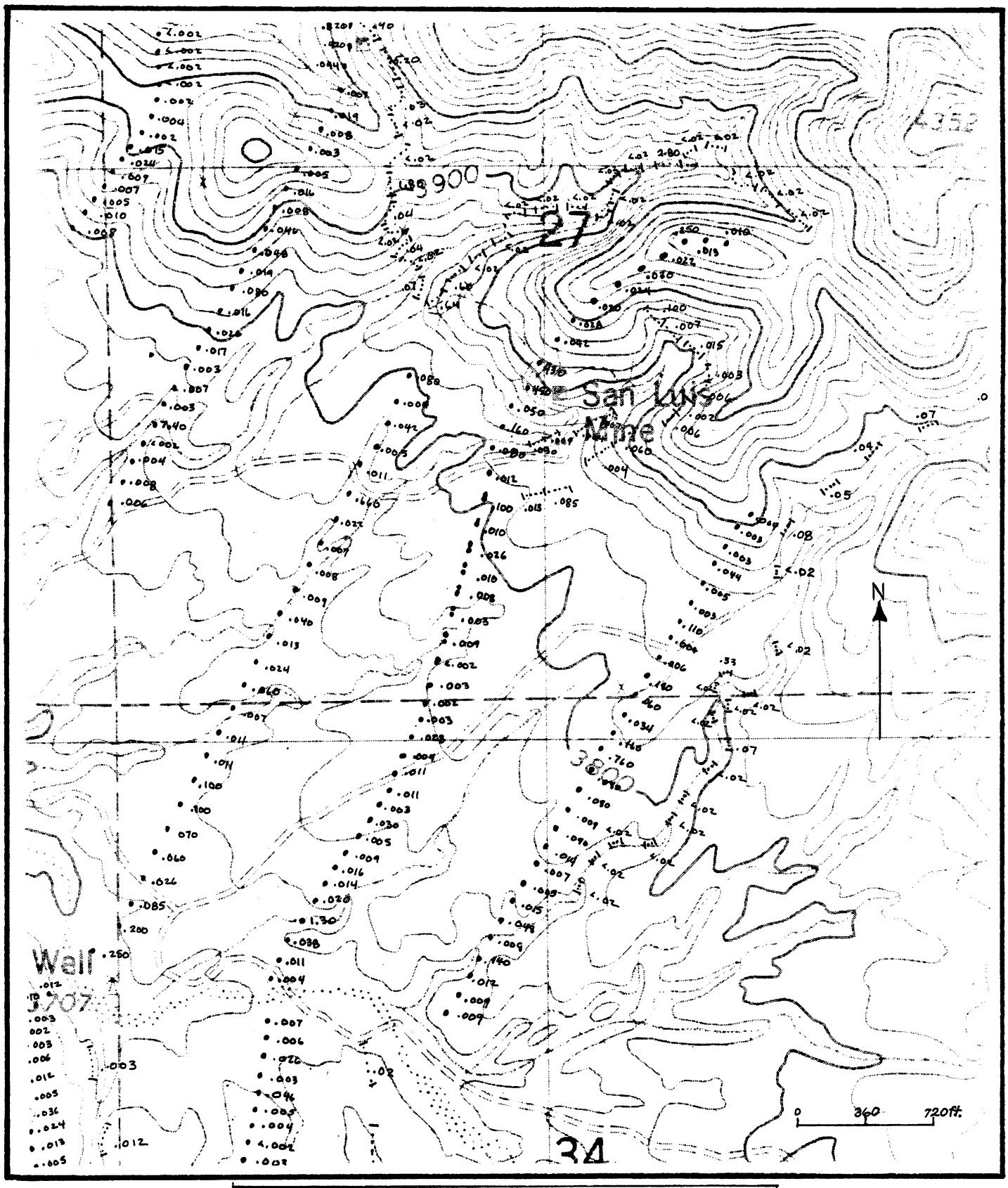
— Keith, W. J. and Theodore, T.G., 1975, Reconnaissance Geologic Map of the Arivaca Quadrangle, USGS Misc. Field Studies Map MF-678



GEOLOGY OF THE SAN LUIS MINE AREA

Qg	gravel
TKqm	quartz monzonite
Mza	andesite
	fault
?	thrust fault
	prospect
	drill hole
	quartz veining

fig. 5

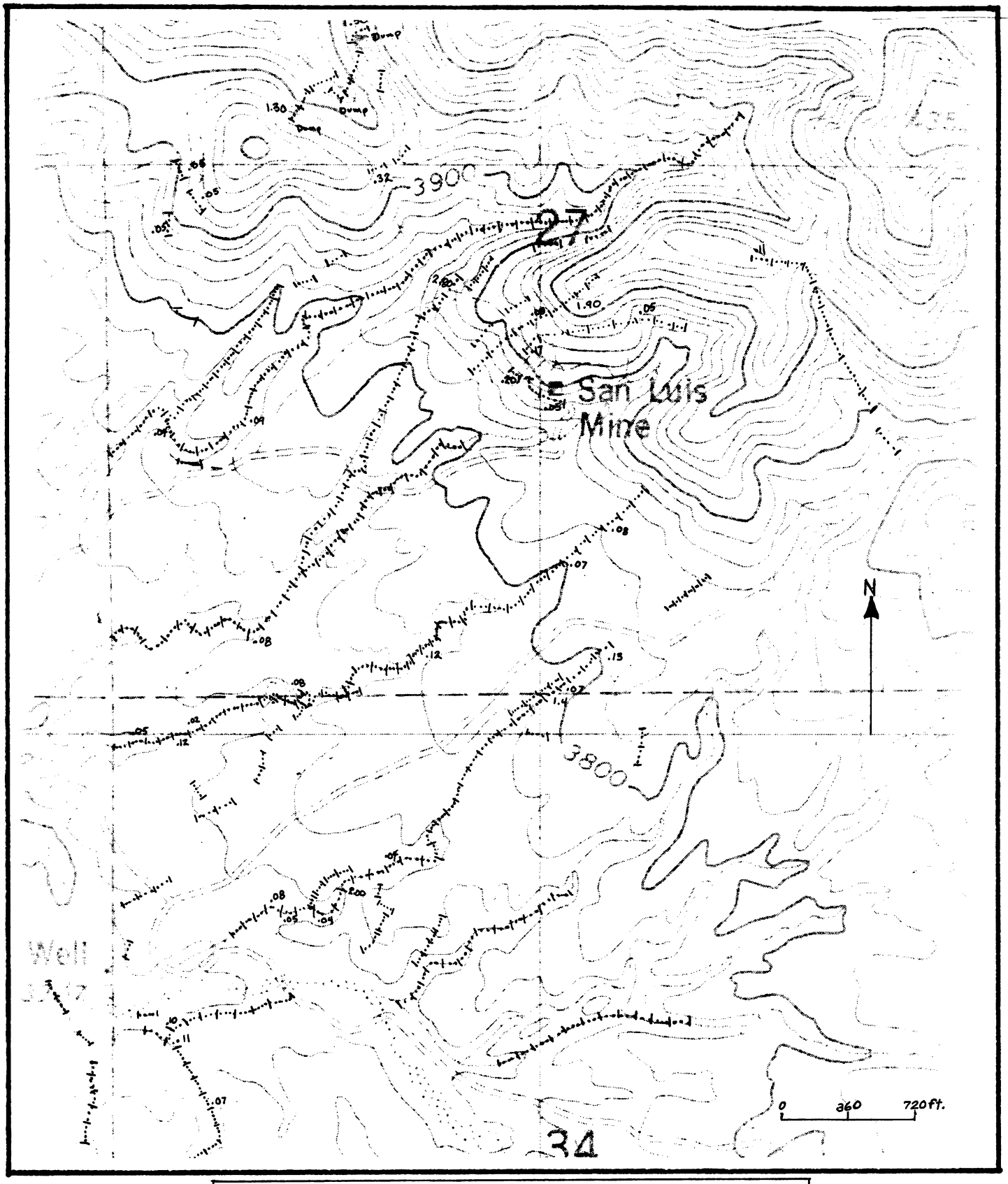


SAN LUIS PROSPECT SOIL SAMPLE SURVEY

• soil sample location - Au values in ppb

|···| float and outcrop sample location – Au values in ppm

fig. 6



SAN LUIS PROSPECT ROCK CHIP SAMPLE SURVEY

|...| sample location - values <.02 not posted

fig. 7