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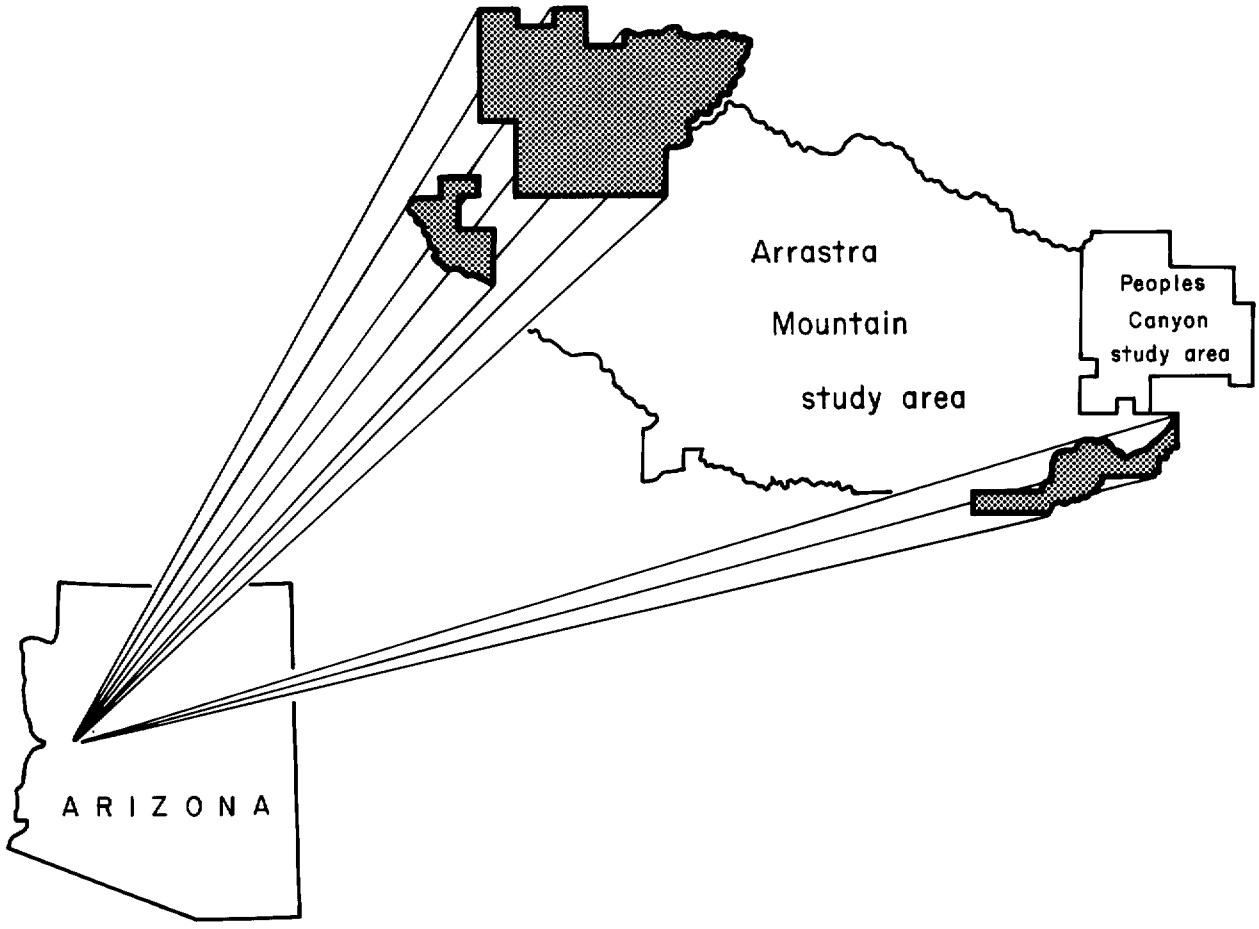
Mineral Land Assessment
Open File Report/1988

Mineral Investigation of additional parts of the Arrastra Mountain study area (AZ-020-059), La Paz, Mohave, and Yavapai Counties, Arizona



BUREAU OF MINES
UNITED STATES DEPARTMENT OF THE INTERIOR

MINERAL INVESTIGATION OF ADDITIONAL PARTS OF THE ARRASTRA MOUNTAIN WILDERNESS STUDY AREA (AZ-020-059), LA PAZ, MOHAVE, AND YAVAPAI COUNTIES, ARIZONA

by

Michael E. Lane

MLA 25-88
1988

Intermountain Field Operations Center
Denver, Colorado

UNITED STATES DEPARTMENT OF THE INTERIOR
Donald P. Hodel, Secretary

BUREAU OF MINES
TS Ary, Director

PREFACE

The Federal Land Policy and Management Act of 1976 (Public Law 94-579) requires the U.S. Geological Survey and the U.S. Bureau of Mines to conduct mineral surveys on certain areas to determine the mineral values, if any, that may be present. Results must be made available to the public and be submitted to the President and the Congress. This report presents the results of a mineral survey of additional parts of the Arrastra Mountain Wilderness Study Area (AZ-020-059), La Paz, Mohave, and Yavapai Counties, Arizona.

This open-file report summarizes the results of a Bureau of Mines wilderness study. The report is preliminary and has not been edited or reviewed for conformity with the Bureau of Mines editorial standards. This study was conducted by personnel from the Branch of Mineral Land Assessment (MLA), Intermountain Field Operations Center, P.O. Box 25086, Denver Federal Center, Denver, CO 80225.

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ILLUSTRATIONS

ILLUSTRATIONS--Continued

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UNITS OF MEASURE ABBREVIATIONS USED IN THIS REPORT

ft	foot
in.	inch
<	less than
mi	mile
oz	ounce
ppb	part per billion
ppm	part per million
%	percent
lb	pound
oz/t	troy ounce per short ton (2,000 pounds)

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by

Michael E. Lane, U.S. Bureau of Mines

SUMMARY

From April to June 1987, the Bureau of Mines conducted a mineral investigation of 20,428 acres of the Arrastra Mountain Wilderness Study Area in La Paz, Mohave, and Yavapai Counties, west-central Arizona. This acreage is a total of three separate parcels adjacent to the north, west, and southeast boundaries of the 89,095-acre parcel of the wilderness study area studied in 1984. Both studies were requested by the Bureau of Land Management and authorized by the Federal Land Policy and Management Act of 1976 (Public Law 94-579).

Very little prospecting has occurred in the additions; however, much has occurred within 1 mi. During the present study, a total of 116 samples was taken but only 2 were from the additions. Several samples taken outside the additions contained significant gold; most contained thorium and uranium. No metallic mineral resources were identified in the wilderness study area additions, however an indicated subeconomic resource of about 340 tons containing 0.372 oz gold/t was identified in the original Arrastra Mountain study area. More detailed field work, including subsurface sampling, might identify additional gold resources in that area.

High gold concentrations were found in several samples taken across faults and quartz veins within 3/4 mi of the west addition. It is possible that similar faults and veins containing gold exist in the additions; but no surface evidence of this was found during the investigation.

The Chapin Wash Formation, which is known to be uranium-bearing, extends into the southeast addition; subsurface sampling would be necessary to identify resources that may exist. The Anderson Mine, about 1 mi southeast of the area, has produced uranium from this formation.

Subeconomic inferred resources of sand and gravel occur in dry washes and river beds in all three additions. The material is not close to existing markets; similar material can be found in abundance closer to local markets. Therefore, development of this resource is unlikely.

INTRODUCTION

From April to June 1987, the Bureau of Mines, in a cooperative program with the U.S. Geological Survey (USGS), studied the mineral occurrences of three parcels (pl. 1) of the Arrastra Mountain study area, La Paz, Mohave, and Yavapai Counties, Arizona, on lands administered by the Bureau of Land Management (BLM), Phoenix District Office, Arizona. These parcels are adjacent to the north, west and southeast boundaries of an 89,095-acre portion of the Arrastra Mountain Wilderness Study Area studies by the Bureau in 1984 (Lane, 1985). The additional areas total 20,428 and are referred to in this report as the north, west, and southeast additions.

The Bureau surveys and studies mines, prospects, and mineralized areas to appraise reserves and identified mineral resources. The USGS assesses the potential for undiscovered mineral resources based on regional geological, geochemical, and geophysical surveys. This report presents the results of the Bureau of Mines study that was completed prior to the USGS investigation. The USGS will publish the results of their studies. A joint USGS-Bureau report, to be published by the USGS, will integrate and summarize the results of these studies.

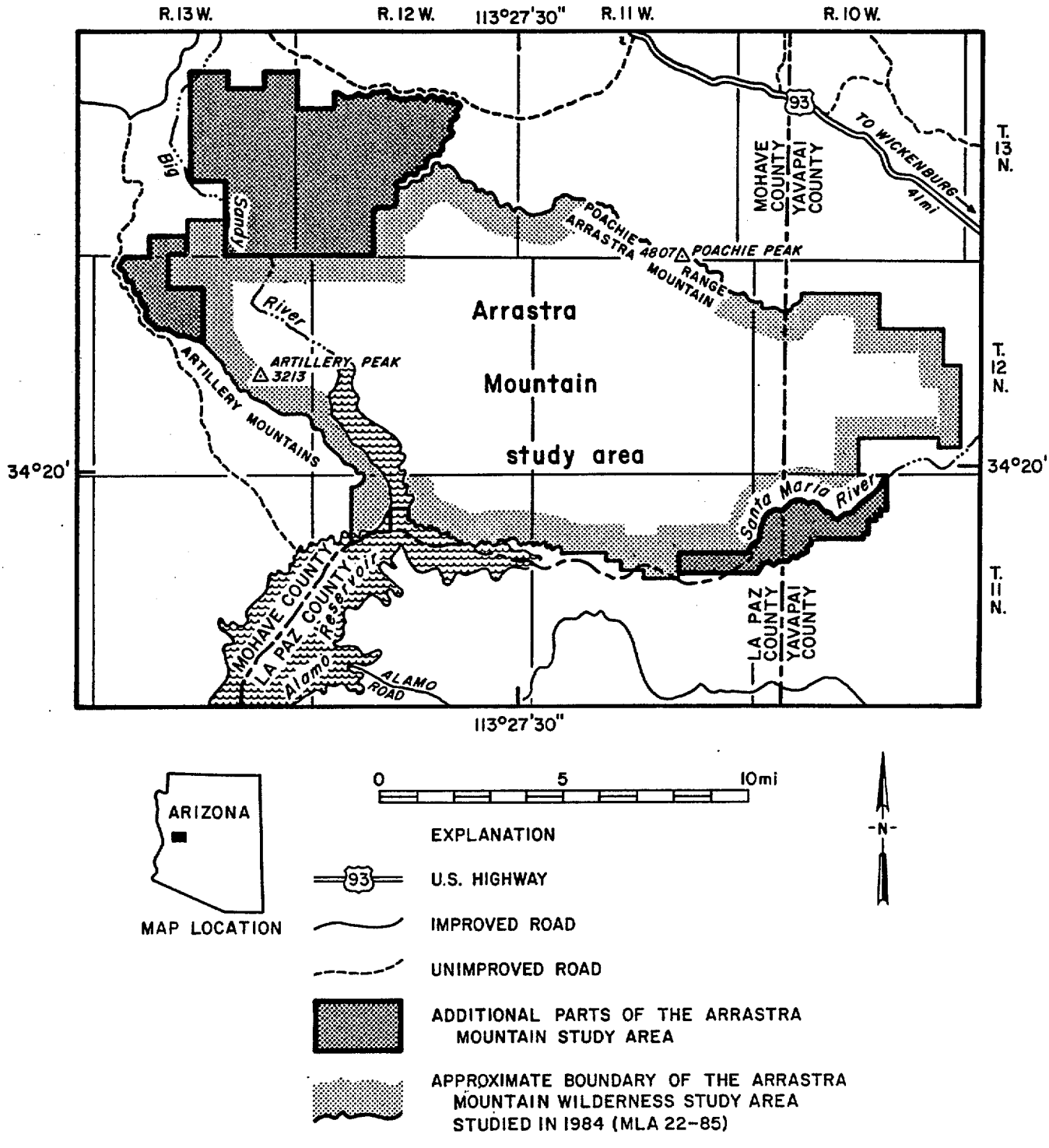

Figure 1.--Index map of additional parts of the Arrastra Mountain Wilderness Study Area, La Paz, Mohave, and Yavapai Counties, Arizona.

Geographic setting

The additions are in west-central Arizona in La Paz, Mohave, and Yavapai Counties (fig. 1) and about 40 mi northwest of Wickenburg, and about 55 mi southeast of Kingman and southwest of U.S. Highway 93.

Access to the north and west additions is by unpaved roads that connect with U.S. Highway 93. The southeast addition is accessible from Alamo Road, which connects U.S. Highway 93 and Alamo Reservoir.

Elevations range from 3,486 ft near the north addition to about 1,400 ft on the Santa Maria River in the southeast addition. The terrain is mountainous and typical of the desert southwest. Vegetation consists of cacti, grasses, and desert trees. Temperatures exceed 110 degrees in summer and drop below freezing in winter.

Method of investigation

Bureau personnel reviewed literature concerning mining and geology of the region. In addition, BLM records were reviewed for mining claim information and oil and gas leases and lease applications. Mining claim locations are shown on plate 1. One patented lode claim (State Mine) and millsite claim was found about 1 mi north of the north addition (pl. 1).

Two Bureau geologists spent 28 days completing the field examination in and near the additions. Surface and accessible underground workings were surveyed by compass and tape, mapped, and sampled. Figures 2-10 are maps of workings and sample localities. Tables 1-3 show data for samples taken.

A total of 116 samples (pl. 1) was taken during the field investigation; 2 samples were taken within the additions and the remainder within 1 mi of the additions. Chip samples were taken across geologic structures or at outcrops that were possibly mineralized. All samples were analyzed for 26 elements,

including gold and silver, by neutron activation; selected samples were analyzed for thorium by X-ray fluorescence, for uranium fluorimetrically, and for gold by fire assay. Analyses were done by Bondar-Clegg and Company, Lakewood, CO. Complete analytical data for all samples are available for public inspection at the Bureau of Mines, Intermountain Field Operations Center, Building 20, Denver Federal Center, Denver, CO.

Previous studies

Otton (1977), Sherborne and others (1979), and Mueller and Halbach (1983) extensively studied uranium occurrences near the southeast addition at the Anderson Mine. Lane (1985) conducted a mineral investigation of a part of the Arrastra Mountain and Peoples Canyon study areas for the Bureau of Mines. This report concerns three additional areas adjacent to that studied by Lane (1985) (fig. 1).

Geologic setting

The additions are in the northern part of the Basin and Range physiographic province; the north and west additions consist mostly of Precambrian-age granites, gneisses, and schists that contain gold-bearing faults and quartz veins (Lane, 1985). In the southeast addition, near the Anderson Mine, uranium-bearing sedimentary rocks of the Miocene-age Chapin Wash Formation crop out.

Anomalously high thorium and uranium concentrations are found in the Precambrian rocks in this region. This may be one source of uranium mineralization in the Chapin Wash Formation. The Chapin Wash Formation is fossiliferous and may be correlative with the manganiferous Artillery Formation which crops out south of the west addition.

MINING HISTORY AND LEASING ACTIVITY

No production records for the additions were found. The field investigation showed no indication of production. The Artillery mining district (Artillery Peak district), which contains some of the largest reserves of low-grade manganese in the United States (Lane, 1985), is about 6 mi south and southwest of the west addition. Manganese mining began about 1917 and continued intermittently until 1955 (Farnham and Stewart, 1958, p. 25). About 95,108,000 lb of manganese was mined from the Artillery Peak mining district from 1946 to 1959 (Keith and others, 1983, p. 17). Manganese resources were found in the Arrastra Mountain study area (Lane, 1985, p. 6) in the Artillery and Chapin Wash Formations. During this investigation, no manganese was found in the three additions.

The Anderson Mine, about 1 mi southeast of the southeast addition, consists of extensive surface excavations. Sherborne and others (1979, p. 625) state that 10,758 tons of ore containing 33,230 lb of U_3O_8 (uranium oxide) was mined. The deposits were discovered in 1955 by T. R. Anderson during an airborne scintillometer survey (Peirce, 1977, p. 3). The deposit was formed by ground-water process in lacustrine sediments of the Chapin Wash Formation (Anderson Mine Member). The uranium occurs in isolated irregular-shaped bodies (Mueller and Halbach, 1983, p. 290).

Gold has been mined from quartz veins about 2 mi east of the southeast addition in the Crosby (Eureka) mining district. Bureau of Mines records indicate that 322 oz gold, 133 oz silver, 825 lb lead, and 140 lb copper were produced between 1935 and 1942 from the Homestake, Big Stick, and Weepah Mines in this district.

Much of the additions is covered by oil and gas leases (Lane, 1985, pl. 2); however, Ryder (1983) rated hydrocarbon potential as low to zero because the area is underlain by gneiss, granite, and schist.

APPRAISAL OF SITES EXAMINED

One hundred sixteen samples were taken at 32 pits, 13 adits, 6 shafts, and 3 trenches (pl. 1); 2 samples (115, 116) were from along the east boundary of the original study area, the rest from 3 areas shown on plate 1. Information on samples is summarized in table 3. A short adit and prospect pit (samples 105, 106) were the only workings found in the additions and there was no evidence of production. Sample 105 contained 17 ppb gold and was taken in a pegmatite lens in schist. Sample 106 contained 0.112 oz gold/t and was taken across a vertical fault in granite; no resources could be identified because of the limited exposure of the fault.

Samples 1-50 were taken adjacent to the west addition mostly across faults and quartz veins. Several samples contained significant gold (table 1; figures 2, 3, 8). All but two structures that contained significant gold, if projected, would not extend into the addition. The two structures that strike toward the addition would have to extend for about 3/4 mi to intersect the boundary, but they could not be traced that far.

Gold was detected (70 ppb to 0.776 oz/t) in all samples taken at workings in sec. 3, T. 12 N., R. 13 W. (samples 51-63). The workings expose quartz veins and associated faults in gneiss. An indicated subeconomic resource of 340 tons averaging 0.372 oz gold/t occurs about 1/2 mi outside the west addition; this resource is in the original Arrastra Mountain study area. Additional mineral resources could exist but subsurface sampling would be required to determine this.

Samples 64-114 were taken near Greenwood Spring in and within 1 mi of the north addition. Samples 105 and 106 were taken in this addition along the north boundary; the rest were within 1 mi of the boundary. Most samples were taken across faults and quartz veins that strike northwest to northeast. Projected on strike, most of these structures would intersect the north addition in 1/4 to 1 mi. However, the structures could not be traced into the addition.

Thorium and uranium were detected in all the samples, but most concentrations were less than 30 ppm thorium and 15 ppm uranium. The highest concentrations were at the State Mine (samples 108-114). The range of thorium concentration was from 13 ppm to 3,360 ppm (0.336%) and the range of uranium concentration was from 36 ppm to 820 ppm (0.082%). Most concentrations were low and do not constitute a resource.

Uranium occurrences in the Chapin Wash Formation (Anderson Mine Member) exist near the southeastern boundary of the southeast addition at the Anderson Mine. Three samples taken by Lane (1985, samples 1-3) are from along the boundary of the southeast addition. These samples contained 1,298 (0.13%), 1,888 (0.19%), and 2,419 ppm (0.24%) U_3O_8, respectively. These were surface samples and subsurface grade may be different. These grades are equivalent or higher than grades mined from the Anderson Mine but are lower than those currently being mined elsewhere. At the current price of uranium ($16/lb) these grades are not economical. However, if higher grades and sufficient tonnage were found and the price of uranium increased, the deposit may become an identified resource. Any mining of resources from the addition would most likely be done in conjunction with mining the deposits of the Anderson Mine. Subsurface sampling would be needed to accurately define any resources.

Sand and gravel

Inferred subeconomic resources of sand and gravel occur in dry washes and river beds in all three additions. The material is not close to existing markets; similar material can be found in abundance closer to local markets. Therefore, development in the additions is unlikely.

CONCLUSIONS

No metallic mineral resources were identified in the additions. Gold could occur in the additions in faults and quartz veins but subsurface sampling would be needed to determine this.

Thorium and uranium detected in samples taken outside the north addition are inherent in the country rock but in concentrations too low (<30 ppm Th and <15 ppm U) to constitute a resource; field data did not indicate that resources occur in the addition. Field data indicate that uranium could occur in the southeast addition but subsurface sampling would be needed to identify resources.

Identified sand and gravel resources are found in the additions but similar material can be found closer to markets.

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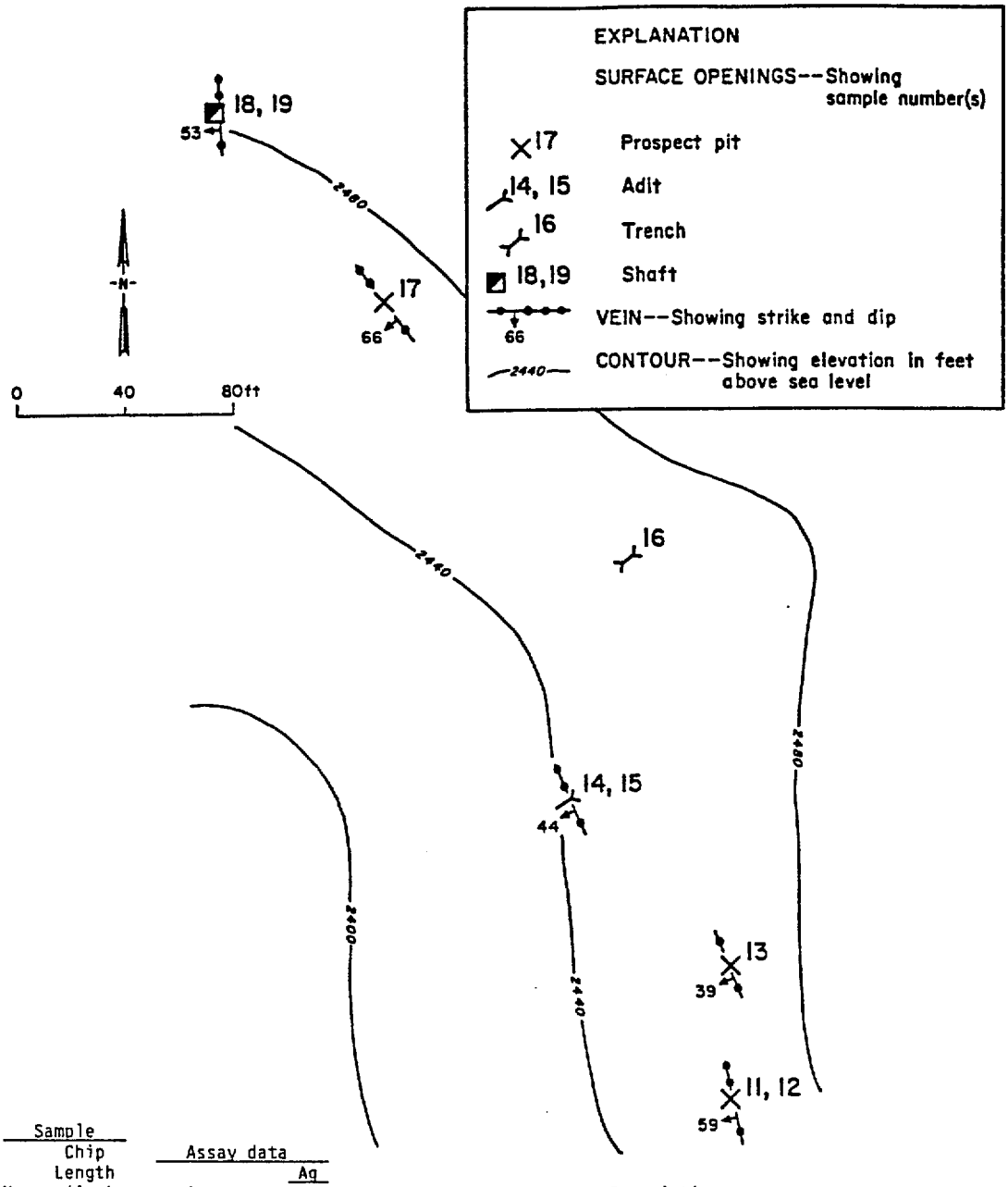
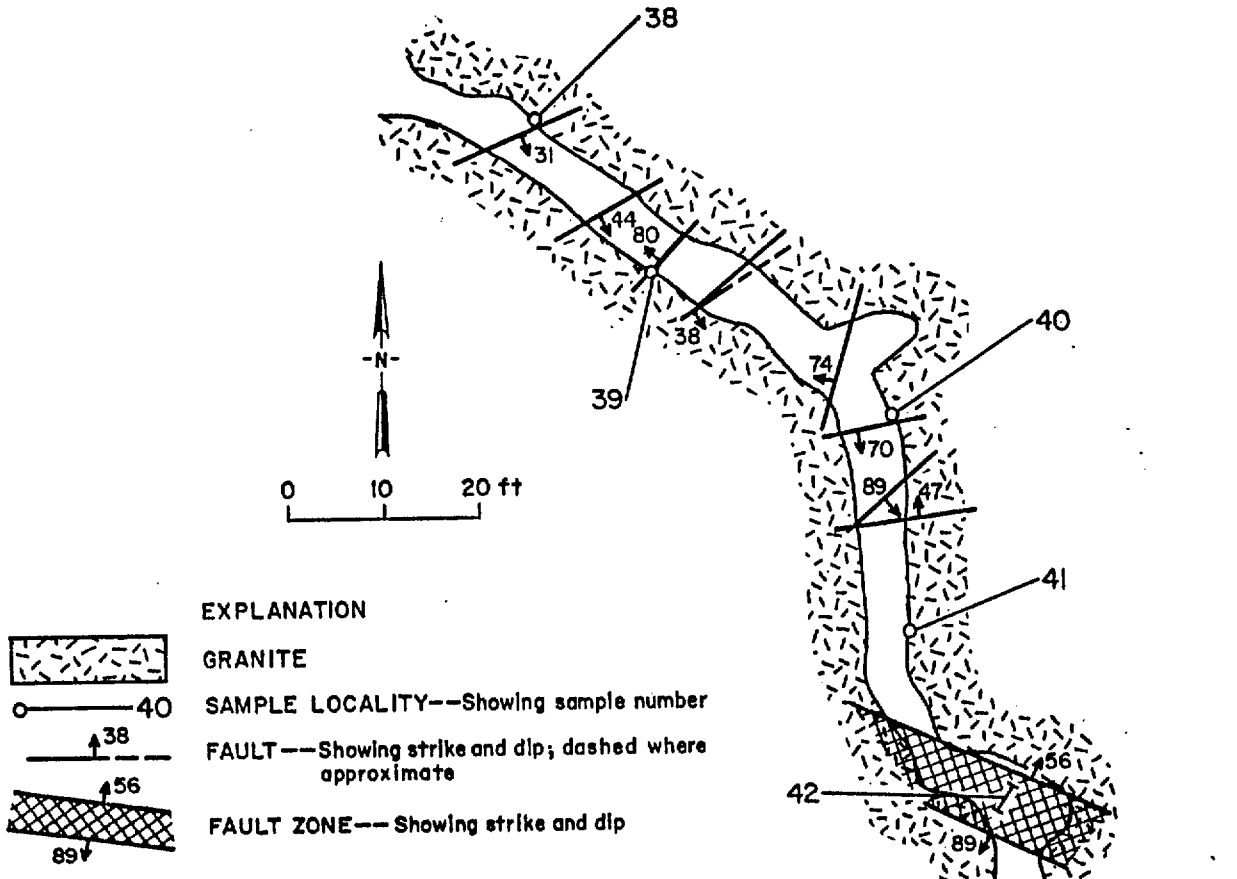


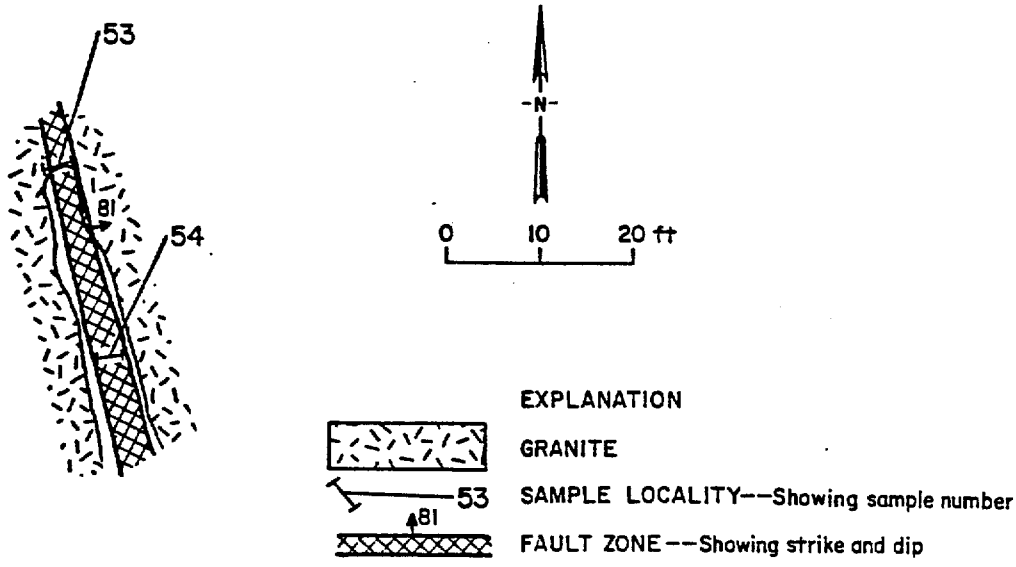
Sample No.	Chip Length (in.)	Assay data Au	Assay data Ag ppm	Description
11	9	0.044 oz/t	<5	Quartz vein; abundant hematite; granite country rock.
12	10	.642 oz/t	<5	Quartz vein; granite country rock.
13	11	350 ppb	<5	Quartz vein; granite country rock with plagioclase phenocrysts.
14	20	.059 oz/t	<5	Quartz vein; granite country rock.
15	35	1.030 oz/t	15	Do.
16	25	.083 oz/t	<5	Quartz vein; granite country rock.
17	8	.140 oz/t	7	Quartz vein; sparse pyrite; granite country rock.
18	23	410 ppb	<5	Quartz vein; granite country rock.
19	12	.033 oz/t	<5	Same quartz vein as sample 17 and 18; granite country rock.

Figure 2.--Surface map showing analytical data for, and localities of samples 11-19.



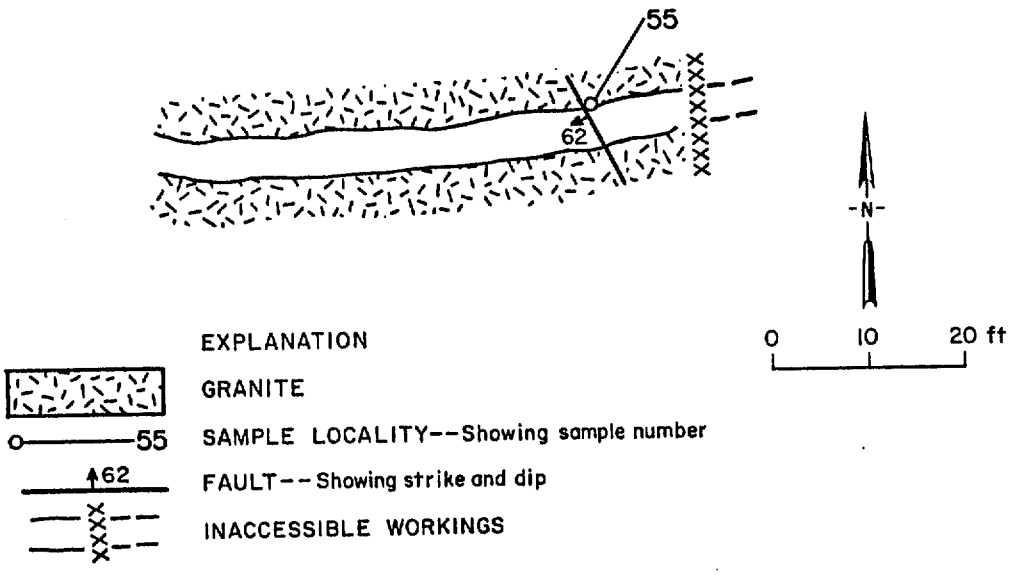
Sample No.	Chip length (in.)	Assay data Au ppb	Ag	Ba ppm	Th	Remarks
38	7	39	<5	1,100	23	Clay gouge; 1-in.-wide quartz stringer.
39	20	27	<5	1,400	92	Fault gouge.
40	13	8	<5	400	23	Fractured granite.
41	16	27	<5	700	24	Do.
42	52	14	<5	1,800	16	Fault gouge; clay.
43	12	9	<5	690	29	Do.
44	15	18	<5	930	22	Do.
45	4	37	7	920	83	Do.

Figure 3.--Mine map showing analytical data for, and localities of samples 38-45.



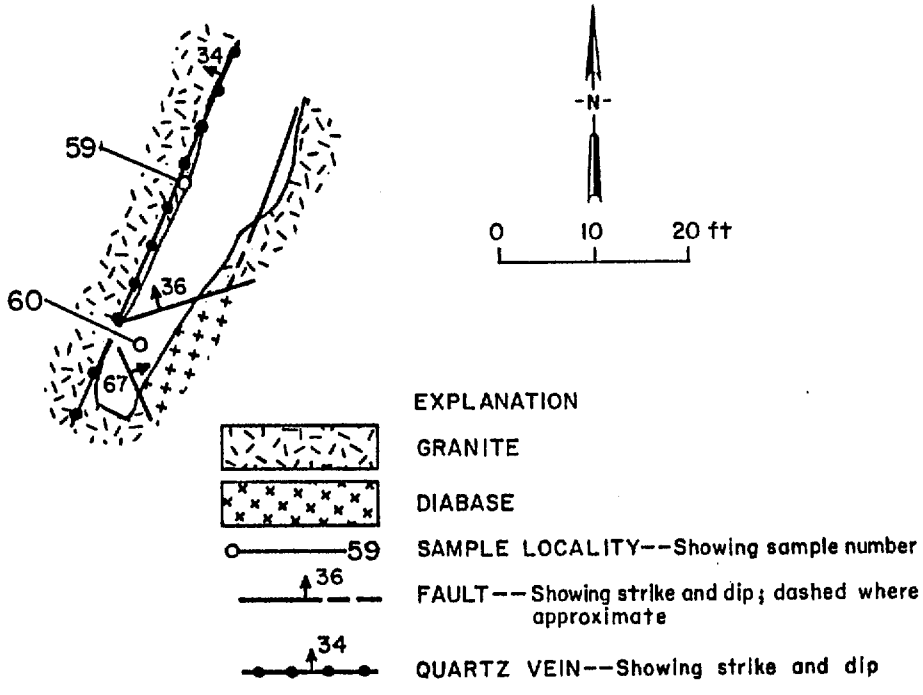
Sample No.	Chip length (in.)	Assay data: Au oz/t	Assay data: Ag ppm	Assay data: Other ppm	Description
53	20	0.299	7		Quartz vein; granite country rock.
54	36	.766	7	Ba, 1,000	Quartz vein in fault; sheared, altered granite country rock.

Figure 4.--Mine map showing analytical data for, and localities of samples 53-54.



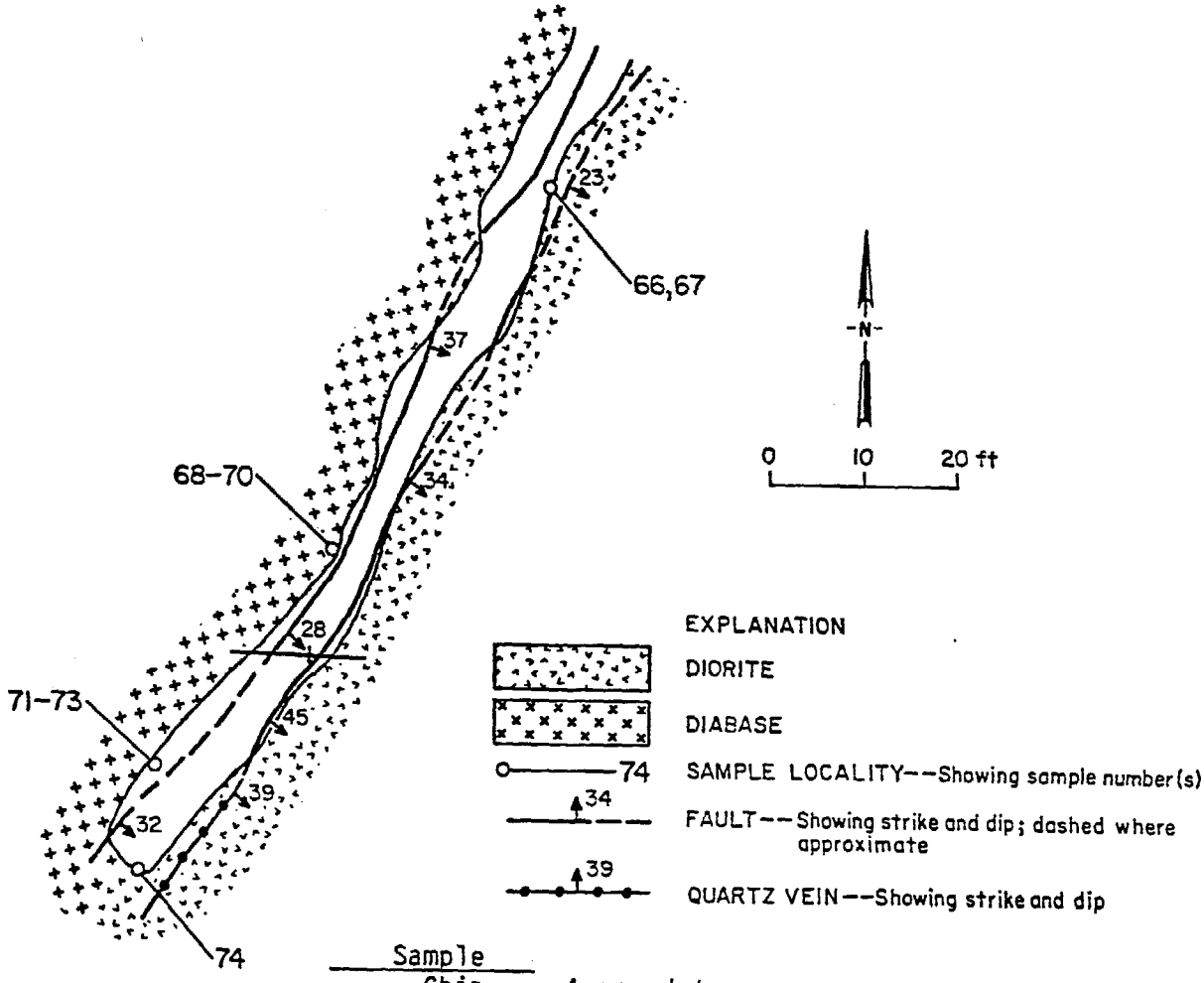
Sample No.	Chip length (in.)	Assay data Au ppb	Ag ppm	Other ppm	Description
55	3.5	70	<5	Ba, 1000	Fault; granite country rock.

Figure 5.--Mine map showing analytical data for, and locality of sample 55.



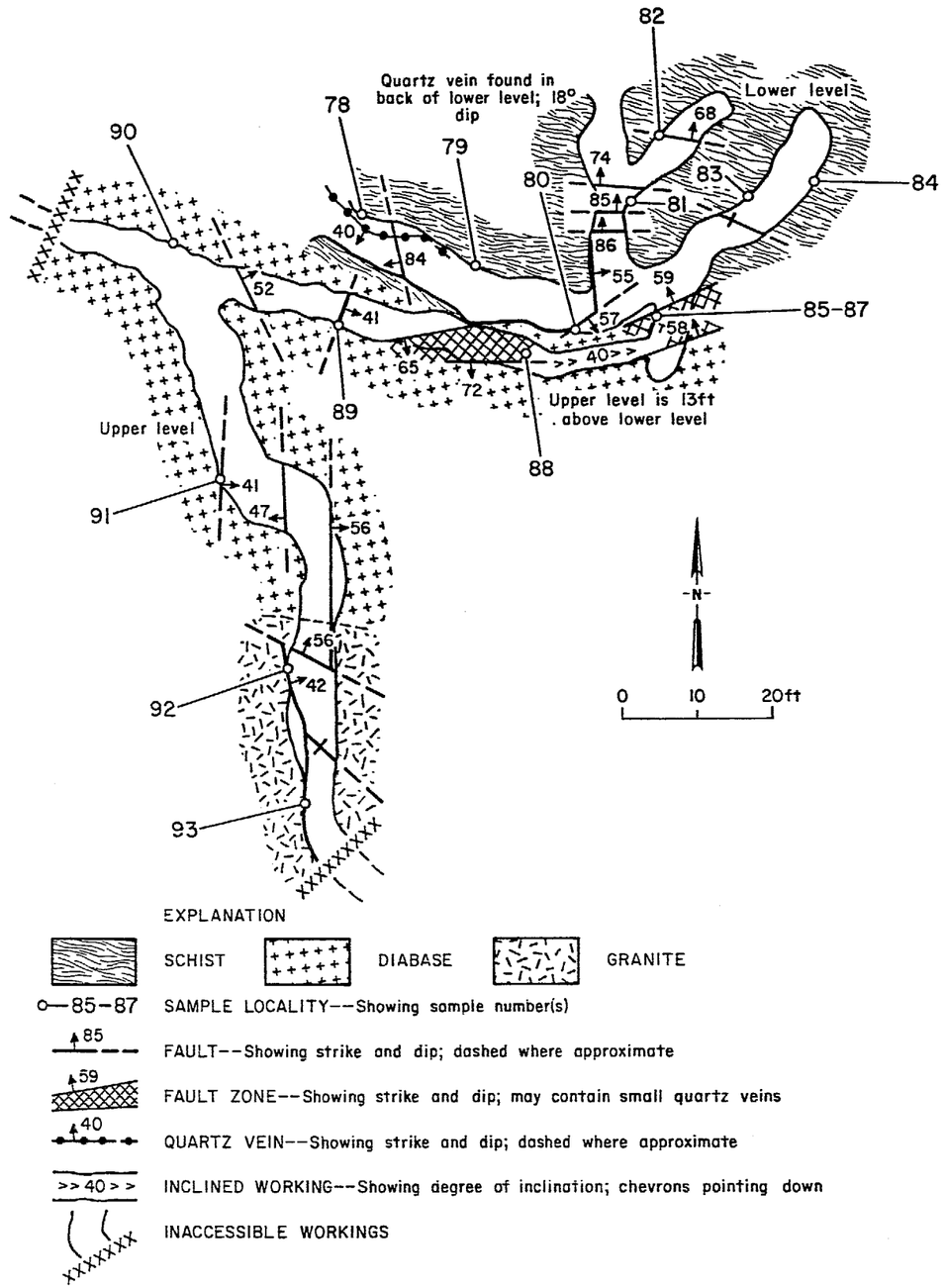
Sample No.	Chip length (in.)	Assay data Au oz/t or ppb	Assay data Ag ppm	Description
59	12	0.028 oz/t	<5	Quartz vein; granite country rock.
60	13	170 ppb	<5	Do.

Figure 6.--Mine map showing analytical data for, and localities of samples 59-60.



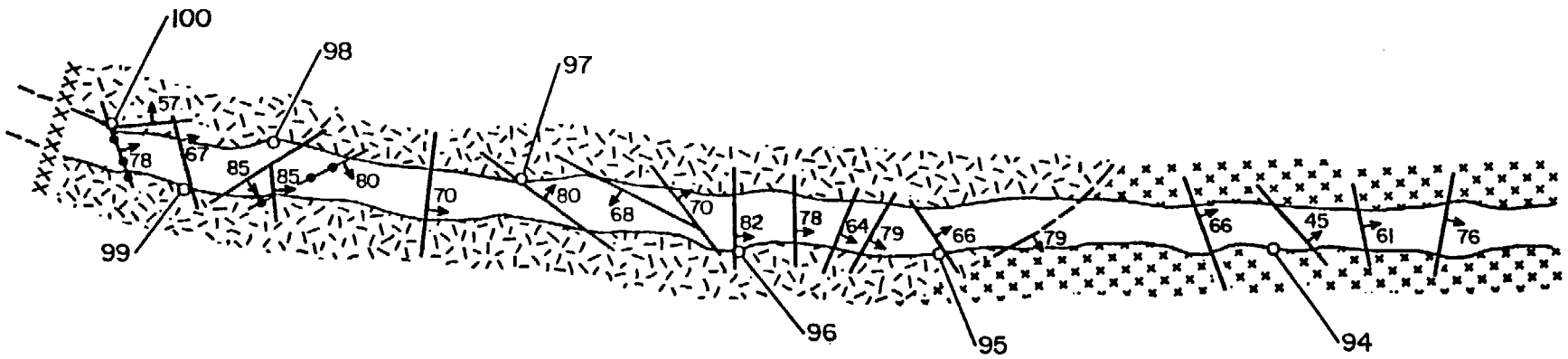
Sample No.	Chip length (in.)	Assay data Au ppb	Assay data Ag ppm	Description
66	13	22	<5	Fault.
67	45	15	<5	Do.
68	6	28	<5	Quartz vein along fault.
69	6	<5	<5	Fault.
70	7	28	<5	Do.
71	6	16	<5	Quartz vein along fault.
72	10	330	<5	Fault.
73	12	20	<5	Do.
74	10	53	<5	Quartz vein and fault.

Figure 7.--Mine map showing analytical data for, and localities of samples 66-74.



Sample No.	Chip length (in.)	Assay data: Au oz/t or ppb	Assay data: Ag ppm	Assay data: Other ppm	Description
78	15	0.107 oz/t	<5		Fault containing quartz vein; pyrite.
79	11	1.020 oz/t	15		Quartz vein; pyrite, limonite, vuggy, boxwork.
80	6	.162 oz/t	17	Ba, 6,000	Fault; gouge, crushed granite.
81	6	.030 oz/t	<5		Quartz vein in back; strike N. 35° W., dip 18° SW.; abundant pyrite.
82	6	.135 oz/t	5		Do.
83	6	886 ppb	29		Do.
84	4	.317 oz/t	21		Do.
85	38	110 ppb	<5	Ba, 1,500	Fault; fault gouge, crushed gneiss; granite country rock.
86	30	410 ppb	<5	Ba, 1,200	Do.
87	6	.389 oz/t	26		Quartz vein in fault (samples 85 and 86); vuggy, minoe clay; granite country rock.
88	30	15 ppb	<5	Ba, 1,400	Fault gouge; indistinct hanging and footwall.
89	6	<5 ppb	<5	Ba, 1,700	Do.
90	36	<5 ppb	<5	Ba, 1,700	Do.
91	16	<5 ppb	<5	Ba, 1,800	Do.
92	16	<5 ppb	<5	Ba, 1,400	Do.
93	16	<5 ppb	<5	Ba, 1,700	Do.

Figure 8.--Mine map showing analytical data for, and localities of samples 78-93.



EXPLANATION

GRANITE

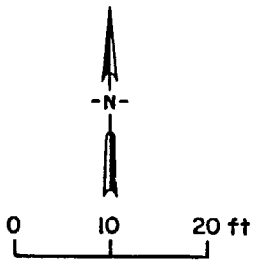
DIABASE

97 SAMPLE LOCALITY--Showing sample number

80 FAULT--Showing strike and dip; dashed where approximate

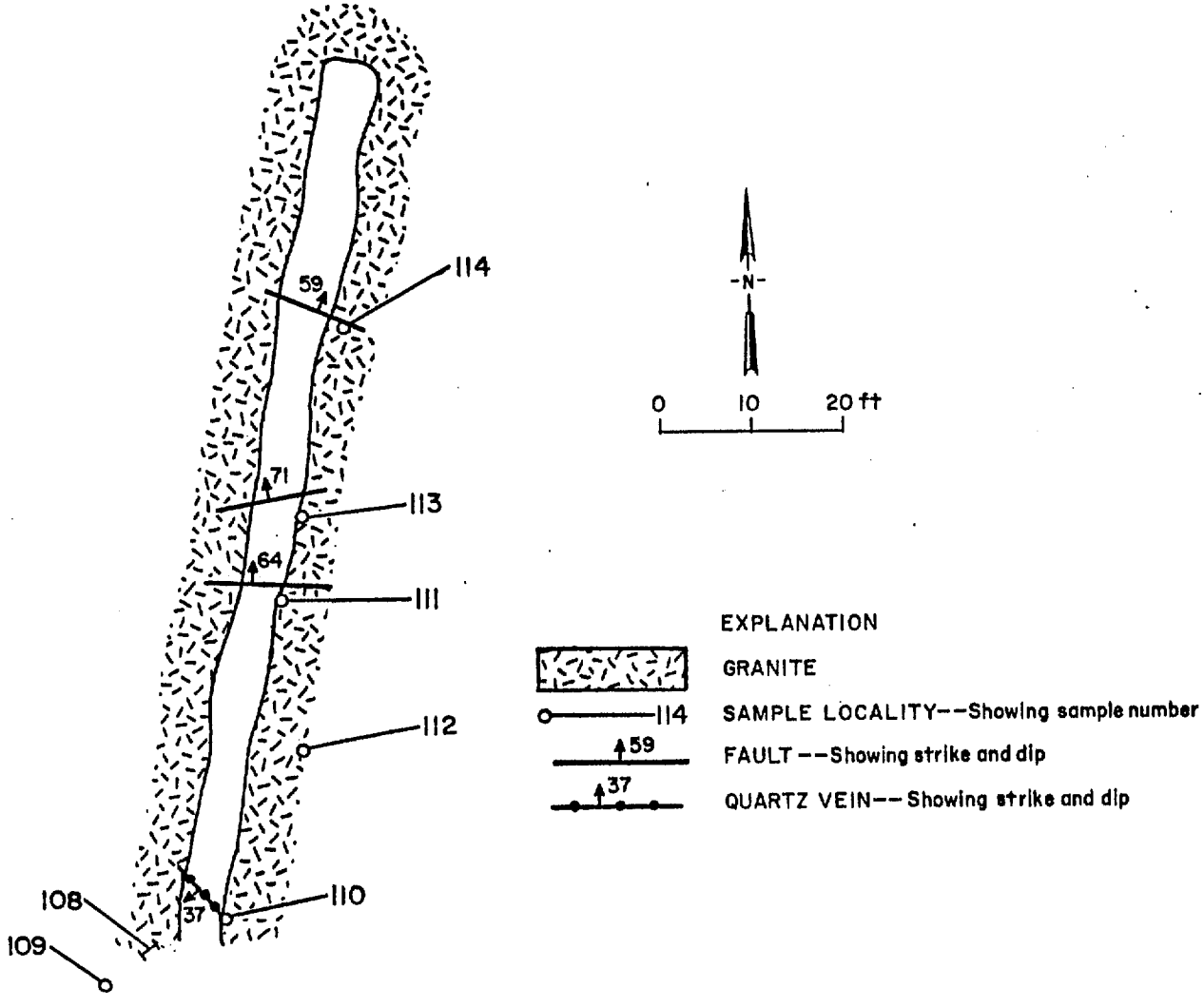
78 QUARTZ VEIN--Showing strike and dip

INACCESSIBLE WORKINGS



Sample No.	Chip length (in.)	Assay data Au ppb	Ag	Ba ppm	Th	Description
94	9	59	<5	970	5.8	Fault gouge.
95	22	12	<5	1,500	5.7	Fault gouge, calcite.
96	19	10	<5	1,600	7	Do.
97	11	<5	<5	1,300	12	Do.
98	13	<5	<5	2,000	6.9	Minor manganese, abundant hematite.
99	12	<5	<5	1,400	6.4	Gouge material, minor calcite.
100	6	<5	6	1,100	56.2	Quartz vein.

Figure 9.--Mine map showing analytical data for, and localities of samples 94-100.



Sample No.	Type	Length (in.)	Assay data Au ppb	Ag ppm, unless otherwise noted	Th ppm, unless otherwise noted	U ppm, unless otherwise noted	Description
108	Chip	27	67	<5	13	74	Fault; N. 85° E., 54° S.; gouge, granite country rock.
109	do.	36	26	<5	0.012%	36	Fault; N. 76° W., 46° SW.; gouge; altered granite country rock.
110	do.	36	44	7	.016%	42	Quartz vein, silicified, breccia.
111	do.	19	7	<5	.044%	64	Fault; clay gouge.
112	Grab	random	<27	<11	.336%	0.082%	Random sample of leached material on drift walls.
113	Chip	12	160	<5	.03%	83	Clay gouge, crusty "knobs" at fracture intersections.
114	do.	22	280	<5	.028%	58	Clay gouge.

Figure 10.--Map of State Mine, showing analytical data for, and localities of samples 108-114.

Table 1.--Miscellaneous mineral occurrences in and near additional parts of the Arrastra Mountain Wilderness Study Area, La Paz, Mohave, and Yavapai Counties, Arizona.

[Samples 105, 106, are in the study area; Au, gold; Ba, barium; Th, thorium; Zn, zinc; oz/t, ounce per ton; ppb, part per billion; part per million; %, percent; ppm, mi, mile.]

Map. No. (pl. 1)	Name (commodity)	Location	Summary	Workings	Sample data
1-21	Unnamed (Au)	Sec. 1, T. 12 N., R. 14 W. sec. 6, T. 12 N., R. 13 W. sec. 31, T. 13 N., R. 13 W.	Northwest-striking quartz veins not traceable beyond workings, but some samples may be on same vein. Veins are from 4 in. to 35 in. wide and locally contain minor pyrite, hematite, and limonite. Country rock is granite that is altered locally.	14 pits, 1 trench, 2 shafts, 1 adit; workings are about 1 mi outside west addition (See fig. 2.)	The highest Au content was 1.03 oz/t and the lowest was 14 ppb. Fourteen of the 22 samples contained significant Au; 13 contained Au in excess of 0.1 oz/t. See table 3 and figure 2.
22-50	Goldbug Mine (Au)	Sec. 29 and 32, T. 13 N., R. 13 W.	Faults and quartz veins strike NE. and NW. in granite. Several prospects are in a breccia zone with no measureable attitude.	11 pits, 2 adits (See fig. 3.)	Three samples contained Au in excess of 0.1 oz/t; the highest was 0.314 oz/t. See table 3 and figure 3.
64-114	State Mine and Greenwood Spring area. (Th)	Sec. 4, 5, and 9, T. 13 N., R. 12 W.	Samples were taken on several quartz veins and faults that strike NW. to NE. in diorite, granite, diabase, gneiss, and schist. Samples taken at the State Mine (108-114), which is patented, contained anomalously high Th.	7 pits, 7 adits, 1 shaft. (See figs. 5-9.)	Highest Th concentration was 0.336% from leached material coating the mine walls. (See fig. 10).
115-116	Unnamed (unknown)	Sec. 11, T. 12 N., R. 10 W.	Pegmatite dike in gneiss and minor copper in gneiss outcrop.	2 trenches	Samples contained 0.3 oz/t and 150 ppb Au, 31 ppm Th, and 1,300 ppm Ba. (See table 3.)

Table 2.--Analytical data for samples not shown on figures 2-10.

[<, less than; Au, gold; Ag, silver; Ba, barium; Th, thorium; U, uranium; Sn, tin; Zn, zinc; Zr, zirconium; in the description column the strike is given first followed by the dip.]

Sample			Assay data			
		Length	Au	Ag	Other	
No.	Type	(in.)	ppb or oz/t	ppm		Description
1	Chip	4	0.688 oz/t	24		Quartz vein, N. 39° W., 45° SW.; granite country rock.
2	do.	4	.483 oz/t	<5		Quartz vein; N. 6° W., 47° NE.; altered granite country rock.
3	do.	28	25 ppb	<5	Ba, 1,300; Zr, 1,400	Medium-grained granite.
4	do.	7	.221 oz/t	<5		Quartz vein; N. 25° W., 4° SW.; granite country rock.
5	do.	9	470 ppb	<5		Quartz vein; N. 33° W., 37° SW.; granite country rock.
6	do.	21	.108 oz/t	7		Quartz vein, N. 33° W., 34° SW.; granite country rock.
7	do.	11	.173 oz/t	5		Quartz vein; N. 41° W., 35° SW.; pyrite cubes; granite country rock.
8	do.	13	.182 oz/t	<5		Quartz vein; N. 5° W., 41° SW.; entire vein not exposed; granite country rock.
9	do.	44	90 ppb	<5	Ba, 1,300	Fracture zone; N. 58° E., 82° SE.; weathered granite country rock.
10	do.	6	.190 oz/t	<5		Quartz vein; N. 17° W., 42° SW.; abundant hematite; granite country rock.
20	do.	25	14 ppb	<5	Ba, 1,400; Zr, 1,000	Fracture; N. 82° W., 84° NE.; biotite granite, biotite altered to chlorite.

Table 2.--Analytical data for samples not shown on figures 2-10--Continued

Sample			Assay data			
			Au	Ag	Other	
No.	Type	Length (in.)	ppb or oz/t	ppm		Description
21	Chip	26	30 ppb	<5		Calcite pod; granite country rock.
22	do.	16	0.314 oz/t	<5		Quartz vein in fault; N. 48° W., 25° SW.; granite country rock.
23	do.	19	230 ppb	<5	Ba, 1,500	Do.
24	do.	4	45 ppb	<5		Quartz vein; about N. 70° E., 43° NW.
25	do.	17	58 ppb	<5	Ba, 1,800	Do.
26	do.	2	78 ppb	<5	Sb, 26.8	Quartz vein; N. 70° E., 23° SE.; limonite; granite country rock.
27	do.	24	74 ppb	6	Sb, 33.3	Fault; N. 70° E., 23° SE.; clay gouge; limonite and hematite staining; granite country rock.
28	do.	36	170 ppb	<5	Ba, 1,300; Zr, 1,200	Fault; N. 88° E., 66° SE.; slickensides, minor clay gouge; granite country rock.
29	do.	38	67 ppb	<5	Ba, 1,100	Fault; N. 88° E., 50° SE.; highly brecciated granite country rock.
30	do.	23	32 ppb	<5		Fault; N. 52° W., 45° SW.; sheared granite, clay gouge; porphyritic granite country rock.
31	do.	13	51 ppb	<5	Ba, 2,100	Fault; N. 88° E., 84° SE.; sheared granite country rock.
32	do.	4	15 ppb	<5	Ba, 1,400; Zr, 1,100	Fault; N. 64° W., 32° SW.; minor clay gouge; granite country rock.

Table 2.--Data for samples not shown on figures 2-10--Continued

Sample			Assay data			
			Au	Ag	Other	
No.	Type	Length (in.)	ppb or oz/t	ppm		Description
33	Chip	18	<5 ppb	<5	Ba, 1,500	Fault; N. 65° W., 45° SW.; highly brecciated granite and clay gouge; granite country rock.
34	do.	21	<5 ppb	<5	Ba, 1,500	Fault; N. 42° W., 76° SW.; clay gouge; very altered granite(?) country rock.
35	do.	4	11 ppb	<5		Quartz vein; N. 15° W., 45° SW.; small vugs, fractured, limonite-stained; granite country rock.
36	do.	38	14 ppb	<5		Fault; N. 50° W., 73° NE.; crushed granite country rock.
37	do.	24	0.125 oz/t	10		Fault; N. 20° E., 34° SE.; two small quartz veins in fault, minor limonite; granite country rock.
46	do.	16	6 ppb	<5	Ba, 1,100	Granite.
47	do.	45	.048 oz/t	<5		Breccia; no distinct structure; vuggy, limonite-stained quartz; gneiss(?) country rock.
48	do.	37	39 ppb	<5	Ba, 1,400; Th, 86	Do.
49	do.	32	19 ppb	<5	Ba, 1,700	Do.
50	do.	15	460 ppb	<5		Do.
51	do.	21	.306 oz/t	<5		Quartz vein; N. 18° W., 86° SW.; gneiss country rock.

Table 2.--Analytical data for samples not shown on figures 2-10--Continued

Sample			Assay data			
			Au	Ag	Other	
No.	Type	Length (in.)	ppb or oz/t	ppm		Description
52	Grab	Random	823 ppb	<5		Quartz vein material from dump; calcite, manganese, minor limonite; gneiss country rock.
56	Chip	36	290 ppb	<5		Quartz vein; N. 25° W., 61° SW.; granite country rock.
57	do.	32	0.155 oz/t	13		Quartz vein; unable to measure strike and dip; minor copper staining; vein along gabbro(?).
58	do.	27	.155 oz/t	12		Quartz vein in fault; unable to measure strike and dip; fault gouge, deformed and faulted, no distinct boundaries of vein; granite country rock.
61	do.	17	.133 oz/t	<5		Quartz vein; N. 20° W., 44° SW.; minor pyrite; granite country rock.
62	do.	32	.152 oz/t	<5	Ba, 1,300; Th, 30	Quartz vein; N. 5° E., 73° NW.; alternating layers of quartz and clay gouge; granite country rock.
63	do.	20	.052 oz/t	5		Quartz pod adjacent to fault; N., 57° W.; granite country rock.
64	do.	15	.840 oz/t	<5	Zr, 1,000; Zn, 3,300	Quartz vein and fault; N. 32° E., 34° SE.; fault gouge and 7-in.-wide quartz vein; diorite country rock.
65	do.	22	300 ppb	7	Ba, 1,000	Shear zone; N. 34° E., 35° SE.; sheared granite country rock.
75	Grab	Random	95 ppb	<5		Dump material; quartz; gneiss country rock.

Table 2.--Analytical data for samples not shown on figures 2-10--Continued

Sample			Assay data			
		Length	Au	Ag	Other	
No.	Type	(in.)	ppb or oz/t	ppm		Description
76	Chip	24	59 ppb	<5		Fault; N., 43° W.; pyrite, calcite, minor quartz; diabase country rock.
77	do.	10	170 ppb	7		Fault; unable to measure strike and dip; calcite and limonite; diabase country rock.
101	do.	12	40 ppb	7	Ba, 1,300	Fault; N. 4° E., 67° SE.; clay, brecciated quartz; diorite country rock.
102	do.	70	6 ppb	<5	Th, 82.5	Fault zone; N. 12° W., 76° NE.; abundant iron-oxide staining, minor quartz; gneiss country rock.
103	do.	80	17 ppb	<5	Ba, 1,300; Th, 99	Do.
104	do.	12	<5 ppb	<5	Th, 34	Quartz vein in fault (samples 102 and 103); N. 12° W., 76° NE.; inclusions of gneiss; gneiss country rock.
105	do.	14	17 ppb	<5	Ba, 1,200	Pegmatite lens; minor quartz; schist country rock.
106	do.	16	0.122 oz/t	<5		Fault; N. 27° E., vertical; abundant gouge, clay, feldspar altered to clay; granite country rock.
107	do.	34	410 ppb	<5	Th, 159; U, 15	Fracture zone; N. 36° W., 83° SW.; granite country rock.
115	do.	24	150 ppb	<5	Ba, 1,300; Th, 31	Gneiss; minor copper stain.
116	do.	24	.3 oz/t	<5		Pegmatite dike; N. 40° W., 55° NE.; minor tourmaline; gneiss country rock.

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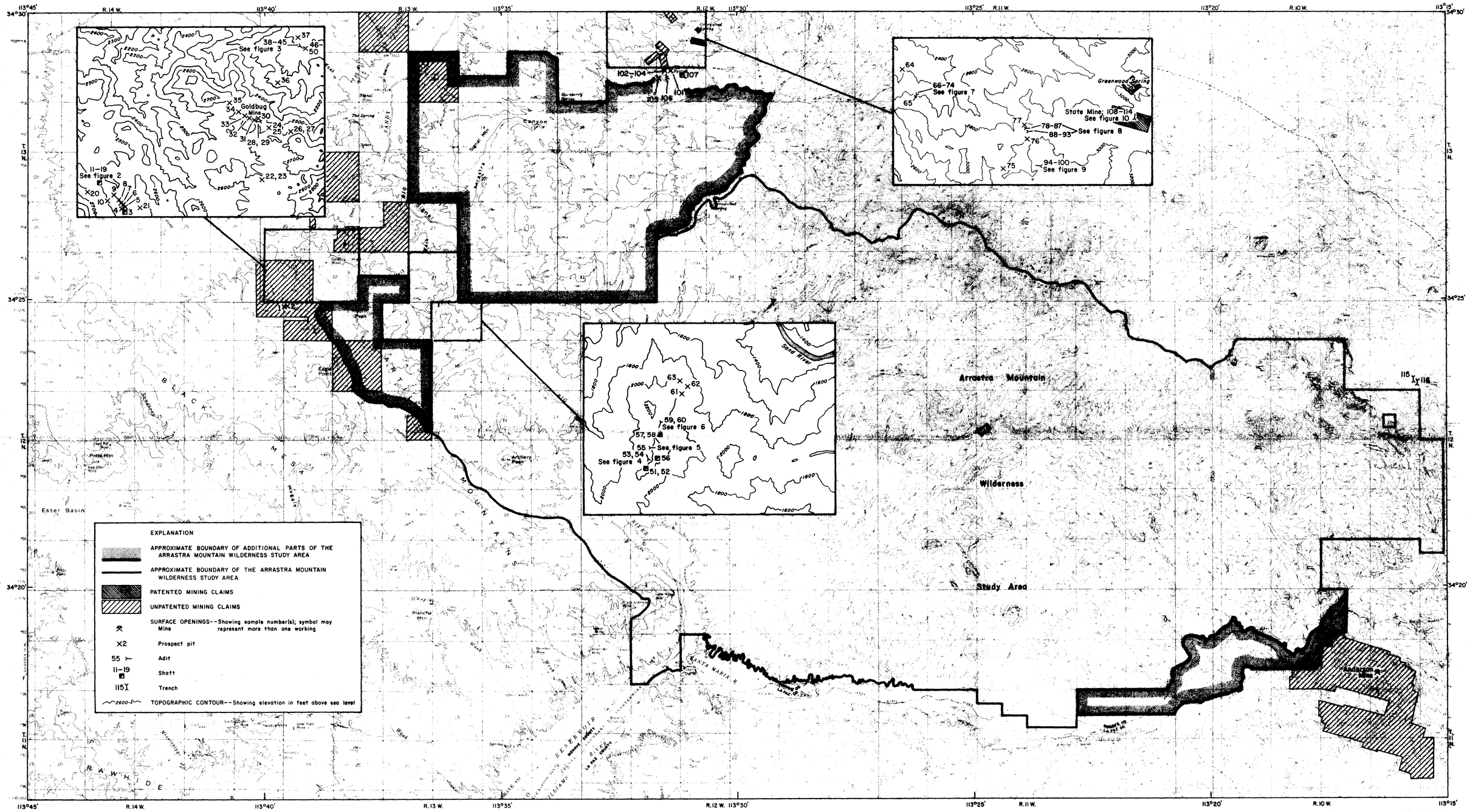
OPEN FILE REPORT
MLA 25-88
PLATE 1



Base from the U.S. Geological Survey, 1:24,000
Arrastra Mtn, 1967; Arrastra Mtn NE, 1967;
Arrastra Mtn SE, 1967; and Palmerita Ranch, 1967.
Artillery Peak, 1966, 1:62,500

MN

SCALE 1:62,500
0 ½ 1 2 3 4 5mi
CONTOUR INTERVALS 40 AND 80ft

ARIZONA
MAP LOCATION

Field work completed in 1987 by Michael E. Lane; assisted by Stanley L. Korzeb and David C. Scott.

MINE AND PROSPECT MAP OF ADDITIONAL PARTS OF THE ARRASTRA MOUNTAIN WILDERNESS STUDY AREA, LA PAZ, MOHAVE, AND YAVAPAI COUNTIES, ARIZONA

BY

MICHAEL E. LANE, U.S. BUREAU OF MINES

1988