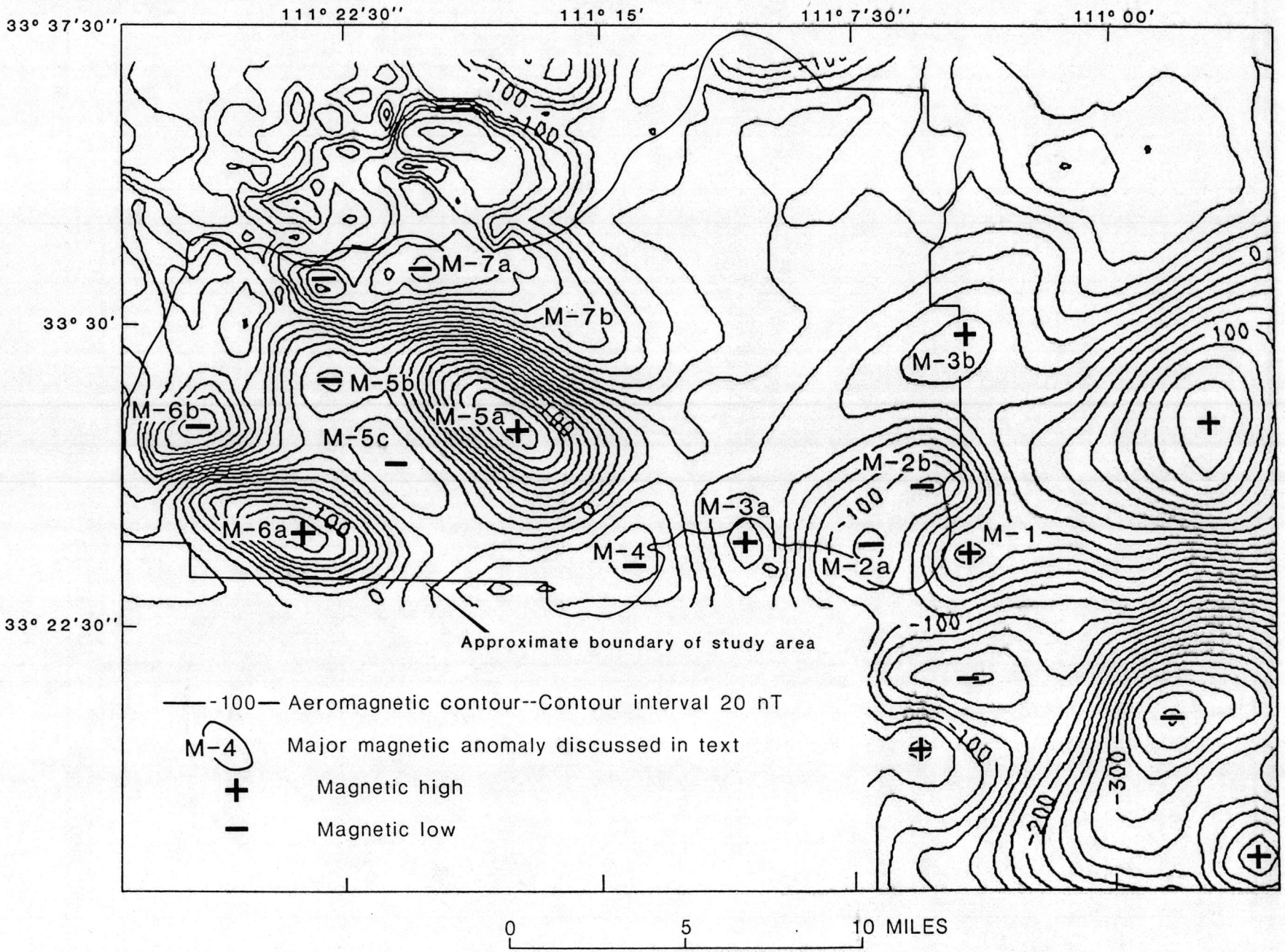


Figure P1.--Parallel-surface aeromagnetic map of the Superstition Wilderness and vicinity.

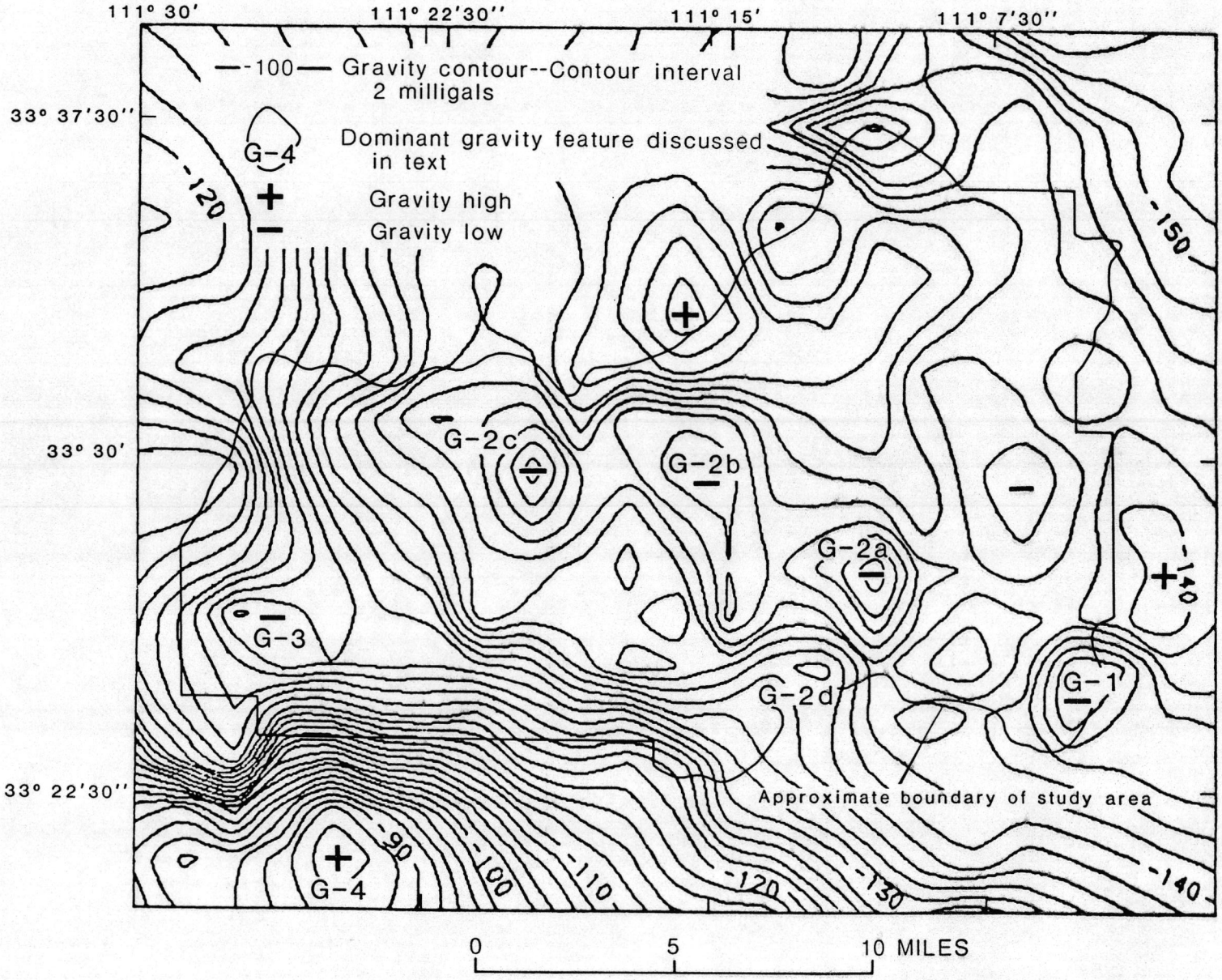


Figure P2.--Gravity map of the Superstition Wilderness and vicinity.

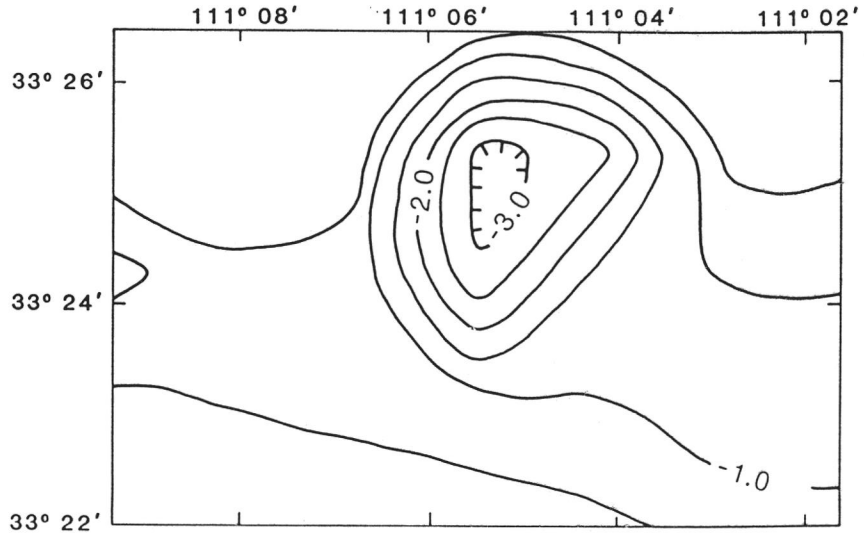


Figure P3.--Gravity model of the Haunted Canyon cauldron (anomaly G-1, fig. P2). Lines indicate depth contours at 0.5 km interval, hachures indicate gravity low.

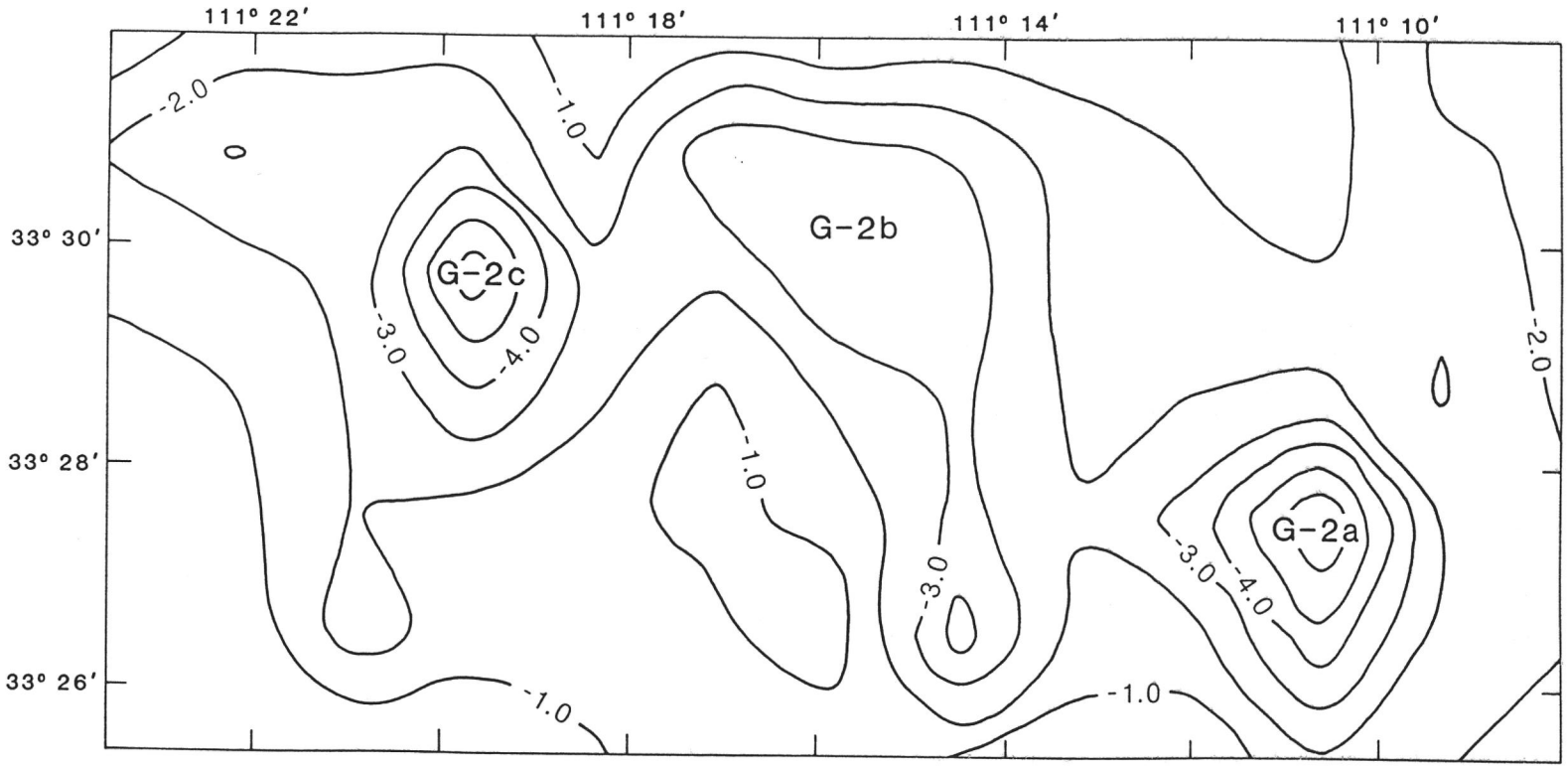


Figure P4.--Gravity model in vicinity of La Barge Canyon cauldron (anomalies G-2a, G-2b, and G-2c from fig. P2). Lines indicate 1 km depth contours below surface.

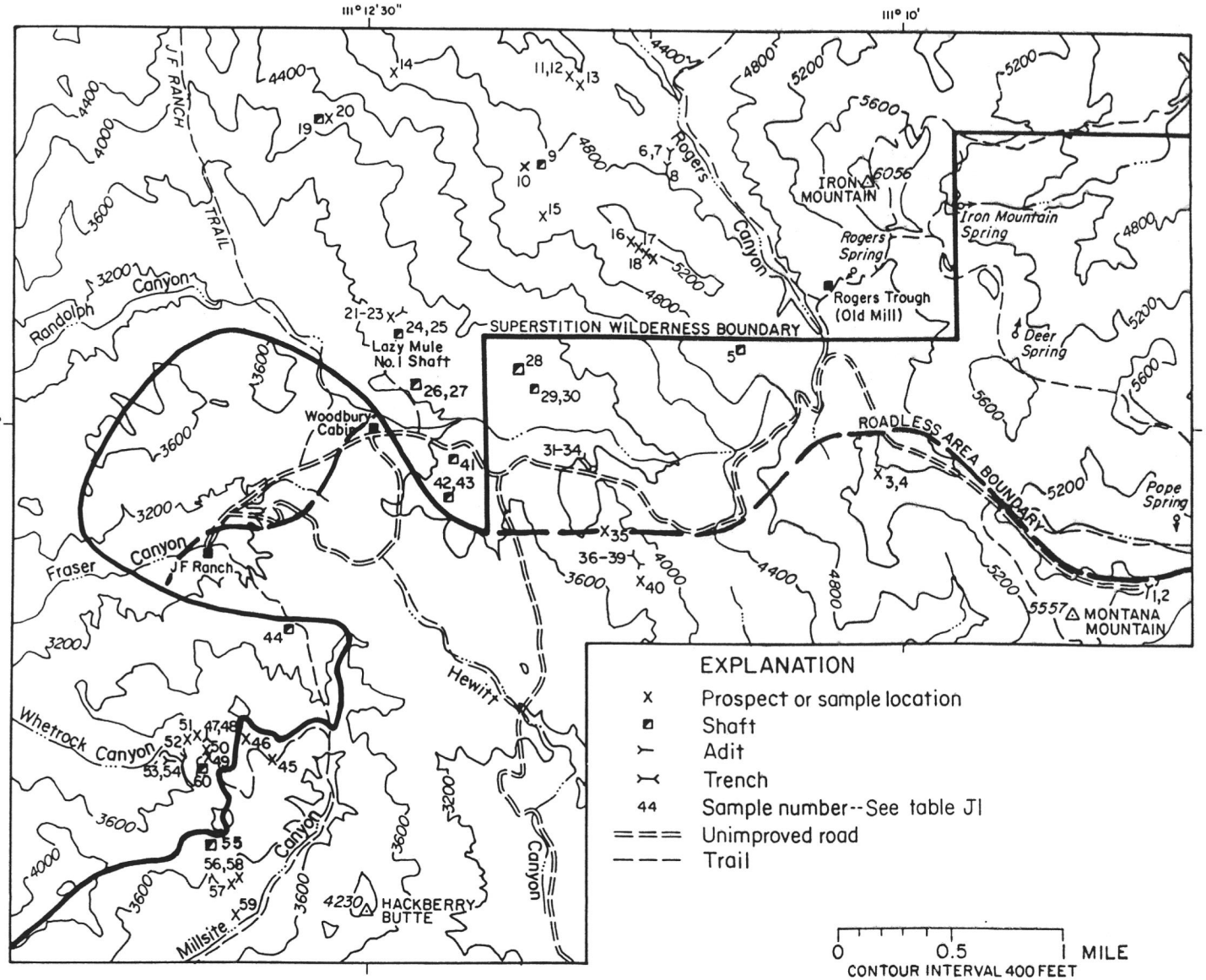


Figure J1.--Prospects and samples in the JF area, Superstition Wilderness vicinity.

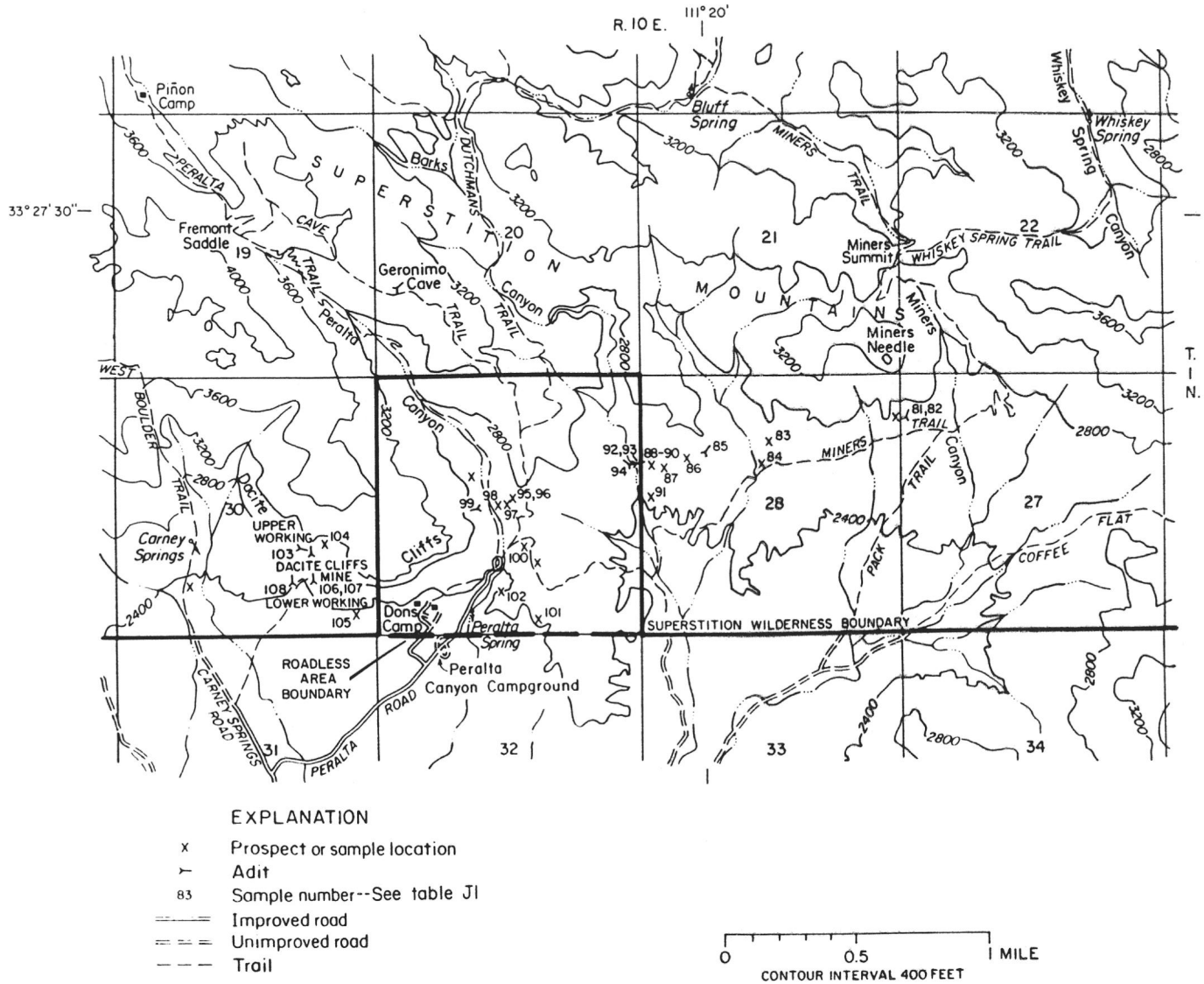
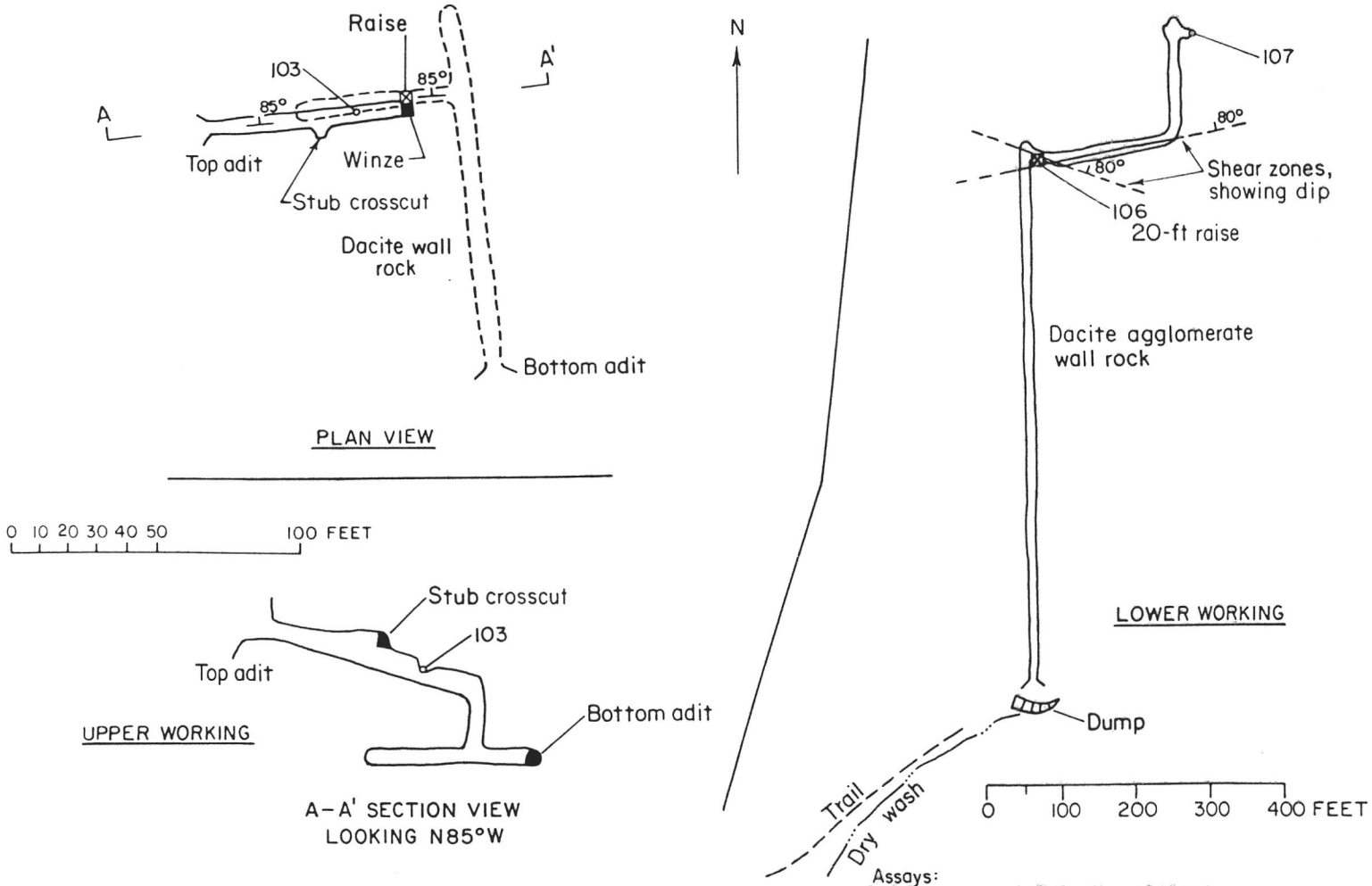


Figure J2.--Prospects and samples in the Peralta area, Superstition Wilderness vicinity.



Assays:

Sample No.	Ounces/ton		Percent		Width
	Gold	Silver	Copper	Lead	
103	0.01	0.9	1.3	1.5	2.5-ft chip

Assays:

Sample No.	Ounces/ton		Width
	Gold	Silver	
106	0.01	0.1	0.5-ft chip
107	Trace	0.1	4.5-ft chip

Figure J3.--Dacite Cliffs mine workings and sample localities. See figure J2 for location.

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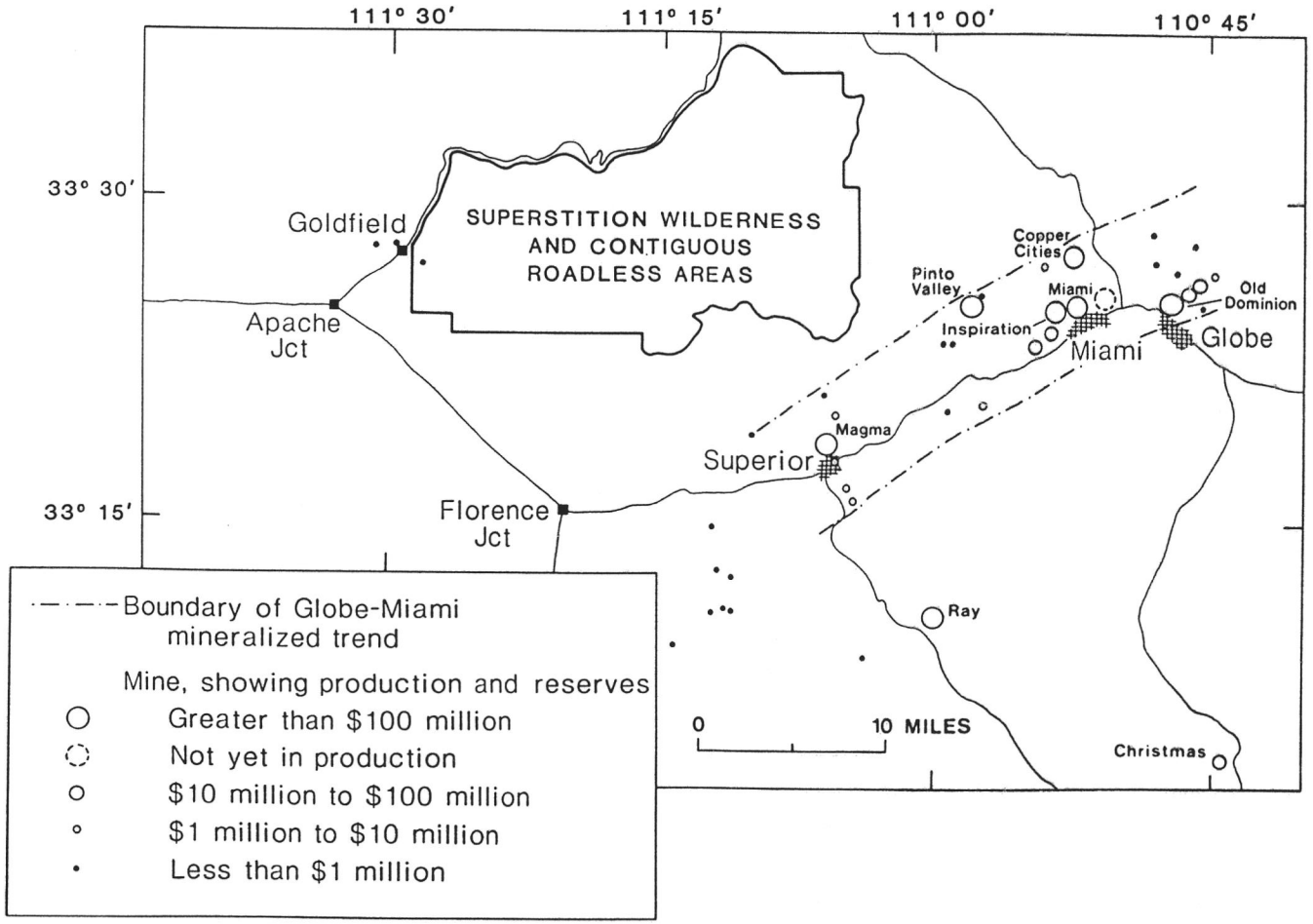


Figure M1.--Relation of Superstition Wilderness to east-northeast-trending mineral belt through Superior and the Globe-Miami district (adapted from Peterson, 1962, fig. 14) and other nearby mining districts.

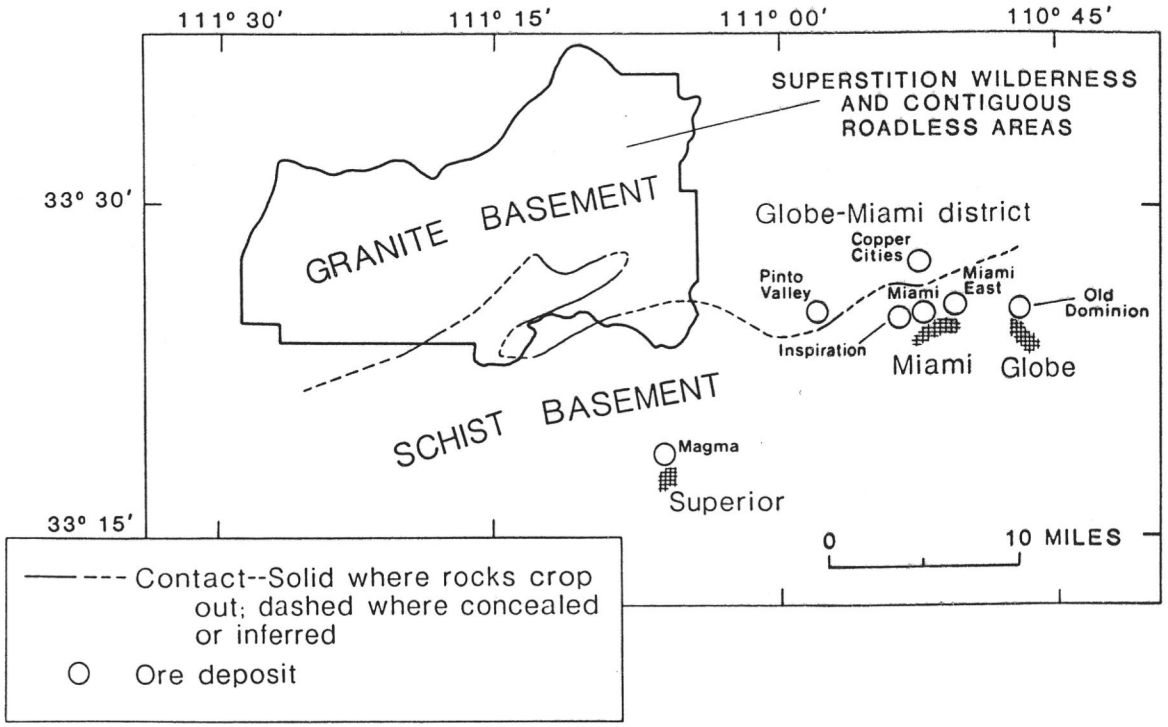


Figure M2.--Generalized contact between the Pinal Schist and Ruin Granite in the Superstition Wilderness and vicinity.

Table C1.--Summary of chemical analyses of 1,231 rock samples, Superstition Wilderness study area, Arizona
[In parts per million except as noted; N, not detected; --, not calculated]

Element	Minimum	Maximum	Geometric mean	Geometric deviation
Fe (percent) ----	N (.05)	>20	2.02	2.89
Mg (percent) ----	<0.02	10	.39	3.68
Ca (percent) ----	N (.05)	20	.51	4.60
Ti (percent -----	N (.002)	>1	.19	2.70
Mn ----------	20	>5,000	526	2.88
Ag ----------	N (.5)	>5,000	.28	2.62
B ----------	N (10)	>2,000	12.5	2.07
Ba ----------	N (20)	>5,000	591	2.88
Be ----------	N (1)	70	1.60	1.90
Co ----------	N (5)	100	6.23	2.72
Cr ----------	N (10)	2,000	13.7	3.08
Cu ----------	N (5)	>20,000	9.15	4.76
La ----------	N (20)	700	35.1	2.06
Mo ----------	N (5)	500	2.31	1.68
Nb ----------	N (20)	70	15.4	1.43
Ni ----------	N (5)	2,000	7.96	3.52
Pb ----------	N (10)	>20,000	22.7	3.48
Sc ----------	N (5)	70	6.56	1.99
Sr ----------	N (100)	>5,000	176	2.63
V ----------	N (10)	700	43.5	3.05
Y ----------	N (10)	200	21.9	1.69
Zn ----------	N (200)	>10,000	119	1.86
Zr ----------	N (10)	1,000	121	2.27
Hg ----------	N (.02)	1.8	--	--
F ----------	10	227,000	--	--

Table C2.--Correlation matrix and number of valid pairs for 1,231 rock samples, Superstition Wilderness Area
[Below the diagonal are the numbers of valid pairs for the correlation analysis]

	Fe	Mg	Ca	Ti	Mn	Ag	B	Ba	Be	Co	Cr	Cu	La	Mo	Nb	Ni	Pb	Sc	Sr	V	Y	Zn	Zr	Hg	F
Fe ---	1.00	0.73	0.51	0.74	0.42	0.01	-0.01	0.35	-0.22	0.81	0.59	0.50	0.30	0.19	0.01	0.73	0.08	0.75	0.42	0.81	0.33	0.23	0.38	0.06	0.26
Mg ---	1,222	1.00	.70	.59	.53	-.08	-.01	.29	-.20	.76	.59	.35	.26	-.10	-.05	-.76	-.03	.68	.45	.70	.25	.25	.29	-.01	.26
Ca ---	1,158	1,159	1.00	40	.55	-.06	-.20	.20	-.08	.56	.37	.28	.29	-.14	-.08	.53	-.05	.49	.55	.54	.21	.02	.11	-.08	.28
Ti ---	1,199	1,196	1,135	1.00	.36	-.13	-.02	.52	-.32	.60	.47	.23	.33	-.09	-.07	.56	-.06	.69	.44	.75	.34	-.05	.60	-.02	.21
Mn ---	1,213	1,211	1,146	1,189	1.00	-.02	-.16	.31	.08	.40	.30	.26	.21	.09	-.08	.35	.16	.27	.13	.35	.24	.28	.15	.03	.34
Ag ---	159	161	149	158	157	1.00	.19	-.23	.07	-.08	-.13	.62	-.19	.45	-.14	-.05	.55	-.06	-.06	-.13	-.04	.16	-.18	.56	.32
B ----	806	805	776	798	797	100	1.00	-.12	.09	-.02	.00	.11	-.09	.02	-.02	.00	.07	.07	-.18	-.03	.02	.07	.02	.17	.01
Ba ---	1,210	1,208	1,145	1,186	1,204	157	798	1.00	-.27	-.08	.01	-.09	.42	.02	-.11	-.02	-.13	-.05	.30	.25	.11	-.08	.49	.00	.21
Be ---	1,016	1,014	973	1,009	1,003	143	701	1,006	1.00	-.26	-.14	.00	.00	.18	.11	-.27	.17	-.20	-.15	-.29	.13	.09	-.27	.10	.17
Co ---	764	766	745	743	759	114	519	759	618	1.00	.68	.55	.16	.05	.04	.87	.10	.82	.39	.82	.18	.14	-.05	-.05	.15
Cr ---	516	515	488	496	513	78	338	507	359	446	1.00	.32	.08	-.04	.05	.81	.05	.66	.25	.61	.06	.11	.02	-.08	.12
Cu ---	769	768	743	749	756	141	519	758	616	620	924	1.00	.02	.44	-.03	.54	.52	.49	.29	.41	.11	.47	-.10	.20	.45
La ---	998	996	967	986	989	121	676	992	876	668	405	654	1.00	.09	.12	.12	-.07	.15	.35	.29	.35	-.08	.32	-.02	.22
Mo ---	103	103	97	103	97	33	73	99	80	58	49	82	87	1.00	.03	-.06	.40	-.07	.08	.07	.10	.14	-.11	-.15	.00
Nb ---	351	352	343	345	349	48	231	353	309	210	125	211	331	49	1.00	-.03	.02	.08	-.01	-.02	-.01	-.18	.04	-.11	-.03
Ni ---	723	725	696	700	714	115	474	717	561	630	460	585	603	64	193	1.00	.06	.78	.41	.76	.13	.17	.02	-.05	.19
Pb ---	1,021	1,018	985	1,007	1,008	145	695	1,009	918	649	387	664	911	93	339	590	1.00	.08	-.21	-.01	.09	.42	-.11	.26	.18
Sc ---	947	946	920	924	937	131	645	939	786	722	475	691	836	85	293	655	820	1.00	.35	.79	.32	.13	.08	-.04	.09
Sr ---	890	890	879	869	880	99	585	880	742	652	393	633	810	70	272	583	794	769	1.00	.52	.04	-.30	.24	-.06	.23
V ----	1,140	1,139	1,095	1,118	1,131	153	759	1,129	939	763	513	754	950	99	322	717	959	920	861	1.00	.32	.08	.31	-.03	.23
Y ----	1,166	1,164	1,116	1,144	1,154	154	777	1,156	992	751	498	743	988	100	347	701	1,000	935	870	1,098	1.00	.07	.30	.01	.20
Zn ---	103	103	97	101	95	57	61	100	87	82	63	95	80	22	16	81	95	95	64	400	100	1.00	-.20	.14	.57
Zr ---	1,197	1,194	1,143	1,175	1,185	157	798	1,185	1,006	758	509	762	99	103	351	713	1,015	944	884	1,126	1,161	102	1.00	.04	.04
Hg ---	487	489	471	481	481	75	311	484	429	320	209	315	414	53	183	297	413	392	358	463	470	35	484	1.00	.14
F ----	444	446	416	425	438	69	261	437	347	287	216	268	335	63	228	272	364	353	290	418	419	39	430	231	1.00

Table C3.--Varimax-rotated factor-loading matrix for 1,231 rock samples, Superstition Wilderness area [Underlined loadings were used as weighting coefficient in the weighted sum equations]

Element	1	2	3	4	5	6	7
Fe ---	0.799	0.198	0.394	-0.146	0.026	-0.061	0.023
Mg ---	.775	-.112	.224	-.326	.067	-.160	.013
Ca ---	.535	-.155	.084	.390	.027	-.530	-.033
Ti ---	.652	-.050	.632	-.014	.116	-.062	.041
Mn ---	.322	.038	.207	-.659	.012	-.120	-.142
Ag ---	-.093	.647	-.179	-.089	.110	-.082	.652
B ----	.073	.013	.030	.167	-.136	.459	.463
Ba ---	-.032	-.053	.766	-.178	.292	-.227	-.117
Be ---	-.296	.079	-.227	-.348	-.636	.015	.067
Co ---	.945	..94	-.056	-.078	-.017	-.103	-.050
Cr ---	.803	-.039	-.073	-.054	-.009	.025	-.089
Cu ---	.497	.660	-.127	-.254	.026	-.106	-.310
La ---	.093	.018	.573	-.155	-.356	-.308	-.085
Mo ---	-.057	.911	.061	.039	-.074	-.057	-.213
Nb ---	.054	-.015	-.025	.237	-.647	-.019	-.064
Ni ---	.934	.009	-.070	-.102	.067	-.092	.005
Pb ---	.042	.667	-.097	-.251	-.042	.250	.215
Sc ---	.920	.022	.066	.008	-.121	.036	.050
Sr ---	.384	.036	.230	.086	-.016	-.792	.050
V ----	.842	.064	.322	-.046	.013	-.142	-.029
Y ----	.197	.084	.489	-.242	-.436	.120	-.017
Zn ---	.144	.254	-.157	-.716	.164	.417	.044
Zr ---	.092	-.122	.839	.111	.052	.019	.097
Hg ---	-.069	.015	.033	-.132	.063	.017	.856
F ----	.104	.133	.119	-.719	-.057	-.162	.265

Table C4.--Summary of chemical analyses of 1,038 minus-80-mesh stream-sediment samples, Superstition Wilderness area, Arizona
[In parts per million except as noted; N, not determined]

Element	Minimum	Maximum	Geometric mean	Geometric deviation
Fe (percent) ----	0.7	>20	6.30	1.82
Mg (percent) ----	0.15	7	1.02	1.68
Ca (percent) ----	0.07	10	1.00	2.04
Ti (percent) ----	0.03	>1	0.68	1.83
Mn ----------	200	>5,000	1,162	1.51
Ag ----------	N (0.5)	10	0.26	1.29
B ----------	N (10)	50	20.3	1.81
Ba ----------	50	>5,000	585	1.71
Be ----------	N (1)	30	1.28	1.66
Co ----------	N (5)	150	18.3	1.82
Cr ----------	<10	3,000	69.4	2.71
Cu ----------	<5	700	29.8	1.78
La ----------	N (20)	1,000	52.1	1.83
Mo ----------	N (5)	30	2.72	1.37
Nb ----------	N (20)	200	21.9	1.63
Ni ----------	N (5)	300	27.5	2.36
Pb ----------	N (10)	15,000	33.3	1.83
Sc ----------	<5	30	13.3	1.52
Sr ----------	N (100)	1,000	169	1.90
V ----------	N (20)	2,000	163	1.95
Y ----------	N (10)	1,000	50.1	1.84
Zn ----------	N (200)	1,500	114	1.42
Zr ----------	10	>1,000	379	2.00

Table C5.--Correlation matrix of the 1,038 stream-sediment samples, Superstition Wilderness area
[Below the diagonal are the numbers of valid pairs of the correlation analysis]

	Fe (percent)	Mg (percent)	Ca (percent)	Ti (percent)	Mn	Ag	B	Ba	Be	Co	Cr	Cu	La	Mo	Nb	Ni	Pb	Sc	Sr	V	Y	Zn	Zr
Fe (percent) ---	1.00	0.49	.34	.55	0.60	0.01	-0.13	-0.17	-0.22	0.73	0.63	0.21	0.10	-0.22	0.19	0.50	0.06	0.61	-0.06	0.81	0.42	0.23	0.27
Mg (percent) ---	1,031	1.00	.69	.46	.28	.01	.05	.03	-.14	.63	.53	.44	-.20	.03	.00	.70	.07	.59	.12	.41	.03	-.04	-.06
Ca (percent) ---	1,031	1,038	1.00	.36	.34	.04	-.15	.19	-.27	.47	.38	.30	-.10	.06	.04	.55	.03	.44	.34	.28	-.08	.00	-.05
Ti (percent) ---	755	758	758	1.00	.46	-.16	.10	.16	-.09	.53	.50	.32	.05	-.01	.14	.46	.06	.58	.05	.58	.20	-.07	.25
Mn ----------	1,031	1,038	1,038	758	1.00	-.23	-.20	.07	-.07	.51	.48	.24	.10	-.03	.12	.36	.09	.47	-.03	.55	.19	.54	.16
Ag ----------	41	41	41	38	41	1.00	.55	-.25	-.18	.07	.01	-.14	.05	-.02	-.32	.12	-.06	.05	-.01	-.12	-.05	.09	-.18
B ----------	972	973	973	724	973	39	1.00	.12	.17	-.06	-.02	.23	-.12	-.09	-.05	.05	-.06	.02	-.13	-.19	-.07	-.08	-.07
Ba ----------	1,029	1,036	1,036	756	1,036	40	971	1.00	-.18	-.15	-.08	.15	.11	-.04	.01	.08	-.10	-.05	.52	-.29	-.34	-.15	.03
Be ----------	814	816	816	691	816	37	795	814	1.00	-.28	-.19	.01	.12	.05	-.04	-.27	.22	-.15	-.25	-.20	.22	.15	.05
Co ----------	1,028	1,033	1,033	755	1,033	41	973	1,031	813	1.00	.74	.40	-.14	-.16	-.2	.74	-.06	.76	-.03	.74	.16	.23	-.06
Cr ----------	1,028	1,035	1,035	755	1,035	41	972	1,033	813	1,032	1.00	.46	-.14	-.03	-.23	.73	-.08	.74	.06	.75	.10	-.03	-.04
Cu ----------	1,029	1,036	1,036	756	1,036	41	972	1,034	814	1,032	1,035	1.00	-.17	.07	-.18	.56	.09	.48	.02	.24	-.18	.01	-.19
La ----------	983	990	990	748	990	40	930	988	802	985	987	988	1.00	.17	.29	-.24	.24	-.04	.20	.01	.37	.42	.38
Mo ----------	77	78	78	70	78	6	73	78	71	78	78	78	78	1.00	-.12	-.07	.05	-.05	-.01	-.20	-.17	.49	-.11
Nb ----------	676	679	679	549	679	20	638	678	580	677	679	679	677	64	1.00	-.16	.12	-.09	.06	-.03	.26	.34	.21
Ni ----------	1,012	1,016	1,016	737	1,016	41	962	1,014	801	1,014	1,016	1,016	968	78	667	1.00	-.11	.69	.13	.05	-.16	-.03	-.16
Pb ----------	1,018	1,025	1,025	753	1,025	41	963	1,023	814	1,020	1,022	1,023	981	77	678	1,003	1.00	.04	-.18	.03	.39	.28	.31
Sc ----------	1,026	1,033	1,033	753	1,033	41	972	1,031	814	1,029	1,031	1,032	985	78	678	1,016	1,020	1.00	-.06	.64	.18	-.05	.01
Sr ----------	876	877	877	677	877	41	847	875	727	876	875	875	839	73	559	874	868	876	1.00	-.12	-.26	-.04	-.08
V ----------	1,031	1,038	1,038	758	1038	41	973	1,036	816	1,033	1,035	1,036	990	78	679	1,015	1,025	1,033	877	1.00	.42	.11	.20
Y ----------	1,030	1,037	1,037	758	1,037	41	973	1,035	816	1,032	1,034	1,035	990	78	679	1,015	1,025	1,032	876	1,037	1.00	.29	.52
Zn ----------	99	100	100	71	100	11	88	100	78	100	100	100	99	17	65	100	98	100	95	100	100	1.00	.01
Zr ----------	958	959	959	715	959	40	924	957	768	956	956	957	911	73	615	954	947	958	852	959	958	91	1.00

Table C6.--Varimax-rotated factor loading matrix for 1,038 stream-sediment samples, Superstition Wilderness area [Underlined loadings were used as weighting coefficients in the weighted sum equations]

Element	1	2	3	4	5	6	7	8
Fe ---	0.819	-0.270	-0.151	0.005	-0.170	-0.202	0.026	-0.195
Mg ---	.582	.083	.040	-.024	.109	.029	.690	-.053
Ca ---	.422	.063	.272	.073	-.054	-.194	.694	-.062
Ti ---	.679	-.181	.196	-.147	-.045	.213	.141	-.164
Mn ---	.689	-.122	.106	.388	-.223	.040	-.157	-.187
Ag ---	-.036	.006	-.153	.095	.878	-.327	.098	.252
B ----	-.011	.115	.061	-.163	.835	.405	-.076	-.101
Ba ---	-.053	.053	.893	-.107	-.056	.129	.010	-.055
Be ---	-.210	-.198	-.202	.106	.002	.671	-.130	.033
Co ---	.882	.094	-.132	.060	.062	-.152	.165	-.099
Cr ---	.870	.072	-.008	-.016	-.020	-.024	.062	.264
Cu ---	.508	.263	.219	.069	.064	.526	.193	.119
La ---	-.048	-.704	.301	.229	.127	-.140	-.259	-.111
Mo ---	-.163	.120	-.028	.721	-.130	.152	.229	.197
Nb ---	-.049	-.197	.022	.069	-.101	-.051	.054	-.934
Ni ---	.760	.269	.138	-.024	-.134	-.019	.330	.104
Pb ---	-.079	-.600	-.147	.205	-.049	.346	.368	.047
Sc ---	.831	-.030	-.020	-.053	.063	.081	.217	.119
Sr ---	-.029	-.001	.760	.040	-.020	-.357	.168	.029
V ----	.856	-.205	-.243	-.070	-.168	-.144	-.056	-.033
Y ----	.200	-.746	-.394	-.004	-.014	.027	-.039	-.160
Zn ---	.123	-.241	-.073	.919	.082	-.014	-.131	-.270
Zr ---	.056	-.766	.035	-.132	-.139	.057	-.038	-.085

Table C7.--Selected chemical analyses of waters collected from springs and small streams within the Two Bar Mountain quadrangle, Arizona
[--, not determined]

Sample number	Conductivity (mhos/cm)	pH	Radon (pCi/L)	U (μg/L)
100	670	7.05	2,050	--
105	520	7.40	386	--
106	490	7.60	184	--
109	410	8.15	45	--
201	730	7.30	700	--
203	1,340	7.25	39	--
204	530	6.85	4,710	34
205	540	7.10	10,450	64

Table J1.--Descriptions and results of analyses of samples from the Superstition Wilderness and contiguous roadless areas, Gila, Maricopa, and Pinal Counties, Arizona

[Gold and silver determined by fire assay; values reported in oz/ton. Copper, lead, zinc, and tungsten determined by chemical analysis; values reported in percent. Sample locations shown on plate 3. Spectrographic analyses results are available for public inspection at the U.S. Bureau of Mines, Intermountain Field Operations Center, Building 20, Denver Federal Center, Denver, Colorado. Tr, trace; -, not detected; ND, not determined]

Sample No.	Sample Type	Gold	Silver	Copper	Lead	Zinc	Descriptions
1	Specimen	-	0.1	0.68	ND	ND	Schist with malachite and azurite. Prospect dump.
2	Specimen	Tr	-	1.89	ND	ND	Do.
3	Chip	-	-	ND	ND	ND	Dacite with quartz stringers; minor limonite, otherwise no mineralization visible. Prospect wall.
4	1.5-ft chip	Tr	-	ND	ND	ND	Granite gouge at shear zone; no mineralization visible. Prospect wall.
5	2.0-ft chip	-	-	ND	ND	ND	Limonite fault gouge; no mineralization visible. Shaft wall.
6	9-in chip	-	Tr	ND	ND	ND	Quartzose shear zone in diorite. Adit face.
7	Grab	Tr	.9	.06	.05	ND	Diorite and quartz with minor malachite. Adit dump.
8	Specimen	Tr	11.3	ND	ND	ND	Altered granite showing secondary copper mineralization. Caved adit dump.
9	Grab	-	.2	ND	ND	ND	Drusy quartz with chlorite. Shaft dump.
10	Grab	.02	8.1	.02	.19	.03	Quartz. From dump north of prospect pit.
11	3-in chip	Tr	1.2	.05	ND	ND	Quartz vein with secondary copper in diorite country rock. Prospect wall.
12	Specimen	.03	27.3	1.5	.09	ND	Quartz with malachite and chrysocolla. Prospect dump.
13	Specimen	.02	48.0	ND	ND	ND	Quartz with malachite and azurite. Prospect stockpile.
14	Specimen	Tr	-	ND	ND	ND	Quartz zone in schist and diabase. Outcrop.
15	Grab	-	.1	ND	ND	ND	Quartzose shear zone in diorite. Prospect dump.
16	Grab	Tr	10.6	1.2	ND	ND	Quartz with malachite, azurite, and chrysocolla. Prospect dump.
17	1.2-ft chip	-	-	ND	ND	ND	Quartz vein in quartz diorite; no mineralization visible. Prospect wall.
18	Grab	.01	14.1	.28	2.0	0.30	Altered granite with malachite, azurite and chrysocolla. Prospect dump
19	1.2-ft chip	Tr	.1	ND	ND	ND	Altered diabase with intruded aplitic dikes 1 to 2 inch wide; no mineralization visible. Shaft collar.
20	Chip	Tr	.2	ND	1.3	2.20	Quartz with hematite stain. Near prospect.
21	1.3-ft chip	Tr	.2	.36	2.2	1.50	Diorite(?). Shear zone near prospect.
22	0.9-ft chip	Tr	Tr	.10	1.3	.90	Diabase, footwall of shear. Prospect wall.
23	Specimen	.02	2.4	.38	11.2	5.8	Copper mineralization at prospect.
24	Specimen	.01	.3	.18	1.3	2.7	Diabase; among last material removed from shaft. Visible malachite, azurite, chrysocolla, galena. Shaft dump.
25	Specimen	.03	1.6	.34	15.3	21.3	Diabase; shows galena, sphalerite. Shaft wall.
26	1.3-ft chip	Tr	.5	.66	ND	ND	Siliceous dike in granite; pyrite, malachite, chrysocolla, brochantite(?). Shaft wall.
27	3.0-ft chip	Tr	.1	ND	ND	ND	Decomposed granite; immediately west of sample 26. Shaft wall.
28	Grab	Tr	-	ND	ND	ND	Altered coarse-grained granite; minor iron oxides. Shaft dump.
29	Specimen	Tr	.6	1.2	.12	ND	Shear zone, with malachite and chrysocolla, in altered diabse. Shaft dump.
30	6.3-ft chip	Tr	.1	ND	ND	ND	Granite; shear zone with malachite and chrysocolla. Shaft wall.

Table J1.--Descriptions and results of analyses of samples from the Superstition Wilderness and contiguous roadless areas, Gila, Maricopa, and Pinal Counties, Arizona-Continued

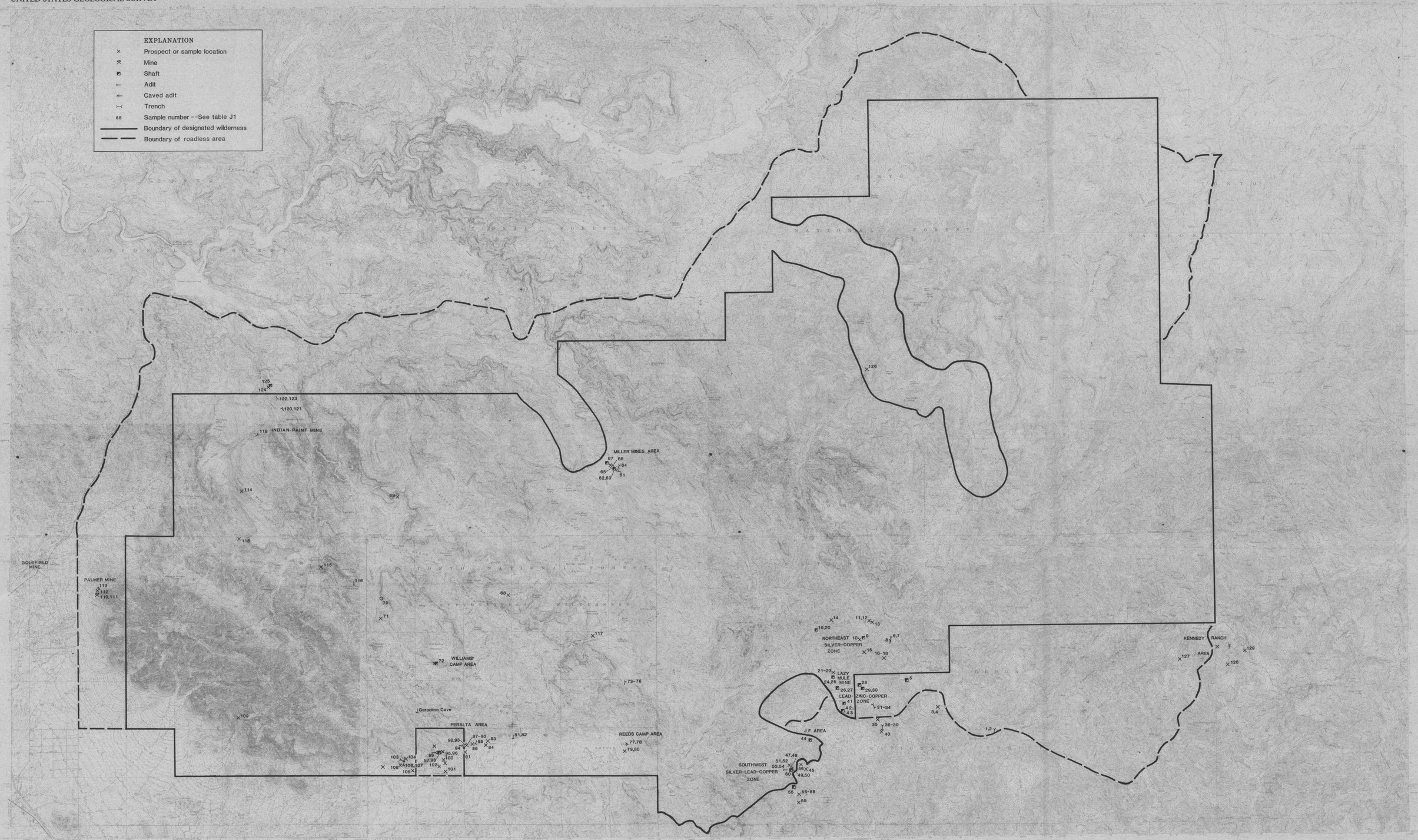
Sample No.	Sample Type	Gold	Silver	Copper	Lead	Zinc	Descriptions
31	3.8-ft chip	Tr	Tr	ND	ND	ND	Granite with malachite, chrysocolla, and chalcopyrite. Trench.
32	Grab	-	-	ND	ND	ND	Quartz monzonite. Trench.
33	3.7-ft chip	-	-	ND	ND	ND	Do.
34	4.6-ft chip	-	-	ND	ND	ND	Chloritized granite. Trench.
35	Chip	-	-	.22	.70	.44	Granite with hematite and chlorite. Trench.
36	3.6-ft chip	Tr	-	ND	ND	ND	Decomposed granite; hematite stained. Trench.
37	1.9-ft chip	-	-	ND	ND	ND	Decomposed granite; chlorite alteration. Trench.
38	2.8-ft chip	Tr	-	ND	ND	ND	Altered granite with iron oxides. Trench.
39	Chip	-	-	ND	ND	ND	Decomposed granite; hematite stain. Trench.
40	12.0-ft chip	-	-	ND	ND	ND	Granite with hematite stain. Prospect.
41	Grab	.03	Tr	.20	1.1	.28	Shear zone in diabase. Shaft dump.
42	Grab	-	-	ND	ND	ND	Diabase; minor pyrite on dump. Shaft dump.
43	Specimen	-	.1	ND	ND	ND	Do.
44	Grab	Tr	-	ND	ND	ND	Diabase; no mineralization visible. Shaft dump.
45	2.5-ft chip	-	.1	ND	ND	ND	Siliceous glauconitic material; no mineralization visible. Prospect wall.
46	Specimen	Tr	-	ND	ND	ND	Contact between granodiorite and latite. Prospect dump.
47	2.5-ft chip	-	.5	.40	ND	ND	Vein. Adit rib.
48	4.0-ft chip	-	-	ND	ND	ND	Vein. Adit face.
49	7.0-ft chip	Tr	.9	.22	.52	ND	Quartz vein. Prospect wall.
50	Grab	Tr	6.5	.53	ND	ND	Altered granite with minor hematite and limonite. Adit stockpile.
51	1.3-ft chip	Tr	35.7	.57	ND	ND	Monzonite with malachite and chrysocolla. Prospect wall.
52	2.5-ft chip	-	5.8	.27	.34	ND	Shear zone in monzonite with malachite, azurite, and chrysocolla. Prospect wall.
53	Specimen	-	4.9	.82	ND	ND	Quartz from vein. Adit dump.
54	Grab	-	.4	.02	ND	ND	Dripping Spring Quartzite, with minor calcite and pyrite. Adit dump.
55	Grab	Tr	3.5	.31	.62	ND	Quartz. Shaft ore chute.
56	Chip	-	-	ND	ND	ND	Schist with malachite. Prospect wall.
57	Chip	-	-	ND	ND	ND	Do.
58	8.4-ft chip	Tr	Tr	ND	ND	ND	Schist with malachite, azurite, and chrysocolla. Prospect wall.
59	6.8-ft chip	-	.1	ND	ND	ND	Basalt(?); iron stained. Prospect wall.
60	6.0-ft chip	-	1.0	.14	.10	ND	Shear zone. Shaft collar.
61	7.3-ft chip	-	Tr	ND	ND	ND	Tuff breccia. Adit back.
62	2.9-ft chip	Tr	Tr	ND	ND	ND	Tuff; no mineralization visible. Adit face.
63	2.4-ft chip	Tr	.1	ND	ND	ND	Tuff; shear zone. Adit face.
64	4.0-ft chip	-	Tr	ND	ND	ND	Tuff; no mineralization visible. Adit face.
65	Grab	-	-	ND	ND	ND	Tuff. Caved adit dump.
66	Grab	Tr	-	ND	ND	ND	Do.
67	Grab	-	.1	ND	ND	ND	Welded tuff; no mineralization visible. Shaft dump.
68	1.8-ft chip	-	.1	ND	ND	ND	Silicified tuff. Prospect wall.
69	Grab	-	-	ND	ND	ND	Tuff; no mineralization visible. Prospect dump.
70	Chip	-	-	ND	ND	ND	Tuff. Outcrop.

Table J1.--Descriptions and results of analyses of samples from the Superstition Wilderness and contiguous roadless areas, Gila, Maricopa, and Pinal Counties, Arizona-Continued

Sample No.	Sample Type	Gold	Silver	Copper	Lead	Zinc	Descriptions
71	1.3-ft chip	-	.1	ND	ND	ND	Ash-flow tuff; no mineralization or alteration observed. Prospect wall.
72	Specimen	-	-	ND	ND	ND	Contact between dacite and tuff. Shaft dump.
73	1.8-ft chip	-	Tr	ND	ND	ND	Welded tuff. Adit back.
74	3.0-ft chip	-	.1	ND	ND	ND	Welded tuff. Adit right rib.
75	3.4-ft chip	-	-	ND	ND	ND	Welded tuff; no mineralization visible. Adit face.
76	1.6-ft chip	-	-	ND	ND	ND	Hematite-stained fault gouge. Adit.
77	Specimen	-	-	ND	ND	ND	Quartz at contact between granite and schist. Caved adit dump.
78	Grab	-	.1	.66	ND	ND	Schist and quartz with minor malachite and chrysocolla. Caved adit dump.
79	Specimen	-	-	ND	ND	ND	Bull quartz. Prospect dump.
80	4.8-ft chip	-	.1	ND	ND	ND	Schist with sericite. Prospect wall.
81	3.3-ft chip	Tr	-	ND	ND	ND	Granite; feldspars altered to clay and sericite; no mineralization visible. Adit face.
82	3.2-ft chip	Tr	.1	ND	ND	ND	Granite; shear zone with copper oxide. Adit.
83	3.4-ft chip	Tr	.2	ND	ND	ND	Altered granite with hematite stain. Prospect wall.
84	5.0-ft chip	-	Tr	ND	ND	ND	Granite. Prospect wall.
85	3.3-ft chip	-	-	ND	ND	ND	Andesite altered to clay. Adit face.
86	3.0-ft chip	Tr	.1	ND	ND	ND	Andesite altered to clay; minor malachite. Caved shaft.
87	2.3-ft chip	-	.1	ND	ND	ND	Altered dike in rhyolite(?). Prospect wall.
88	8.9-ft chip	Tr	.1	ND	ND	ND	Altered andesite with malachite and chrysocolla. Prospect wall.
89	1.6-ft chip	-	Tr	ND	ND	ND	Rhyolite; intrusive contact zone with minor malachite. Prospect wall.
90	4.3-ft chip	-	.1	ND	ND	ND	Rhyolite. Prospect wall.
91	4.0-ft chip	-	Tr	ND	ND	ND	Rhyolite. Prospect wall.
92	3.0-ft chip	Tr	Tr	ND	ND	ND	Altered volcanic breccia; no mineralization visible. Adit face.
93	Grab	Tr	.1	ND	ND	ND	Muck pile at adit drift face.
94	4.3-ft chip	-	Tr	ND	ND	ND	Rhyolite. Adit back.
95	1.0-ft chip	-	-	ND	ND	ND	Siliceous fault zone; malachite stain. Prospect wall.
96	1.2-ft chip	Tr	.3	.31	.53	ND	Rhyolite; minor malachite and chrysocolla in vicinity. Prospect wall.
97	0.7-ft chip	.02	.6	1.6	ND	ND	Rhyolite; fault gouge with malachite and azurite. Prospect wall.
98	4.5-ft chip	Tr	.2	ND	ND	ND	Rhyolite; hematite stained, minor malachite and chrysocolla in random 1/4-inch seams. Shaft wall.
99	3.5-ft chip	Tr	.1	ND	ND	ND	Silicified fault breccia, volcanic; hematite stained. Adit face.
100	1.0-ft chip	Tr	.1	.34	ND	ND	Weathered granite; moderate malachite and chrysocolla. Prospect wall.
101	1.2-ft chip	Tr	Tr	1.8	ND	.82	Argillic dike with malachite, azurite, and chrysocolla. Prospect wall.
102	0.7-ft chip	Tr	.1	.59	ND	ND	Schist with malachite and chrysocolla, some hematite. Prospect wall.

Table J1.--Descriptions and results of analyses of samples from the Superstition Wilderness and Contiguous roadless areas, Gila, Maricopa, and Pinal Counties, Arizona-Continued

Sample No.	Sample Type	Gold	Silver	Copper	Lead	Zinc	Descriptions
103	2.5-ft chip	.01	.9	1.3	1.5	ND	Dacite with malachite and chrysocolla in stringered veinlets. Adit rib.
104	0.3-ft chip	.01	.2	6.5	13.1	.60	Dacite agglomerate; malachite, azurite, and chrysocolla in vein. Discovery prospect wall.
105	2.8-ft chip	.02	Tr	ND	ND	ND	Rhyolite; hematite-stained and altered vein; no mineralization visible. Prospect wall.
106	0.5-ft chip	.01	.1	ND	ND	ND	Dacite agglomerate; vein. Adit raise.
107	4.5-ft chip	Tr	.1	ND	ND	ND	Dacite agglomerate. Adit crosscut face.
108	0.5-ft chip	Tr	.1	ND	ND	ND	Altered rhyolite; sample from faulted(?) location. Prospect wall.
109	4.0-ft chip	Tr	.3	ND	ND	ND	Dacite(?) breccia; shear zone. Shaft.
110	Specimen	.80	.1	4.6	.12	ND	Dacite; minor blebs of turquoise(?) and chrysocolla; 0.10% WO_3. Shaft dump.
111	Chip	Tr	1.6	2.1	.35	ND	Quartzose shear zone; some turquoise(?); 0.03% WO_3. Shaft collar.
112	Chip	.11	.1	1.0	.10	ND	Quartzose, oxidized material; 0.05% WO_3. Prospect wall.
113	3.2-ft chip	Tr	.1	ND	ND	ND	Dacite(?) breccia; shear zone, no mineralization visible. Adit rib.
114	0.5-ft chip	Tr	-	ND	ND	ND	Dacite tuff; siliceous fault zone. Prospect wall.
115	Chip	-	-	ND	ND	ND	Welded dacite tuff; siliceous fault zone. Prospect wall.
116	Grab	-	-	ND	ND	ND	Tuff. Adit dump.
117	Grab	Tr	-	ND	ND	ND	Ash-flow rhyodacite tuff. Prospect.
118	Chip	-	-	ND	ND	ND	Welded tuff; siliceous fault zone. Prospect wall.
119	5.0-ft chip	-	Tr	ND	ND	ND	Caliche-cemented surface detritus. Adit face.
120	Grab	-	Tr	ND	ND	ND	Red dirt; natural pothole in volcanic rock--"Indian paint"--near "Indian Paint Mine."
121	4.6-ft chip	-	-	ND	ND	ND	Dacite(?); bright red. Adit rib.
122	2.7-ft chip	-	.1	ND	ND	ND	Brecciated dacite; no mineralization visible. Adit face.
123	2.6-ft chip	-	-	ND	ND	ND	Brecciated dacite; fault gouge, no mineralization visible. Adit portal.
124	2.6-ft chip	-	.1	ND	ND	ND	Rhyolitic ash flow. Prospect wall.
125	Grab	Tr	Tr	ND	ND	ND	Altered rhyolite; no mineralization visible. Shaft dump.
126	Specimen	-	-	ND	ND	ND	Dacite tuff. Prospect dump.
127	Chip	No analysis					Serpentinized limestone with asbestos--1/2-inch harsh fiber. Outcrop.
128	Specimen	Tr	Tr	ND	ND	ND	Volcanic rock; highly mineralized and iron rich. Hillside float.
129	1.4-ft chip	Tr	Tr	ND	ND	ND	Diabase; highly altered. Prospect wall.



Base from U.S. Geological Survey, 1:24,000
Haunted Canyon, Iron Mountain, 1948; Golfield, 1956;
Horse Mesa Dam, Mormon Flat Dam, Pinyon Mountain,
Two Bar Mountain, 1964; Weavers Needle, 1966

SCALE 1:48 000

CONTOUR INTERVAL 20 AND 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ARIZONA
AREA OF MAP

Samples collected by J. E Jinks, 1980

PROSPECT WORKINGS AND SAMPLE LOCATIONS IN THE SUPERSTITION WILDERNESS AND CONTIGUOUS ROADLESS AREAS, MARICOPA, PINAL, AND GILA COUNTIES, ARIZONA

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

OPEN-FILE REPORT
83-885
SHEET 2 OF 3

Base from U.S. Geological Survey, 1:24,000
Haunted Canyon, Iron Mountain, 1948; Goldfield, 1956;
Horse Mesa Dam, Mormon Flat Dam, Pinyon Mountain,
Two Bar Mountain, 1964; Weavers Needle, 1966

SCALE 1:48 000

1 ½ 0 1 2 3 MILES

1 .5 0 1 2 3 4 5 KILOMETERS

CONTOUR INTERVAL 20 AND 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ARIZONA
AREA OF MAP

Samples collected by D.W. Peterson, D.L. Gaskill,
M.L. Sorensen, W.E. Yeend, N.H. Suneson, K.L. Stark,
and G.D. Johnpeer, 1975-77

LOCATIONS OF ROCK AND STREAM-SEDIMENT SAMPLES, SUPERSTITION WILDERNESS AND VICINITY, ARIZONA

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

OPEN-FILE REPORT
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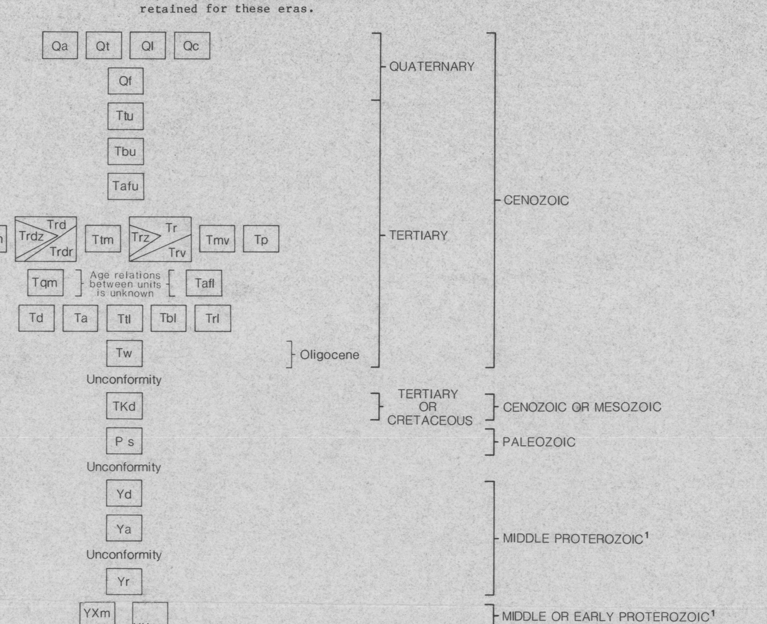
SHEET 1 OF 3

CORRELATION OF MAP UNITS

[1]The Early (2,500-1,600 m.y.), Middle (1,600-900 m.y.), and Late (900-570 m.y.) Proterozoic Eras have been adopted by the U.S. Geological Survey, replacing the terms Proterozoic X, Y, and Z (=Precambrian X, Y, and Z), respectively; the map symbols X, Y, and Z are retained for these eras.



DESCRIPTION OF MAP UNITS
(All thicknesses are approximate)

Qa ALLUVIUM (QUATERNARY)--Unconsolidated sand and gravel deposits along streambeds and in partly enclosed basins

Qt TALUS (QUATERNARY)--Accumulations of loose angular blocks broken from nearby slopes

Ql LANDSLIDE DEPOSITS (QUATERNARY)--Rock masses that have slid downslope largely as coherent units. Commonly brecciated, but some relatively unbroken rocks within the mass

Qc COLLUVIUM (QUATERNARY)--Deposits of unconsolidated to partly consolidated slope wash derived from nearby rocks

Qf FANGLOMERATE (QUATERNARY)--Generally poorly consolidated gravel and sand derived from nearby rocks. May form relatively thin cover over bedrock

Ttu UPPER TUFF (TERTIARY)--Crudely to well-defined beds of epiclastic breccia. Angular clasts of rhyolite in a poorly sorted reworked matrix of predominantly pyroclastic material. Outcrop color chiefly pale grayish yellow. 800 ft thick

Tbu UPPER BASALT (TERTIARY)--Hard dense aphanitic basaltic lava flows; small phenocrysts of plagioclase and olivine; dark gray to black. 150 ft thick

Tafu UPPER ASH-FLOW TUFF (TERTIARY)--Ash flows, with 15 to 30 percent phenocrysts of plagioclase, sanidine, quartz, and biotite in a matrix that varies from densely welded to nonwelded; includes outflow bodies near Canyon Lake that are part of extensive units to the north and west. 200 ft thick

Tafm MIDDLE ASH-FLOW TUFF (TERTIARY)--Poorly to distinctly layered ash flows contemporaneous with and intermixed with middle tuff and lava flows. Distribution limited to west and northwest flanks of Coffee Flat Mountain. 400 ft thick

Trd RHYODACITE (TERTIARY)--Lava flows, generally 20 to 40 percent phenocrysts of quartz, plagioclase, sanidine, biotite, and hornblende; matrix light to medium gray, reddish gray. Distinct flow structures, locally contorted; vitrophyre and breccia at base and margins, some zones extensively zeolitized. Maximum thickness about 700 ft. Flows issued from several discrete vents. Unit as mapped also contains rhyolite and tuff. Zeolitized rhyodacite and rhyodacite vents mapped separately:

Trdz Zeolitized rhyodacite

Trdv Rhyodacite vents

Ttm MIDDLE TUFF (TERTIARY)--Includes air-fall, water-laid, and ash-flow tuff, bedded to nonbedded, fine- to coarse-grained, poorly to well-sorted. Generally zeolitized, pale grayish yellow. May be intimately intermixed with rhyolite and rhyodacite lava flows. 500 ft thick

Tr UPPER RHYOLITE (TERTIARY)--Lava flows, generally less than 10 percent phenocrysts that include chiefly quartz, feldspar, and biotite; matrix light to medium gray. Flow structures typically highly contorted; glass and breccia common at base and margins, some zones strongly zeolitized. Maximum thickness about 1,800 ft. Flows issued from several discrete vents. Unit as mapped also contains rhyodacite and tuff. Zeolitized rhyolite and rhyolite vents mapped separately:

Trz Zeolitized rhyolite

Trv Rhyolite vents

Tmv MIXED VOLCANIC ROCKS (TERTIARY)--A complex intermixed unit of lava flows of different compositions, ranging from rhyolite to andesite, and tuff. 500 ft thick

Tp PORPHYRITIC DIKES (TERTIARY)--Dikes of chiefly rhyodacite and rhyolite composition; well-formed phenocrysts of feldspar, quartz, and mafic minerals. Locally highly brecciated; locally altered. Some dikes as much as 200 ft wide

Tafl LOWER ASH-FLOW TUFF (TERTIARY)--Ash flows, with 25 to 40 percent phenocrysts of plagioclase, quartz, sanidine, and biotite in a matrix that varies from densely welded to nonwelded. Some sections have several cooling units, others only a single cooling unit. Vitrophyre near base in deposits in northeastern section, lacking elsewhere. 2,000 ft thick

Tqm QUARTZ MONZONITE (TERTIARY)--Phenocrysts of plagioclase, potassium feldspar, and quartz in a very fine grained groundmass of feldspar and quartz; accessory biotite, epidote, opaque oxides, sphene apatite. Phenocrysts and groundmass extensively hydrothermally altered; miarolitic cavities lined with quartz

Td DACITE (TERTIARY)--Lava flows, generally 15 to 30 percent phenocrysts of variable composition. Plagioclase generally present, widely variable amounts of quartz, sanidine, biotite, hornblende, sphene, and epidote. Matrix varies from light gray to dark gray; composition locally includes not only dacite but latite, rhyodacite, and andesite. Commonly considerably altered to clay, zeolite, and other products. Forms thick flows of local extent, possibly domes. Upper part locally interlayered with basal units of overlying ash-flow tuff. 800 ft thick

Ta ANDESITE (TERTIARY)--Lava flows and volcanic flow breccia of andesitic fragments. Small to large phenocrysts of plagioclase, pyroxene, and amphibole in medium-gray matrix of plagioclase, pyroxene, and opaque oxides. Commonly partly altered to clay, and chlorite. 300 ft thick

Ttl LOWER TUFF (TERTIARY)--Includes air-fall and water-laid tuff, bedded to nonbedded, fine- to coarse-grained, poorly to well-sorted. Commonly zeolitized, ranges from pale grayish yellow to brown to gray. Commonly intermixed with contemporaneous lava flows. 200 ft thick

Tbl LOWER BASALT (TERTIARY)--Lava flows, locally grading to volcanic flow breccia of basaltic fragments. Small phenocrysts of plagioclase, pyroxene, and olivine in dark- to medium-gray matrix of chiefly plagioclase, pyroxene, and opaque oxides. Locally vesicular or amygdaloidal. Commonly partly altered to clay, and chlorite. 600 ft thick

Trl LOWER RHYOLITE (TERTIARY)--Lava flows, sparse to 15 percent phenocrysts of plagioclase, sanidine, quartz, and biotite; matrix light to medium gray. Flow structures typically lightly contorted; glass, breccia, and zeolitized facies common. 800 ft thick

Tw WHITETAIL CONGLOMERATE (OLIGOCENE)--Angular to subrounded pebbles and cobbles in coarse-grained arkosic matrix, poorly to well-consolidated. Bedding generally indistinct, but locally well bedded. Fragments derived from all older rocks; diabase, quartzite, limestone are most common. Maximum thickness about 800 ft

TKd PORPHYRY AND FELSITE DIKES (TERTIARY OR CRETACEOUS)--Generally dikes, but locally widen to small elongated plutons. Mostly silicic in composition, but generally so altered that specific rock name cannot be assigned. Phenocrysts in porphyry dikes were originally plagioclase and one or more mafic minerals. Felsite and the matrix of the porphyry are generally light gray and are extensively altered to clay and possibly other products. Associated with mineralized rocks near the JF Ranch. As mapped, includes aplitic dikes of Proterozoic age

Pzs SEDIMENTARY ROCKS, UNDIVIDED (PALEOZOIC)--Consists of units not shown separately on map:

Escabrosa Limestone (Mississippian)--Limestone coarse- to fine-grained, pale- to medium-gray. Most prominent outcrops are massive thick-bedded cliff-forming beds, though upper part of formation includes thin and medium beds. Commonly fossiliferous with horn corals, brachiopods, and gastropods. Thickness 300 ft

Martin Limestone (Devonian)--Thin bedded limestone 13 to 26 ft thick. Shale 20 ft thick; thin-bedded, fissile, calcareous. Limestone and dolomite 100 to 260 ft thick; thin- to medium-bedded, some pure, some with admixed clastic grains, including frosted quartz sand; some silty limestone beds contain abundant brachiopods; includes one to three hard quartzite beds. Conglomerate 1.6 to 20 ft thick; angular pebbles of quartzite, schist, and granite in a coarse-grained matrix. Total thickness 150 to 330 ft

Bolsa Quartzite (Cambrian)--(Incorrectly identified as Troy Quartzite in Peterson, 1960). Mostly thin to medium beds of arkosic quartzite, interbedded locally with siltstone, mudstone, and shale, and a basal layer of conglomerate with angular pebbles of quartzite, schist, and granite in a coarse-grained arkosic sandstone. Thickness 200 ft

Yd DIABASE (MIDDLE PROTEROZOIC)[1]--Sills and dikes. Diabase composed of subhedral and euhedral plagioclase and pyroxene with ophitic and subophitic texture; minor amphibole, biotite, and opaque oxides. Generally medium grained; locally ranges from coarse grained to aphanitic. Weathers dark brown and olive green

Ya APACHE GROUP (MIDDLE PROTEROZOIC)[1]--Consists of units not shown separately on map:

Basalt--Aphanitic basalt; microscopic plagioclase partly altered to clay, and calcite; microscopic pyroxene and olivine largely altered to chlorite, iddingsite, and opaque oxides. Dark gray to dark brown; locally vesicular and amygdaloidal. Some layers autobrecciated. Thickness 130 ft

Mescal Limestone--Dolomite and limestone, generally thin bedded with undulating to even bedding planes; texture generally aphanitic or fine grained, locally grades to coarse grained. Medium gray to light brown to white. Interbedded black to light-brown chert occurs as uneven layers or individual nodules. Near top an algal member contains wavy concentric stromatolite structures. Thickness 330 ft

Dripping Spring Quartzite--Divided into:

Siltstone member--Alternating beds of very fine grained feldspathic quartzite and thin-bedded arkose and siltstone. Light gray to light brown on fresh surfaces; strong shades of brown, red, yellow on weathered surfaces. Thickness 165 to 400 ft

Arkose member--Medium- to coarse-grained feldspathic quartzite and arkose, medium to thick bedded, locally crossbedded, some beds separated by siltstone partings. Light brown, yellowish gray, pale reddish brown. Thickness 130 to 260 ft

Barnes Conglomerate Member--Well-rounded ellipsoidal pebbles and cobbles of gray and brown quartzite, white quartz in matrix of medium- to coarse-grained poorly sorted arkosic quartzite. Thickness 3 to 20 ft

Pioneer Formation--Divided into:

Siltstone member--Siltstone, shale, and fine-grained arkose; dusky purple and dusky red, speckled by light-brown to greenish-yellow spots; thin bedded. Thickness 100 to 230 ft

Arkose member--Arkose, feldspathic quartzite, and sandstone; light brown, dark brown, dusky red purple, medium to thin bedded; sandy beds separated by thin beds of siltstone and shale. Thickness 115 to 180 ft

Scanlan Conglomerate Member--Well-rounded to subangular pebbles of quartz and quartzite and angular pebbles and granules of schist and granite in coarse-grained poorly sorted matrix of arkose; firmly cemented. Outcrop medium to dark gray and reddish gray. Thickness 0.3 to 16 ft

Yr RUIN GRANITE (MIDDLE PROTEROZOIC)[1]--Coarse-grained, porphyritic quartz monzonite to granite; euhedral phenocrysts 0.8 to 4 in. of perthitic pink microcline in holocrystalline, coarse-grained, hypidiomorphic granular groundmass of plagioclase, microcline, quartz, biotite; accessory sphene, iron oxide, zircon, apatite. Grades to fine-grained varieties; includes scattered bodies of aplite, graphic granite, pegmatite, white quartz. Outcrops light brown, light gray, grayish yellow

YXm MADERA DIORITE (MIDDLE OR EARLY PROTEROZOIC)[1]--Medium- to fine-grained, holocrystalline, hypidiomorphic granular. Essential minerals--plagioclase and quartz; varietal minerals--potassium felspar, amphibole, and biotite; and accessory minerals--iron oxides, sphene, apatite, and garnet. Rock is granodiorite or tonalite. Locally foliated (gneissic). Outcrops light to medium brown to grayish yellow

YXmp MADERA DIORITE AND PINAL SCHIST, UNDIVIDED (MIDDLE? AND EARLY PROTEROZOIC)[1]

Xp PINAL SCHIST (EARLY PROTEROZOIC)[1]--Quartz-muscovite schist and quartz-muscovite-chlorite schist, with feldspar. Strong to indistinct foliation, locally highly contorted. Pods, stringers, and veins of white quartz locally abundant. Generally light to dark gray; in some places weathers brown

CONTACT, APPROXIMATELY LOCATED

FAULT, APPROXIMATELY LOCATED--Dotted where concealed. Bar and ball on downthrown side

STRIKE AND DIP

35 Bedding in sedimentary rocks

45 Layered structures in volcanic rocks

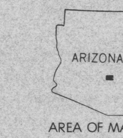
APPROXIMATE BOUNDARY OF DESIGNATED WILDERNESS

APPROXIMATE BOUNDARY OF ROADLESS AREA

Base from U.S. Geological Survey, 1:24,000
Haunted Canyon, Iron Mountain, 1948; Goldfield, 1956;
Horse Mesa Dam, Mormon Flat Dam, Pinyon Mountain,
Two Bar Mountain, 1964; Weavers Needle, 1966

SCALE 1:48 000
1 ½ 0 1 2 3 MILES
1 .5 0 1 2 3 4 5 KILOMETERS

CONTOUR INTERVAL 20 AND 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929



AREA OF MAP

Reconnaissance geology mapped by D.W. Peterson,
D.L. Gaskill, M.L. Sorensen, W.E. Yeend, N.H. Suneson,
K.L. Stark, and G.D. Johnpeer, 1975-77

RECONNAISSANCE GEOLOGIC MAP OF THE SUPERSTITION WILDERNESS AND CONTIGUOUS ROADLESS AREAS, MARICOPA, PINAL, AND GILA COUNTIES, ARIZONA

Pinal

SUPERSTITION WILDERNESS, ARIZONA

By DONALD W. PETERSON,[1] U.S. GEOLOGICAL SURVEY, and

JIMMIE E. JINKS, U.S. BUREAU OF MINES

SUMMARY

On the basis of geologic studies and mineral evaluations made between 1973 and 1977, most of the Superstition Wilderness and adjoining areas are judged to have little promise for occurrence of mineral resources. However, two areas in an east-trending zone near the southern margin of the area, marked by spotty occurrences of mineralized rock, prospect pits, and a band of geochemical anomalies that coincides with alined magnetic anomalies, are considered to have probable mineral-resource potential. This zone lies within about 6 mi of two productive mines in Arizona's great copper belt, and the trend of the zone is parallel to many of the significant mineralized structures of this belt. A small isolated uranium anomaly was found in the northeastern part of the wilderness, but no evidence of other energy resources, such as petroleum, coal, or geothermal, was found.

CHARACTER AND SETTING

The Superstition Wilderness in south-central Arizona includes about 194 sq mi; an additional contiguous area of about 50 sq mi was included in the study for a total of about 244 sq mi. The Superstition Mountains rise as a spectacular range front above the adjacent desert to the south and west and provide a scenic treat to travelers on U.S. Highway 70. Arizona State road 88 skirts the northern boundary of the wilderness and offers hints of the ruggedly dissected landscape that makes up the interior of the wilderness. Altitudes range from 1660 to 6266 ft; local relief between canyon bottoms and ridge tops ranges from a few hundred to a thousand feet, and the relief between the desert and the summit of the Superstition Mountains is 3500 ft.

The wilderness is in a region of highly diverse rock types and complex geologic structure. Rocks range in age from Middle Proterozoic to Quaternary and include metamorphic, sedimentary, and both intrusive and extrusive igneous rocks. The geology of the eastern half of the wilderness differs distinctly from that of the western half. The eastern half includes mainly Proterozoic rocks of different types that have been pervasively faulted. The rocks include schist and granite of Proterozoic age unconformably overlain by Middle Proterozoic sedimentary rocks (sandstone, quartzite, shale, conglomerate, and limestone), all intruded by massive sills and dikes of diabase. These, in turn, are unconformably overlain by isolated remnants of Paleozoic sedimentary rocks. The Proterozoic and Paleozoic rocks have been extensively faulted on an intricate scale chiefly by discontinuous high-angle normal faults of various orientations. Fault blocks have been tilted in diverse directions; the attitude of strata within individual fault blocks is relatively uniform, whereas attitudes vary widely from one block to another. These rocks are locally overlain by volcanic rocks of Tertiary age.

The western half of the wilderness consists chiefly of Tertiary volcanic rocks of many different types. The most abundant are thick deposits of ash-flow tuff; these are overlain, underlain, and intruded by rhyolitic, dacitic, and basaltic lavas. The volcanic rocks were erupted from many different vents that lie within or near the wilderness, and, as is characteristic of volcanic source areas, the rocks are locally highly contorted and bear complex relationships with one another. The roots of one or more collapsed calderas that are the source of the voluminous ash-flow tuff may lie within the wilderness. Spectacular canyons have been cut into the volcanic rocks, and in some places erosion has carved intricate and fantastic forms for which the Superstition Mountains are famous.

[1]With contributions from D. L. Gaskill, M. L. Sorensen, W. E. Yeend, W. R. Miller, J. M. Motooka, J. C. Wynn, K. L. Stark, N. H. Suneson, and G. D. Johnpeer, USGS, and F. E. Williams, H. C. Meeves, L. S. Griffiths, and J.A.T. Fallin, USBM.

The USBM, at intervals from 1973 to 1977, examined mining claims, prospects, and the few accessible mine workings showing evidence of mineralization. The USGS, at intervals from 1975 to 1977, carried out reconnaissance geologic mapping and geochemical sampling for analyses. Aeromagnetic mapping and a gravity survey were also carried out. Analytical results were compiled by Motooka and others (1978), and gravity results by Wynn and Manydeeds (1978).

MINERAL RESOURCES

The southern and eastern boundaries of the area studied are within 6 mi of large copper mines; the mines of the Globe, Miami, and Superior areas, which have had copper and precious-metal production exceeding $2 billion, lie within 20 mi of the wilderness. In spite of this proximity and intensive prospecting throughout terrane that resembles the geology around the major mineral deposits, little mining activity has resulted within and adjacent to the wilderness.

Legal records reveal that no mining claims have been patented or mineral leases effected within the wilderness or the adjoining areas. Notices of claims filed through the years indicate a low level of prospecting activity during recent years, and most claims have not been maintained.

Abundant pits, shafts, and adits dot an east-west zone along the southern margin of the wilderness. Material found on dumps shows that the workings encountered appreciable mineralized ground, particularly in two areas designated here as the JF area (SE part of wilderness) and the Peralta Canyon area (SW part of wilderness). Valid claims have been maintained in the areas and although almost all workings are inaccessible and could not be examined both areas have a probable mineral-resource potential. In the JF area, hydrothermal alteration and copper, lead, zinc, and silver mineralization are found in both schist and granite in an elongate zone extending from about 1.5 mi south of the JF Ranch for about 4 mi in an east-northeast direction toward Iron Mountain; the vaguely defined zone is as much as 1.5 mi wide and lies both within and outside the wilderness.

In the Peralta Canyon area, mineralized ground in an east-northeast trending zone from 1 mi west of the mouth of Peralta Canyon eastward for about 4 mi has been explored by several small operations. Alteration and mineralization of base and precious metals occur both in Proterozoic granite and Tertiary volcanic rocks, and they are associated, at least in part, with an east-northeast trending range-front fault. A few claims are maintained, but no recent exploration activity is known.

A small amount of mineralization evidently occurs along a siliceous vein in a mine near the western margin of the wilderness, about 2 mi southeast of the community of Goldfield. The workings are inaccessible.

An important control of ore deposits in the Globe-Miami mining district (6–20 mi east of the wilderness) is postulated to be the east-northeast trending contact between Proterozoic schist and granite (Peterson, 1962). Granitic stocks of Late Cretaceous or early Tertiary age intruded this ancient zone of weakness, carrying mineralizing fluids that solidified to form the important ore deposits. A reconnaissance of the geology of the area undertaken as part of this study showed that the contact between the ancient schist and granite extends westward across the southern part of the wilderness. A band of geochemical anomalies with high values of copper, lead, zinc, silver, and other metals extends across the southern part of the wilderness and straddles the ancient contact. An east-west series of magnetic low anomalies is also alined roughly along the contact. No large intrusive bodies of younger Cretaceous or Tertiary age were found in proximity to the contact, although a north-trending dike swarm has intruded schist just north of the contact in an area just west of Iron Mountain (JF area). These dikes could be outliers of a larger concealed intrusive body. The possibilities are intriguing because of the alteration and mineralization in the JF area. Owing to these combined factors, the two areas along the southern margin of the wilderness are designated as having probable mineral-resource potential.

Another possibility for undiscovered minerals would be a deposit concealed beneath the Tertiary volcanic rocks. The only hint of such a deposit is a tongue-like geochemical anomaly extending north-northwest from the Peralta Canyon area and no resource potential is identified.

Anomalously high values of uranium and thorium were detected in a number of rock and stream-sediment samples near the northeastern corner of the wilderness (Peterson and Jinks, 1983).

Although the Superstition Mountains are well known for legends of lost gold, the general geologic environment holds little promise for an important gold deposit that could have been found using the techniques of 19th century prospecting. The Lost Dutchman mine can likely be relegated to the store of folk tales that extend and embellish historical reality.

SUGGESTIONS FOR FURTHER STUDIES

Most of the wilderness holds little promise for identification of mineral resources. The areas indicated as having probable mineral-resource potential will need

detailed geologic mapping and exploration to determine the feasibility of realizing this potential.

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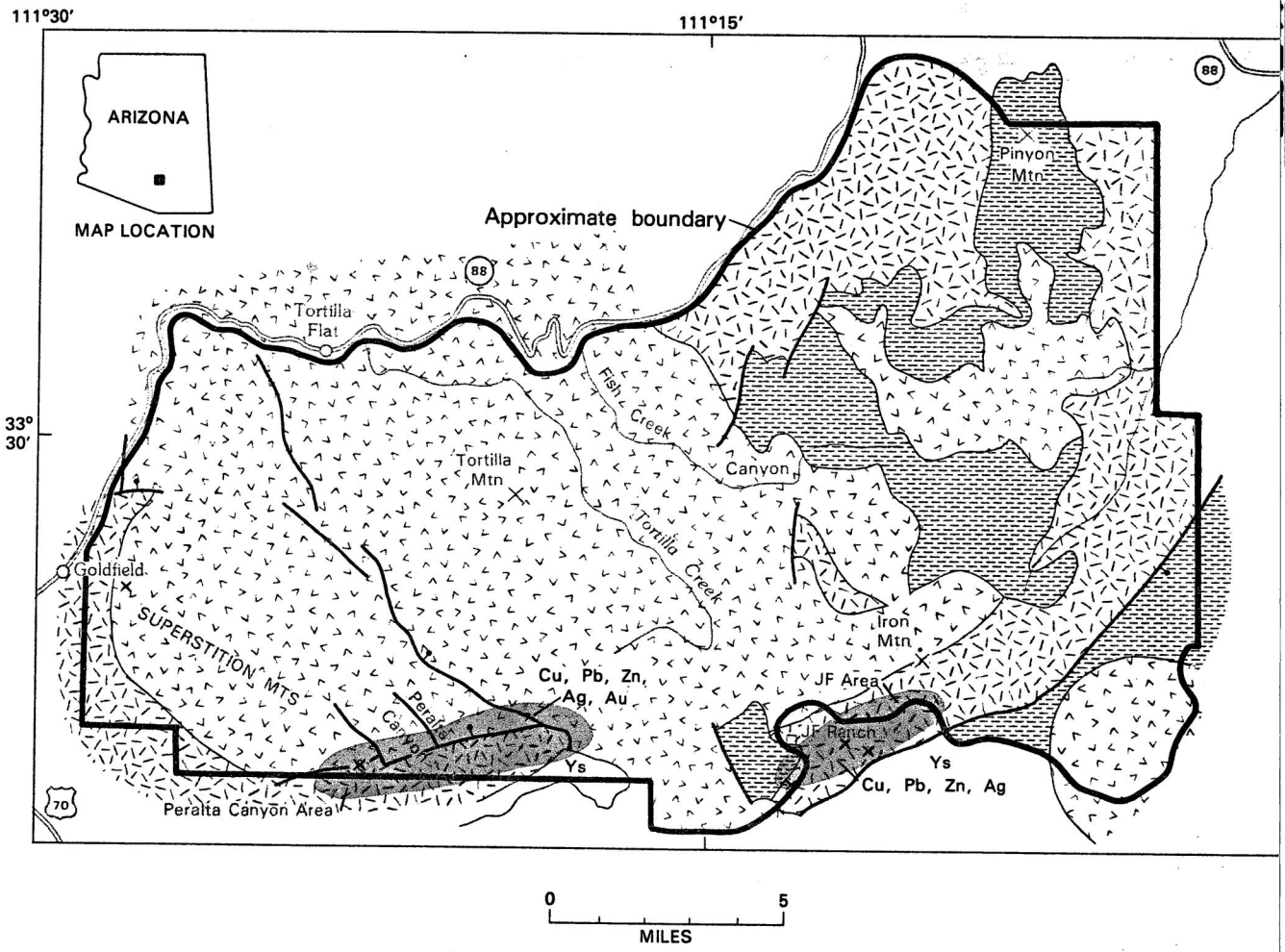

EXPLANATION

Geologic terrane with probable mineral-resource potential

Cu Copper

Au Gold

Pb Lead

Ag Silver

Zn Zinc

× Mineral occurrence

Volcanic rocks (Tertiary)

Sedimentary rocks (Paleozoic and Proterozoic)

Granite (Proterozoic)

Ys Schist (Proterozoic)

Contact

Fault--Bar and ball on downthrown side

Figure 31.—Superstition Wilderness, Arizona.