

SUBSURFACE TEMPERATURE MAPS

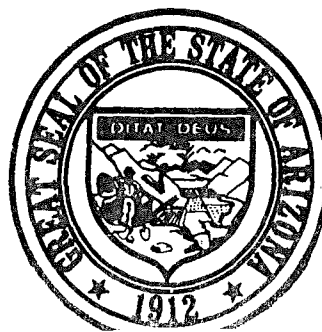
STATE OF ARIZONA

JUNE

1977

09-18

ARIZONA OIL AND GAS CONSERVATION COMMISSION
MAPS GT-3A AND GT-3B



TEMPERATURE-DATA TABULATION

TO ACCOMPANY

TEMPERATURE MAP OF SUBSURFACE BASEMENT ROCKS

MAP NUMBER GT-3A

AND

TEMPERATURE MAP OF SUBSURFACE SUPRABASEMENT ROCKS

MAP NUMBER GT-3B

STATE OF ARIZONA

BY

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JUNE 1977

ARIZONA OIL AND GAS CONSERVATION COMMISSION

Chairman, Ralph W. Bilby

Executive Secretary, John Bannister

PUBLISHED AND FOR SALE BY THE ARIZONA OIL AND GAS CONSERVATION COMMISSION

PHOENIX, ARIZONA

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(Plates in envelope containing bound text)

- Plate 1. Temperature map of subsurface basement rocks in Arizona, GT-3A
- Plate 2. Temperature map of subsurface suprabasement rocks in Arizona, GT-3B

INTRODUCTION

This publication presents a tabulation of the temperature and associated data of subsurface rocks and two maps showing the location of wells for which temperature information is available in the files of the Oil and Gas Conservation Commission. Most of this information consists of the bottom-hole temperatures measured by geophysical log surveys of wells drilled for oil, natural gas, and helium in the northeastern portion of the Colorado Plateau tectonic province of Arizona. It represents the first phase of a subsurface temperature project designed primarily for the use of earth scientists interested in the geothermal-energy potential of the state.

The second phase of the project will present surface water temperature and associated data of numerous wells drilled for irrigation and other purposes located mostly in the Basin and Range tectonic province of Arizona.

PURPOSE AND SCOPE

Although the primary purpose of both phases of the project is directed toward determining the geothermal-energy potential of the state, it furnished some information applicable to petroleum. Such applications of temperature data include correlation, geophysical log interpretation, reservoir engineering, relation to secondary migration and hydrodynamics, origin and maturation of hydrocarbons, and evaluation of borehole conditions.

Insufficient data precluded any attempt to adjust the tabulated temperature gradients for the numerous factors that influence borehole temperature measurements. The major factors are drilling processes and thermal conductivity. Other less significant factors include borehole contents and convection currents, subsurface water flow, geologic age, local sources of radioactivity, and intrusive masses. However, an attempt was made to identify the lithology of basement rock and to indicate the presence of igneous rock intrusions into sedimentary rocks opposite temperature measurements in the boreholes.

EXPLANATION OF TEMPERATURE-DATA TABLE

LITHOLOGY* OF BASEMENT ROCKS

G	Granite
Gr	Granite residue
I	Igneous, undifferentiated
la	Igneous, acidic
lb	Igneous, basic
M	Metamorphic
Q	Quartzite
V	Volcanic

**(As reported in manuscript sample descriptions, operators' completion reports, Arizona Bureau of Mines Bulletin 185, and on American Stratigraphic Company logs)*

GEOLOGIC SYSTEM OR ERA OF SUPRABASEMENT ROCKS

CZ	Cenozoic
T	Tertiary
K	Cretaceous
P	Permian
PPN	Permian-Pennsylvanian
PN	Pennsylvanian
MI	Mississippian
DE	Devonian
C	Cambrian
H	Halite

(I-, V-, H-, (Lithology opposite thermometer)

Temperature Measurements - Type	
3000	- Bottom hole, geophysical log
3000T	- Temperature survey
3000D	- Drill stem test
3000R	- Reservoir test



O&GCC ID No.	Location T - R - S	Mean Annual Temperature (°F)	Temperature (°F)	Depth (Ft)	Temperature Gradient (°F/100 Ft)	Basement (Lithology)	Suprabasement (Geologic System)	O&GCC ID No.	Location T - R - S	Mean Annual Temperature (°F)	Temperature (°F)	Depth (Ft)	Temperature Gradient (°F/100 Ft)	Basement (Lithology)	Suprabasement (Geologic System)	
APACHE COUNTY																
W221	8N-29E- 7	46	102	1525T	3.67		P	526	35N-27E-31	49	84	2280D	1.5		DE	
370	10N-24E- 4	49	106	4587	1.24	Q					82	1963D	1.7		MI	
207	10N-30E-27	50	102	2351	2.21	G		354	35N-28E- 5	50	113	3029	2.08	M		
98	13N-25E-12	53	94	3676	1.12	M		461	-25	50	112	2996	2.07	M		
655	15N-25E-30	55	90	3653	0.96	Ia		463	35N-29E- 1	47	115	5725	1.2		PN	
442	17N-26E- 3	55	100	3781	1.19	G		594	-15	49	97	3396	1.4		MI	
1-34	17N-29E-27	51	112	1620	3.8		P	478	-25	49	106	3861	1.48	Ib		
63	18N-25E-21	55	80	526	4.75		P	395	35N-30E- 3	47	100	4242	1.25	G		
57	-23	55	157	3453	2.95	G		525	- 4	47	98	3972	1.3		PN	
210	19N-25E-11	52	75	847	2.7		P	385	- 5	47	122	4565D	1.64	G		
184	-25	53	80	930	2.9		P				98	4563	1.12	G		
190	-36	53	79	755	3.4		P				95	3982D	1.2		PN	
157	19N-26E- 1	52	81	1077	2.7		P	381	- 5	47	100	4123	1.3		MI	
81	- 2	51	80	1051	2.8		P				100	3851	1.4		PN	
37	- 4	51	116	1198	5.4		P	388	- 6	47	90	4280	1.00	G		
196	- 5	52	79	941	2.9		P				92	3330R	1.35		PN	
123	-12	52	85	1098	3.0		P	400	- 6	47	101	4601	1.2		MI	
177	-14	52	85	820	4.0		P	393	- 8	47	97	4849	1.03	Ib		
214	-21	52	89	925	4.0		TR				120	4806D	1.52	Ib		
465	-26	53	88	1279	2.7		P				90	4030	1.1		PN	
149	-27	53	75	957	2.3		P	501	-10	46	109	4974	1.3		DE	
87	-28	53	84	903	3.4		P	426	-14	46	112	5336	1.24	M		
273	19N-27E- 1	52	96	1420	3.1		P	452	-15	47	98	4077	1.25	G		
124	- 3	52	79	1280	2.1		P	454	-35	47	96	3963	1.24	G		
236	- 4	52	90	1057	3.6		P									
206	- 5	52	85	1100	3.0		P	325	36N-22E-14	50	109	6689	0.88	G		
204	- 6	52	72	1059	1.9		P	345	36N-24E-23	50	110	5720	1.05	M		
250	- 8	52	90	1111	3.4		P	494	36N-27E-30	50	103	3446	1.5		MI	
109	- 9	52	101	2933	1.7		P	435	-30	50	102	3310	1.6		DE	
185	- 9	52	79	1208	2.2		PPN	612	36N-28E- 3	49	110	3895	1.6		MI	
230	-23	53	86	1557	2.1		P	300	- 6	50	102	4347	1.20	Q		
147	20N-26E- 9	50	72	1218	1.8		P	549	36N-29E- 4	49	97	3017	1.6		MI	
136	-21	50	70	1082	1.0		P				90	2820D	1.5		PN	
64	-27	51	80	1051	2.8		P	519	-11	48	100	3896	1.33	G		
											92	3291	1.3		PN	
								522	-17	48	95	3200D	1.5		PN	
											104	5033	1.1		MI	

88	-28	51	81	1075	2.8	P	401	-23	47	96	5498	0.89	Ia	
36	-34	51	94	2502	1.7	P	427	-24	47	106	4455	1.3		MI
142	-35	51	81	1086	2.8	P	431	-25	47	120	4821D	1.51	G	
108	20N-27E- 7	50	83	1128	2.9	P				102	4659D	1.2		DE
188	-11	51	90	1304	3.0	P				98	4095D	1.2		I-PN
209	-15	51	91	1243	3.2	P	421	-25	47	96	3850	1.3		MI
112	-19	51	87	1221	2.9	P	595	-32	49	100	3240	1.6		MI
134	-25	51	84	1351	2.4	P	443	-36	47	80	3875	0.85		MI
472	-25	51	84	1439	2.3	P				96	3750R	1.3		I-PN
576	-25	51	80	1381	2.1	TR	545	36N-30E- 6	49	105	3368D	1.7		PN
584	-25	51	80	1261	2.3	TR	651	-19	47	96	4672	1.0		MI
182	-26	51	80	1391	2.1	P				92	4447	1.0		PN
1-73	-26	51	83	1712	1.9	P	398	-20	48	100	3868	1.34	G	
547	-26	51	92	1290	3.2	TR	389	-29	48	98	3263	1.5		I-PN
259	-30	51	90	1265	3.1	P				92	3092R	1.4		PN
194	-31	52	81	980	3.0	P				91	2992R	1.4		PN
			88	978D	3.7	P	391	-29	48	100	3660	1.42	G	
238	-37	52	90	1087	3.5	P	396	-30	48	97	3720	1.3		MI
110	-33	52	85	1138	2.9	P				92	3430R	1.3		I-PN
140	-34	51	84	1215	2.7	P	446	-30	48	95	3865	1.22	G	
553	-36	51	82	1155	2.7	TR	417	-30	48	120	3161	2.3		I-PN
578	-36	51	85	1214	2.8	TR	390	-31	47	94	3657	1.3		PN
							416	-31	47	95	3912	1.2		I-PN
601	20N-28E-11	50	80	1045	2.9	TR				98	3831	1.3		I-PN
560	-13	50	80	1186	2.5	P	618	-31	47	95	3886	1.2		I-PN
598	-24	50	80	1205	2.5	P	384	-32	48	99	2899	1.8		I-PN
565	-25	50	80	1265	2.4	P	379	-32	47	94	3275	1.4		PN
552	-30	51	84	1300	2.5	TR				94	3087R	1.5		I-PN
592	-30	51	100	1194	4.1	TR	506	-32	48	107	2813	2.1		I-PN
596	-30	51	90	1343	2.9	TR	386	-32	47	98	3600	1.4		PN
600	20N-29E-29	50	80	1264	2.4	P	377	-32	48	95	3866	1.22	Ia	
107	21N-26E-35	50	90	1616	2.5	P	422	-33	48	107	4370	1.35	Gr?	
568	21N-28E-15	50	80	516	5.8	P	484	-33	48	93	3581	1.3		PN
567	-21	50	100	924	5.4	P	455	37N-25E- 4	51	104	5251	1.01	Q	
70	-28	50	80	1319	2.3	P	311	37N-27E- 8	51	107	4986	1.1		C?
W 42	25N-25E-24	52	87	2149	1.6	TR	476	-23	51	105	3797	1.4		MI
510	29N-24E-21	50	137	4547	1.91					103	3628	1.4		PN
1-77	31N-23E- 3	49	118	5765	1.20		520	37N-28E-24	50	105	3920	1.4		MI
W209	-29	49E	82	2657	1.2	P				110	3755D	1.6		PN
308	35N-22E- 2	50	116	6754	1.0	C	538	-32	50	104	3720D	1.5		PN
			14	6131D	1.0	C				108	3943	1.5		MI
			103	5875D	0.9	MI								
			117	5676D	1.2	MI								
			76											

¹ Meta-Precambrian or Cambrian chert

O&GCC ID No.	Location T - R - S	Mean Annual Temperature (°F)	Temperature (°F)	Depth (Ft)	Temperature Gradient (°F/100 Ft)	Basement (Lithology)	Suprabasement (Geologic System)	O&GCC ID No.	Location T - R - S	Mean Annual Temperature (°F)	Temperature (°F)	Depth (Ft)	Temperature Gradient (°F/100 Ft)	Basement (Lithology)	Suprabasement (Geologic System)
APACHE COUNTY (Continued)								17	40N-28E- 3	53	125	7356	0.5	Q	
491	37N-29E-12	50	102	4145	1.25	Ia					171	7142D	1.7		MI
			120	3703D	1.9		DE				162	7080D	1.5		MI
575	-16	50	89	3937	1.0		MI				160	6880D	1.6		PN
590	-16	50	109	3763	1.6		PN				155	6773D	1.5		PN
563	-22	50	102	3757	1.4		PN				152	6640D	1.5		PN
489	-33	50	100	3602	1.39	Ia					155	6411D	1.5		PN
298	-35	50	86	3657	0.98	Ia					150	6300D	1.5		PN
			100	3563D	1.4		DE	513	- 9	53	128	6002	1.25	Q	
591	37N-30E-30	50	90	3198	1.25		PN				122	5163D	1.3		PN
			92	3110D	1.35		PN	77	-11	53	120	6080	1.10	M	
507	-34	50	110	4600	1.30	G		116	-11	53	115	5800	1.07	Q	
593	38N-23E-13	52	110	5554	1.0		DE	106	-12	53	114	5770	1.06	Q	
280	38N-27E-20	50	102	5870	0.89	G					120	5040R	1.3		PN
			110	5771D	1.0		DE				106	1026	5.2		TR
			108	5690D	1.0		DE	628	-16	52	136	6336	1.33	Q	
			120	5555D	1.3		DE	138	-17	52	115	6341	0.99	Q	
			122	5425D	1.3		DE	94	-18	52	128	6916	1.10	Q	
415	38N-29E-16	50	95	4445D	1.0		I-PN	610		54	130	6520	1.17	Q	
			113	4444	1.4		I-PN	146	- 7	53	122	5785	1.19	Q	
			95	2843D	1.6		PN	608	- 9	54	123	5865	1.2		PN
			90	877D	4.6			176	-15	53	122	5865	1.18	Q	
497	38N-30E- 2	50	115	4983	1.3		I-D				165	5739D	2.0		MI
468	-12	50	122	4809	1.5		MI				148	5445D	1.7		PN
423	-18	50	110	5373	1.1		DE				145	4880D	1.9		PN
316	-32	50	100	4404	1.14	Ia		598	-15	53	136	5770	1.4		DE
292	39N-23E-12	52	113	6475	0.94	M					120	5406D	1.2		PN
			110	6406	0.91	M		581	-16	53	121	5753	1.2		DE
			124	6216D	1.2		DE				136	5750D	1.4		DE
			122	6159D	1.1		DE				117	5710D	1.1		MI
			122	6119D	1.1		DE				132	5526D	1.4		PN
265	-12	52	124	6325	1.14	M		615	-17	53	125	6163	1.17	Q	
412	-24	52	122	6450	1.09	M?		274	-18	53	118	6262	1.0		MI
			90	2568	1.5		P	559	-21	53	122	6111	1.1		MI
297	39N-24E- 7	52	116	6578	1.0		C				132	6000D	1.3		MI
											120	5670D	1.2		PN

			115	5520D	1.1		MI				120	5275D	1.2		PN
			110	5154D	1.1		PN				108	5221D	1.1		PN
			117	5031D	1.3		PN				115	5107D	1.2		PN
382	39N-25E-16	50	113	6026	1.05	M		566	-27	53	124	7130	1.00	Q	
272	-28	50	115	5644	1.15	M		546	40N-20E-2	55	135	7230	1.11	Ia	
305	39N-26E-19	50	105	6017	0.9		DE	W150	-3	55	111	1168	4.8		TR
			120	5640D	1.2		DE	105	-5	55	126	6419	1.11	M	
503	39N-29E-1	50	114	8461	0.8		I-DE				121	5080	1.3		PN
			126	8304D	0.9		MI	290	41N-22E-10	52	100	3029	1.6		C
247	40N-24E-8	53	120	6593	1.0		C				124	2795D	2.6		C
271	40N-25E-6	53	120	6750	1.0		C	248	41N-24E-16	52	117	6763	1.3		C
60	-11	50	135	6593	1.29	M		226	41N-25E-16	53	130	6615	1.19	M	
			156	6508D	1.6		C				124	6510R	1.1		DE
			163	6362D	1.8		C	295	-17	52	140	6350D	1.4		DE
			152	6225D	1.6		DE	245	-20	52	133	7099	1.14	M	
			155	6010D	1.7		DE				144	6530D	1.4		DE
			154	5890D	1.8		MI	200	-21	52	130	6781	1.15	M	
			127	5713	1.3		MI								
			143	5541D	1.7		MI	165	41N-26E-23	53	133	6329	1.3		PN
			142	5300D	1.7		PN				132	6201	1.3		PN
			140	5197D	1.7		PN	50	-28	52	124	6421	1.1		DE
			136	4946D	1.7		PN				104	4793	1.1		PN
			132	4796D	1.7		PN	260	-31	52	128	6500	1.2		DE
			129	4700D	1.7		PN				125	6384	1.1		DE
			128	4560D	1.7		PN	304	-33	52	106	6606?	0.82	?	
			134	4426D	1.9		PN	166	41N-27E-22	54	111	6255	0.9		PN
			113	4266	1.5		PN	528	41N-28E-1	56	100	6151	0.7		MI
			108	3123D	1.9		P	481	-2	56	106	5900	0.8		MI
95	40N-26E-20	50	111	6430	0.9		C				115	4717D	1.25		PN
			110	6342	0.9		C	490	-3	55	112	5707	1.0		MI
			158	6100D	1.8		DE				142	5253D	1.7		PN
			118	5624D	1.2		MI				142	4895D	1.8		PN
			129	4506D	1.75		PN	514	-3	55	100	6553	1.1		PN
			158	4460D	2.4		PN	22	-3	55	112	6312	0.9		C
			126	4269D	1.8		PN				134	5322	1.5		PN
			90	4232	1.2		TR				122	4292	1.6		PN
145	-30	50	110	4515	1.01	M?					109	4547R	1.2		PN
261	40N-27E-6	52	113	6792	0.9		C	28	-4	55	112	6383	0.9		DE
213	40N-28E-1	53	120	5640	1.2		MI				116	4570R	1.3		PN
			130	5640D	1.4		MI	515	-4	55	110	5010	1.1		PN
			126	5592D	1.3		MI	508	-5	55	113	5708	1.0		PN
			130	5064D	1.5		PN	118	-5	55	118	6250	1.0		MI
115	-2	53	118	5343	1.2		MI	511	-9	55	102	4992	0.9		PN
								483	-9	55	110	5168	1.1		PN

640	-23	56	117	5326	1.1		PN	<u>COCONINO COUNTY</u>							
			120	5325D	1.2		PN	71	14N-14E-30	47	105	3811	1.52	G	
			120	5230D	1.2		PN	498	17N- 6E- 6	60	88	1119	2.5		DE
232	-23	56	126	6804	1.03	M		667	17N- 9E-11	45	74	4168	0.7		DE
			120	5740R	1.1		PN				95	3926	1.3		DE
582	-23	56	120	5822D	1.1		PN	3-7	18N-15E-28	54	94	1120	3.6		P
			118	5818	1.1		PN	376	19N-10E-24	50	88	6001	0.63	G	
			120	5720D	1.1		PN								
			112	5305D	1.1		PN	240	20N-10E-26	50	92	3570	1.2		DE
663	-23	56	118	5442	1.1		PN	186	20N-11E-12	52	82	3624	0.83	Q	
			122	5440D	1.2		PN	474	29N-14E-11	52	115	6945	0.91	G	
			120	5360D	1.2		PN				140	6944D	1.27	G	
425	-30	55	119	6637	1.0		DE				90	6443D	0.6		DE
637	-30	55	121	6752	1.0		DE	321	29N-15E- 6	51	120	7000	0.99	M	
113	-36	55	136	6998	1.16	Ib		3-6	37N-14E-28	53	142	7208	1.2		C
			136	6300R	1.3		DE				140	6981	1.2		C
			142	6200R	1.4		DE	275	39N- 2E-32	47	87	3871	1.0		C
1-82	41N-31E- 7	56	71	466	3.2										
256	- 7	56	118	5690	1.1		PN	6	28N- 1W-35	49	128	3544	2.2		C
			123	5582D	1.2		PN				108	2106	2.8		PN
			122	5517D	1.2		PN								
			122	5431D	1.2		PN								
1-83	-18	56	80	421	5.7										
1-86	-19	55	80	684	3.7										
1-84	-19	55	80	693	3.6										
35	-19	55	120	5652	1.2		PN								
			129	5220R	1.4		PN								
			112	5049	1.1		PN								
191	42N-29E-33	55	115	5784	1.0		PN	<u>GRAHAM COUNTY</u>							
								620	5S-24E-16	62	119 ³	600			
								5-9	10S-28E-36	63	108 ⁴	1369			
								² Temperature of water flow, USGS WSP 1354 ³ Suspended geothermal test; temperature of water in hole ⁴ Oil test; artesian water temperature at surface							

O&GCC ID No.	Location T - R - S	Mean Annual Temperature (°F)	Temperature (°F)	Depth (Ft)	Temperature Gradient (°F/100 Ft)	Basement (Lithology)	Suprabasement (Geologic System)	O&GCC ID No.	Location T - R - S	Mean Annual Temperature (°F)	Temperature (°F)	Depth (Ft)	Temperature Gradient (°F/100 Ft)	Basement (Lithology)	Suprabasement (Geologic System)	
<u>MARICOPA COUNTY</u>																
627	2N- 1W- 2	70	129	3229	1.8		H-T	W177	36N-18E-20	50	110	5145	1.2		P	
			96	1627	1.6		H-T									
527	- 2	70	136	4475	1.5		H-T	283	38N-19E-24	51	125	7400	1.00	G		
7-15	3N- 1W-32	70	100	2003	1.5		CZ				132	7054D	1.1		C	
								281	38N-21E-29	50	125	7207	1.04	G		
7-24	1S- 6E-27	69	117	1940	2.5		T				120	7207D	0.97	G		
611	2S- 6E- 1	69	248	9126 ⁵	1.96		Ib-T				118	6779D	1.0		C	
			175	6944 ⁶	1.5		V-T				120	6776	1.0		C	
605	- 1	69	244	9074 ⁶	1.93	V					118	6670D	1.0		DE	
			147	4780T	1.6		T				120	6202D	1.1		DE	
			116	3115T	1.5		T	270	39N-21E-36	52	120	7178	0.95	Ir		
								13	42N-18E-34	49	118	4531	1.5		C	
											118	3426	2.0		P	
<u>MOHAVE COUNTY</u>								<u>PIMA COUNTY</u>								
542	26N-16W-22	65	168	5995T	1.7		H-T	597	16S-15E- 5	65	296	12568	1.84	Ia	T?	
			127	1770T	3.5		H-T				114	2968	1.7		T	
8-2	-28	66	122	2135	2.6		H-T	10-11	17S-10E-11	65	83	1344	1.3		?	
8-3	-30	67	119	2608	2.0		H-T	19	18S-18E-34	59	107	2547	1.9		K	
53	38N- 7W-17	56	80	1121	2.1		P									
347	39N- 7W- 2	55	107	4026	1.3		MI									
			104	3849	1.3		PN									
								<u>PINAL COUNTY</u>								
								11-21	1S-12E-33	68	128	4616	1.30	I		
								11-22	-34	67	162	5928	1.60	I		
								622	7S- 8E- 8	70	236	8004D	2.1		T ⁷	
											180	5843	1.9		T	
								11-12	-25	70	95	1931	1.3		CZ	

NAVAJO COUNTY

368	10N-21E-31	49	92	4038	1.06	G
374	12N-17E-18	48	66	1701	1.1	P
76	12N-23E-25	50	113	4498	1.40	M
			98	2048D	2.3	P
654	13N-18E- 8	50	93	3643	1.18	G
154	14N-18E-12	51	76	1945	1.29	P
291	14N-19E-35	51	88	3818	0.97	G
			86	3698	0.9	DE
660	14N-20E-29	52	95	3386	1.27	Ia
9-3	-33	51	118	3731	1.80	G
662	14N-21E-30	52	96	3786	1.16	G
658	14N-22E- 6	53	104	3630	1.41	Ia
20	16N-16E- 1	52	127	4190	1.79	G
86	16N-18E- 9	53	112	3925	1.50	G
			105	3687D	1.4	DE
			100	1883D	2.5	P
85	16N-20E- 5	53	107	4003	1.35	G
			110	3722D	1.5	DE
			110	1771D	3.2	P
329	16N-22E-16	54	87	3381	0.98	M?
217	17N-23E- 1	56	80	1282	1.9	P
89	18N-20E-30	55	95	1784	2.2	P
470	-31	55	86	1615	1.9	P
657	19N-17E-36	55	103	3804	1.26	M
181	19N-22E-13	56	95	1838	2.1	P
160	19N-23E- 9	55	75	1067	1.9	P
164	-16	55	73	846	2.1	TR
174	-26	55	75	729	2.7	P
162	-34	55	72	656	2.6	P
656	20N-15E-25	55	107	3795	1.37	M?
158	20N-21E-11	56	87	1715	1.8	P
307	26N-16E-15	55	106	5920	0.86	G
312	28N-15E- 9	53	122	6640	1.04	G
W123	28N-17E-26	51	80	979	2.9	TR
310	29N-19E- 8	50	120	7750	0.90	G
			98	3762D	1.3	TR
309	30N-17E-35	50	122	7783	0.93	G

583	8S- 8E- 2	70	228	10177	1.55	M ⁸
			230	10154	1.58	M
			156	8840D	1.0	T
			168	8710D	1.1	T
			117	2017	2.3	T

YAVAPAI COUNTY

495	18N- 5E-34	52	90	1195	3.18	G
479	-34	52	88	1138	3.16	G
589	10N-10W- 3	66	160	5676	1.66	G
533	- 3	66	125	3831	1.54	T

YUMA COUNTY

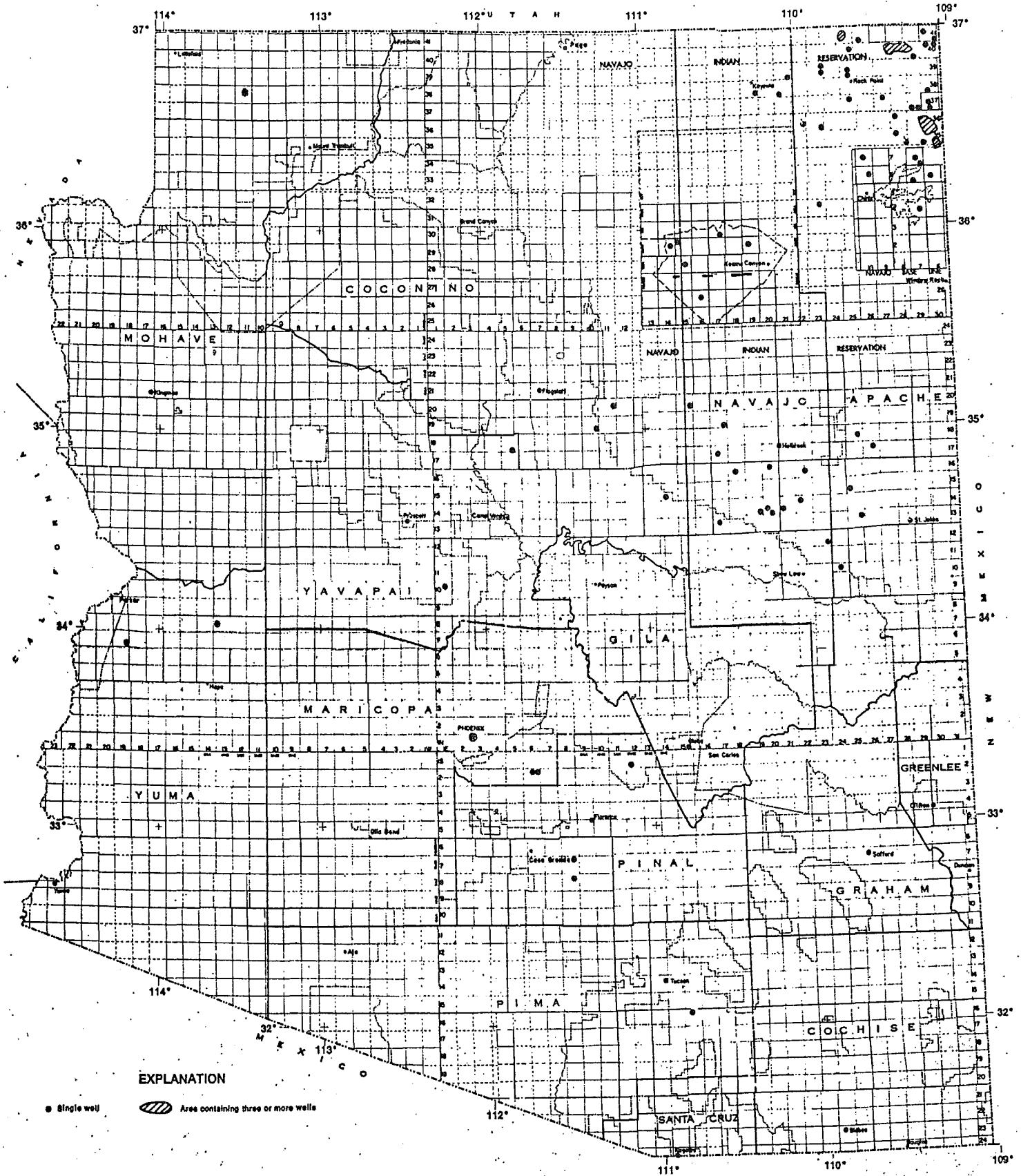
459	7N-19W-24	71	124	2500	2.12	I
457	8N-13W-20	68	81	1357	0.96	M
588	3S-11W-25	72	120	1314	3.7	V-T
156	7S-13W-16	73	135	5510	1.1	CZ
45	8S-22W-15	72	94	1872	1.2	CZ
14-12	-35	72	88	2001	0.8	CZ
14-13	9S-22W-28	72	96	2319	1.0	CZ
14-15	9S-24W- 8	73	77	2460	0.2	CZ
27	10S-24W-24	73	125	6015	0.9	CZ
14-18	10S-25W-35	74	100	2939	0.9	T?
604	11S-24W- 8	74	280	10555	2.0	V-T
			108	3098	1.1	CZ

⁵ Top of acidic igneous rock (basement?) at 10,440 ft.?

⁶ Top of basic igneous rock (basement?) at 9176 ft.?

⁷ Quartzite, schist, altered feldspar; loosely consolidated

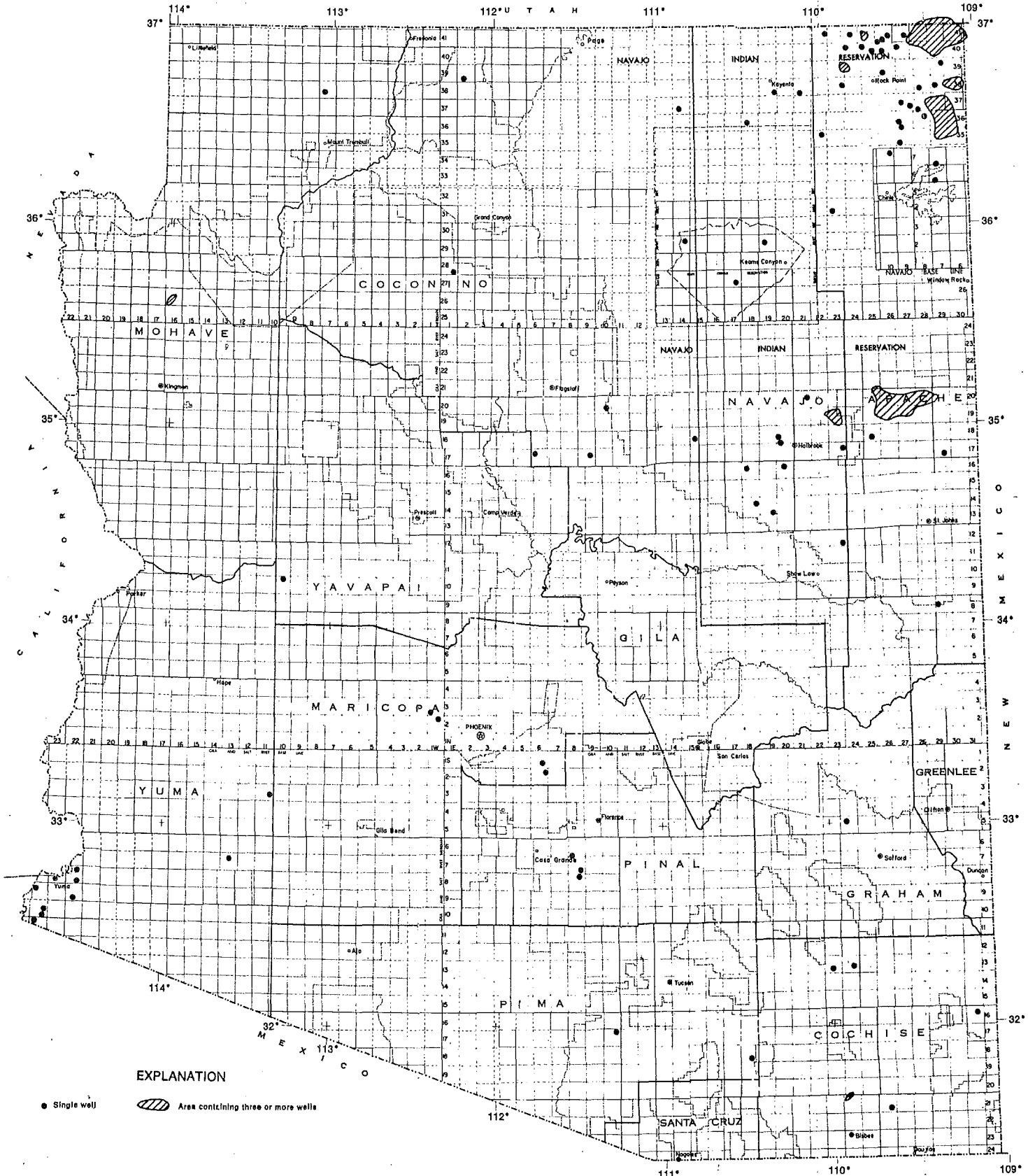
⁸ Metamorphosed granitic rock.



EXPLANATION

- Single well
- ▨ Area containing three or more wells

STATE OF ARIZONA
MAP SHOWING LOCATION OF WELLS PENETRATING
SUBSURFACE BASEMENT ROCKS
 JUNE 1977



EXPLANATION

- Single well
- ▨ Area containing three or more wells

STATE OF ARIZONA
 MAP SHOWING LOCATION OF WELLS PENETRATING
 SUBSURFACE SUPRABASEMENT ROCKS
 JUNE 1977

