Listing of gravity data in Utah Valley area, Utah

All of the stations listed on the following pages have been tied to the gravity base station network in Utah (Cook et al., 1967). Because the various surveys were conducted over several years and with different instruments, the accuracy of the various surveys will vary.

The following is a listing of the station prefixes used in this listing and the source of these gravity values. Where possible the estimated accuracy is also given.

Prefix	Taken by	Accuracy
W	Cook and Berg, 1961	0.5 mgal
DS	Don Selk, 1975	
JR	Montgomery, 1973	

STAT.	LATITUDE	LONGITUDE	ELEV.	OBSERVED GRAVITY	THEOR. GRAVITY	FREE AIR	SIMPLE BOUGUER	T.C.	COMPLETE BOUGUER
W0833	39.57.560	112. 6.110	6583.00	979595.84	980176.87	38.17	-186.11	1.89	-184.22
W0834	39.57.530	112. 4.200	6295.00	979614.78	980176.83	30.06	-184.40	1.83	-182.57
W0835	39.56.420	112. 4.740	6172.00	979617.93	980175.18	23.28	-186.99	3.29	-183.70
W0836	39.56.090	112. 3.880	5949.00	979630.47	980174.70	15.34	-187.34	2.28	-185.05
W0857	39.55.420	111.32.780	5399.00	979635.64	980173.70	-30.23	-214.17	5.10	-209.07
W0858	39.56.580	111.32.470	5329.00	979643.45	980175.41	-30.72	-212.27	5.17	-207.10
W0859	39.58.200	111.30.510	5170.00	979655.97	980177.81	-35.55	-211.69	5.81	-205.88
W0860	39.57.300	111.40.630	6205.00	979601.84	980176.49	8.99	-202.41	10.00	-192.41
W0861	39.56.520	111.40.430	6872.00	979565.44	980175.32	36.50	-197.62	4.48	-193.14
W0862	39.56.420	111.39.230	7522.00	979525.06	980175.18	57.40	-198.87	4.45	-194.42
W0863	39.55.460	111.37.900	8041.00	979486.21	980173.77	68.78	-205.17	5.04	-200.13
W0633	39.59.160	111.45.550	4824.00	979693.22	980179.24	-32.28	-196.63	5.52	-191.11
W0634	39.58.860	111.46.070	4899.00	979689.52	980178.79	-28.37	-195.27	4.06	-191.21
W0635	39.58.920	111.50.440	4626.00	979711.19	980178.88	-32.57	-190.17	1.33	-188.84
W0636	39.57.600	111.52.100	4518.00	979706.80	980176.93	-45.17	-199.09	1.36	-197.73
W0637	39.57.160	111.55.000	4549.00	979702.65	980176.27	-45.74	-200.72	.86	-199.86
W0638	39.57.120	111.56.990	4658.00	979692.71	980176.21	-45.37	-204.06	.77	-203.29
W0639	39.57.030	112. 1.070	5264.00	979669.79	980176.08	-11.16	-190.50	1.60	-188.90
W0640	39.57.040	112. 1.850	5399.00	979663.59	980176.09	-4.67	-188.61	1.68	-186.93
W0641	39.56.860	112. 2.820	5601.00	979654.26	980175.84	5.25	-185.57	1.75	-183.82
W0642	39.56.530	112. 3.360	5746.00	979644.77	980175.34	9.90	-185.86	2.07	-183.79
W0643	39.58.510	112. 3.680	5863.00	979644.49	980178.28	17.69	-182.06	1.99	-180.07
W0644	39.59.310	112. 2.170	5474.00	979657.85	980179.46	3.27	-183.22	2.76	-180.45
W0645	39.58.780	112. .040	5069.00	979684.72	980178.67	-17.16	-189.86	1.02	-188.84
W0646	39.58.980	111.59.330	4925.00	979686.67	980178.97	-29.05	-196.84	.85	-195.99
W0647	39.58.860	111.57.400	4672.00	979697.22	980178.79	-42.12	-201.29	.69	-200.60
W0648	39.58.900	111.55.380	4517.00	979702.09	980178.85	-51.89	-205.78	.70	-205.08
W0649	39.58.460	111.54.050	4526.00	979711.42	980178.21	-41.07	-195.27	.77	-194.50
W0742	39.56.380	111.58.090	4767.00	979686.31	980175.12	-40.42	-202.83	.83	-202.00
W0743	39.56.300	112. .500	5104.00	979676.50	980175.00	-18.42	-192.31	1.42	-190.89
W0744	39.56.310	112. 1.740	5452.00	979658.75	980175.02	-3.45	-189.19	1.67	-187.52
W0745	39.55.740	111.58.990	4797.00	979685.43	980174.17	-37.54	-200.97	1.06	-199.91
W0752	39.55.340	111.57.240	4638.00	979691.52	980173.58	-45.81	-203.82	1.08	-202.74

STAT.	LATITUDE	LONGITUDE	ELEV.	OBSERVED GRAVITY	THEOR. GRAVITY	FREE AIR	SIMPLE BOUGUER	T.C.	COMPLETE BOUGUER
W0775	39.55.400	111.54.950	4755.00	979692.46	980173.68	-33.96	-195.96	.99	-194.97
W0778	39.58.060	111.47.700	5005.00	979685.11	980177.61	-21.72	-192.24	2.26	-189.98
W0779	39.57.460	111.46.720	5175.00	979670.91	980176.72	-19.05	-195.36	4.25	-191.11
W0780	39.55.660	111.48.710	4973.00	979682.62	980174.05	-23.67	-193.10	3.85	-189.25
W0781	39.55.000	111.49.110	4960.00	979680.39	980173.08	-26.15	-195.13	3.73	-191.40
W0789	39.58.360	111.41.500	5604.00	979640.63	980178.05	-10.31	-201.23	10.33	-190.90
DZ 1	39.58.120	111.30.520	5171.00	979654.05	980177.70	-37.26	-213.43	5.73	-207.70
DZ 2	39.56.600	111.32.430	5329.00	979641.22	980175.45	-32.99	-214.54	5.16	-209.38
DZ 3	39.55.460	111.32.760	5400.00	979633.29	980173.77	-32.55	-216.52	5.06	-211.46
W0577	40. 3.890	111.43.900	4550.00	979703.62	980186.24	-54.65	-209.66	1.24	-208.42
W0578	40. 5.900	111.43.820	4528.00	979706.10	980189.21	-57.21	-211.47	.90	-210.57
W0579	40. 5.900	111.40.800	4592.00	979694.35	980189.21	-62.93	-219.38	1.31	-218.07
W0580	40. 6.030	111.39.280	4585.00	979698.57	980189.40	-59.56	-215.77	1.67	-214.10
W0582	40. 6.050	111.35.810	4745.00	979693.16	980189.43	-49.95	-211.61	3.57	-208.04
W0583	40. 5.620	111.35.230	4766.00	979692.54	980188.80	-47.98	-210.35	5.24	-205.11
W0584	40. 4.830	111.35.070	4837.00	979689.33	980187.62	-43.33	-208.12	6.90	-201.22
W0585	40. 3.380	111.33.670	4860.00	979676.90	980185.48	-51.45	-217.03	18.77	-198.26
W0586	40. 2.030	111.31.160	4932.00	979672.27	980183.48	-47.31	-215.34	8.40	-206.94
W0587	40. 1.630	111.30.220	4960.00	979675.65	980182.89	-40.71	-209.69	5.52	-204.17
W0588	40. 4.420	111.36.940	4713.00	979696.88	980187.02	-46.84	-207.41	7.26	-200.15
W0589	40. 4.270	111.38.080	4675.00	979695.39	980186.79	-51.67	-210.94	3.63	-207.31
W0590	40. 4.270	111.39.720	4612.00	979694.26	980186.79	-58.72	-215.85	2.22	-213.63
W0591	40. 3.430	111.40.340	4586.00	979694.88	980185.55	-59.32	-215.56	2.53	-213.03
W0592	40. 2.670	111.42.910	4598.00	979700.07	980184.43	-51.87	-208.52	1.92	-206.60
W0593	40. .710	111.44.670	4739.00	979694.73	980181.52	-41.04	-202.49	2.82	-199.67
W0594	40. 1.870	111.44.680	4648.00	979703.21	980183.23	-42.84	-201.19	1.78	-199.41
W0595	40. 2.570	111.44.360	4631.00	979702.17	980184.27	-46.52	-204.29	1.48	-202.81
W0596	40. 3.910	111.42.380	4528.00	979696.18	980186.27	-64.19	-218.45	1.59	-216.86
W0597	40. 1.180	111.42.230	4952.00	979685.24	980182.22	-31.19	-199.90	3.23	-196.67
W0598	40. 2.030	111.42.300	4693.00	979696.91	980183.48	-45.15	-205.04	2.60	-202.44
W0599	40. 2.240	111.41.480	4694.00	979695.79	980183.79	-46.48	-206.40	2.72	-203.68
W0600	40. 1.630	111.40.310	4952.00	979681.92	980182.89	-35.19	-203.90	3.91	-199.99
W0602	40. 2.430	111.39.480	4824.00	979688.20	980184.07	-42.12	-206.47	4.00	-202.47

STAT.	LATITUDE	LONGITUDE	ELEV.	OBSERVED GRAVITY	THEOR. GRAVITY	FREE AIR	SIMPLE BOUGUER	T.C.	COMPLETE BOUGUER
W0603	40. 2.870	111.38.340	4829.00	979688.61	980184.73	-41.90	-206.42	6.18	-200.24
W0604	40. 3.350	111.38.640	4701.00	979692.73	980185.44	-50.53	-210.69	4.32	-206.37
W0601	40. 1.640	111.39.460	5093.00	979672.42	980182.90	-31.43	-204.94	4.84	-200.10
W0605	40. .840	111.45.730	4655.00	979702.37	980181.72	-41.50	-200.09	2.11	-197.98
W0606	40. 4.220	111.46.120	4514.00	979716.93	980186.72	-45.20	-198.99	1.11	-197.88
W0607	40. 5.870	111.46.180	4498.00	979718.78	980189.17	-47.31	-200.55	.90	-199.65
W0611	40. 5.100	111.47.220	4514.00	979719.61	980188.03	-43.83	-197.62	1.41	-196.21
W0612	40. 3.330	111.47.190	4555.00	979716.79	980185.41	-40.18	-195.36	1.38	-193.98
W0613	40. 2.450	111.47.180	4599.00	979715.25	980184.09	-36.27	-192.95	1.32	-191.63
W0614	40. 2.450	111.48.000	4757.00	979708.67	980184.09	-27.98	-190.05	1.41	-188.64
W0615	40. 4.650	111.48.220	4734.00	979710.40	980187.36	-31.68	-192.96	3.80	-189.16
W0620	40. 5.220	111.51.600	4498.00	979727.92	980188.20	-37.20	-190.44	1.74	-188.70
W0621	40. 4.440	111.51.320	4498.00	979726.91	980187.05	-37.07	-190.31	4.85	-185.46
W0622	40. 3.060	111.51.880	4613.00	979717.69	980185.00	-33.41	-190.57	1.41	-189.16
W0623	40. 2.790	111.51.690	4598.00	979720.39	980184.61	-31.73	-188.38	1.54	-186.84
W0624	40. 2.400	111.51.410	4590.00	979720.59	980184.02	-31.69	-188.07	1.55	-186.52
W0625	40. 1.980	111.50.870	4581.00	979720.51	980183.40	-32.00	-188.07	1.73	-186.34
W0626	40. 1.530	111.50.570	4511.00	979721.49	980182.74	-36.95	-190.63	1.55	-189.08
W0627	40. .770	111.50.560	4518.00	979717.71	980181.60	-38.93	-192.85	1.13	-191.72
W0628	40. .220	111.51.130	4518.00	979718.27	980180.79	-37.56	-191.48	1.01	-190.47
W0629	40. .680	111.49.420	4618.00	979714.08	980181.48	-33.03	-190.36	1.33	-189.03
W0630	40. 1.960	111.48.870	5122.00	979687.92	980183.37	-13.67	-188.17	1.32	-186.85
W0631	40. 1.140	111.47.630	4761.00	979706.33	980182.16	-28.01	-190.21	1.30	-188.91
W0632	40. .700	111.47.140	4703.00	979706.96	980181.50	-32.17	-192.40	1.57	-190.83
W0679	40. 6.100	112. 5.690	4940.00	979720.01	980189.50	-4.83	-173.13	.48	-172.65
W0682	40. 5.510	112. 2.840	5038.00	979718.57	980188.63	3.81	-167.83	.48	-167.35
W0683	40. 5.370	112. 2.030	4989.00	979720.43	980188.42	1.27	-168.70	.63	-168.07
W0685	40. 5.860	112. .070	4799.00	979727.32	980189.16	-10.44	-173.94	.43	-173.51
W0686	40. 5.350	112. .650	4847.00	979726.42	980188.40	-6.07	-171.20	.61	-170.59
W0687	40. 4.670	112. .600	4881.00	979723.81	980187.39	-4.47	-170.76	.63	-170.13
W0688	40. 3.810	112. 2.270	5092.00	979704.85	980186.12	-2.32	-175.80	.71	-175.09
W0689	40. 3.330	112. 3.830	5175.00	979697.25	980185.41	-1.39	-177.70	1.13	-176.57
W0690	40. 2.550	112. 4.880	5292.00	979687.69	980184.24	1.21	-179.08	1.25	-177.83

STAT.	LATITUDE	LONGITUDE	ELEV.	OBSERVED GRAVITY	THEOR. GRAVITY	FREE AIR	SIMPLE BOUGUER	T.C.	COMPLETE BOUGUER
W0691	40. 2.470	112. 4.230	5322.00	979688.87	980184.12	5.33	-175.98	1.57	-174.41
W0692	40. 1.030	112. 3.920	5772.00	979657.36	980182.00	18.28	-178.37	1.87	-176.50
W0693	40. .680	112. 4.190	5725.00	979658.32	980181.48	15.34	-179.71	2.01	-177.70
W0694	40. .920	112. 5.340	5675.00	979664.13	980181.84	16.08	-177.26	2.18	-175.08
W0695	40. 2.150	112. 6.240	5662.00	979667.16	980183.66	16.07	-176.83	2.33	-174.50
W0696	40. 3.280	112. 5.560	5176.00	979693.05	980185.34	-5.43	-181.77	1.23	-180.54
W0697	40. 4.520	112. 5.860	5036.00	979705.17	980187.17	-8.32	-179.89	.89	-179.00
W0698	40. 5.340	112. 6.470	5016.00	979714.76	980188.38	-1.82	-172.71	.75	-171.96
W0699	40. 4.920	112. 3.380	5038.00	979713.39	980187.76	-.49	-172.13	.50	-171.63
W0700	40. 4.260	112. 3.440	5077.00	979706.94	980186.78	-2.30	-175.27	.64	-174.63
W0701	40. 3.270	112. .310	4975.00	979706.43	980185.32	-10.95	-180.44	.56	-179.88
W0702	40. 1.030	111.59.910	4993.00	979697.36	980182.00	-14.99	-185.10	.87	-184.23
W0776	39.59.680	111.47.130	4804.00	979700.02	980180.02	-28.13	-191.80	1.84	-189.96
W0777	39.59.840	111.47.980	4756.00	979698.81	980180.25	-34.09	-196.12	1.52	-194.60
W0788	39.59.880	111.42.060	5166.00	979671.01	980180.30	-23.38	-199.38	6.95	-192.43
W0425	40. 6.010	111.58.200	4618.00	979741.82	980189.37	-13.19	-170.52	.38	-170.14
W0426	40. 5.450	111.57.480	4583.00	979738.64	980188.54	-18.82	-174.96	.36	-174.60
W0427	40. 4.880	111.57.460	4597.00	979734.43	980187.70	-20.87	-177.49	.37	-177.12
W0428	40. 4.570	111.57.470	4601.00	979732.24	980187.24	-22.23	-178.98	.39	-178.59
W0429	40. 4.560	111.58.450	4686.00	979728.94	980187.23	-17.52	-177.17	.39	-176.78
W0430	40. 5.110	111.58.930	4693.00	979729.83	980188.05	-16.79	-176.68	.40	-176.28
W0431	40. 4.570	111.55.240	4494.00	979731.84	980187.24	-32.69	-185.80	.42	-185.38
W0432	40. 5.650	111.56.350	4519.00	979735.14	980188.85	-28.65	-182.61	.37	-182.24
W0435	40. 4.580	111.56.330	4535.00	979731.65	980187.26	-29.05	-183.55	.39	-183.16
W0436	40. 4.040	111.55.180	4496.00	979731.53	980186.46	-32.04	-185.21	.44	-184.77
W0437	40. 3.400	111.54.970	4505.00	979727.30	980185.51	-34.47	-187.95	.46	-187.49
W0438	40. 3.270	111.55.470	4503.00	979726.76	980185.32	-35.01	-188.42	.47	-187.95
W0439	40. 2.030	111.55.730	4498.00	979720.48	980183.48	-39.92	-193.16	.54	-192.62
W0440	40. 1.710	111.57.450	4614.00	979713.81	980183.00	-35.20	-192.39	.57	-191.82
W0441	40. .830	111.57.450	4645.00	979708.52	980181.70	-36.27	-194.52	.60	-193.92
W0442	40. 3.230	111.57.440	4627.00	979721.09	980185.27	-28.96	-186.60	.45	-186.15
DS228	40. 9.840	111.30.000	5101.00	979672.47	980195.05	-42.78	-216.57	9.43	-207.14
DS237	40.11.500	111.32.750	7118.00	979584.89	980197.52	56.89	-185.61	7.06	-178.55

STAT.	LATITUDE	LONGITUDE	ELEV.	OBSERVED GRAVITY	THEOR. GRAVITY	FREE AIR	SIMPLE BOUGUER	T.C.	COMPLETE BOUGUER
W0539	40.10.460	111.38.190	4505.00	979705.99	980195.98	-66.25	-219.73	2.99	-216.74
W0540	40.11.290	111.38.220	4495.00	979710.53	980197.21	-63.88	-217.02	3.86	-213.15
W0541	40.12.380	111.38.470	4496.00	979718.10	980198.83	-57.84	-211.01	4.60	-206.41
W0542	40.12.900	111.38.080	4536.00	979724.40	980199.59	-48.53	-203.07	6.67	-196.40
W0543	40.13.050	111.39.470	4491.00	979717.38	980199.80	-60.01	-213.01	3.33	-209.68
W0544	40.13.210	111.40.610	4508.00	979711.50	980200.04	-64.52	-218.10	2.19	-215.91
W0554	40.12.170	111.37.360	4554.00	979720.15	980198.51	-50.01	-205.16	9.34	-195.82
W0555	40.10.330	111.36.160	4564.00	979709.80	980195.78	-56.69	-212.18	6.32	-205.86
W0556	40.10.000	111.35.140	4672.00	979703.51	980195.29	-52.33	-211.50	8.60	-202.90
W0557	40. 9.670	111.35.180	4707.00	979700.45	980194.81	-51.62	-211.98	5.68	-206.30
W0558	40. 9.210	111.34.400	4763.00	979697.92	980194.12	-48.20	-210.47	5.45	-205.02
W0559	40. 9.070	111.33.130	4860.00	979692.82	980193.92	-43.97	-209.55	7.97	-201.58
W0560	40. 9.320	111.32.310	4935.00	979681.58	980194.28	-48.52	-216.65	13.52	-203.13
W0561	40. 9.830	111.30.000	5101.00	979672.56	980195.04	-42.67	-216.46	9.51	-206.95
W0562	40. 8.040	111.33.540	4849.00	979691.13	980192.39	-45.16	-210.36	6.27	-204.09
W0563	40. 7.810	111.34.890	4717.00	979695.30	980192.04	-53.06	-213.76	3.95	-209.81
W0564	40. 6.940	111.34.680	4748.00	979693.54	980190.76	-50.62	-212.38	5.09	-207.29
W0565	40. 6.930	111.35.830	4714.00	979692.50	980190.74	-54.84	-215.44	3.13	-212.31
W0566	40. 7.820	111.38.980	4539.00	979697.88	980192.05	-67.24	-221.88	1.64	-220.24
W0567	40. 7.820	111.41.310	4538.00	979696.28	980192.05	-68.94	-223.54	1.08	-222.46
W0568	40. 7.740	111.43.790	4511.00	979707.61	980191.94	-60.03	-213.71	.79	-212.92
W0569	40. 8.180	111.44.920	4494.00	979716.87	980192.59	-53.01	-206.12	.70	-205.42
W0570	40. 8.610	111.43.800	4501.00	979707.48	980193.23	-62.39	-215.73	.78	-214.95
W0571	40. 9.490	111.42.640	4498.00	979700.94	980194.53	-70.51	-223.75	.94	-222.81
W0572	40. 9.500	111.41.530	4506.00	979698.18	980194.55	-72.53	-226.05	1.12	-224.93
W0573	40. 9.500	111.40.390	4507.00	979697.65	980194.55	-72.97	-226.52	1.40	-225.12
W0574	40. 9.670	111.39.350	4502.00	979699.84	980194.81	-71.51	-224.89	1.81	-223.08
W0575	40.10.480	111.39.760	4492.00	979701.96	980196.00	-71.52	-224.56	1.87	-222.69
W0576	40. 8.010	111.37.130	4618.00	979695.76	980192.34	-62.22	-219.55	2.27	-217.28
W0581	40. 6.490	111.36.680	4729.00	979692.50	980190.09	-52.78	-213.89	2.63	-211.26
W0608	40. 6.830	111.46.090	4496.00	979720.99	980190.59	-46.71	-199.88	.76	-199.12
W0609	40. 8.150	111.46.660	4492.00	979726.48	980192.55	-43.55	-196.59	.63	-195.96
W0610	40. 6.840	111.47.780	4497.00	979730.45	980190.61	-37.17	-190.38	1.43	-188.95

STAT.	LATITUDE	LONGITUDE	ELEV.	OBSERVED GRAVITY	THEOR. GRAVITY	FREE AIR	SIMPLE BOUGUER	T.C.	COMPLETE BOUGUER
W0616	40. 7.930	111.48.750	4877.00	979712.52	980192.23	-20.97	-187.13	1.42	-185.71
W0617	40. 8.690	111.48.390	4526.00	979735.33	980193.35	-32.30	-186.50	.59	-185.91
W0618	40. 8.290	111.49.500	4511.00	979735.89	980192.75	-32.55	-186.24	.87	-185.37
W0619	40. 6.840	111.50.610	4624.00	979727.22	980190.61	-28.45	-185.99	2.10	-183.89
W0650	40. 7.980	112. 1.780	4893.00	979728.61	980192.30	-3.46	-170.16	.24	-169.92
W0651	40. 9.140	112. 1.910	4859.00	979718.09	980194.02	-18.90	-184.44	.21	-184.23
W0652	40. 9.550	112. .300	4927.00	979720.87	980194.63	-10.33	-178.19	.25	-177.94
W0653	40.10.870	112. .300	4878.00	979727.32	980196.59	-10.44	-176.63	.50	-176.13
W0654	40.12.070	112. .950	4839.00	979725.29	980198.37	-17.92	-182.78	.47	-182.31
W0655	40.12.850	112. .050	4860.00	979726.70	980199.52	-15.68	-181.26	.77	-180.49
W0657	40.13.080	112. 2.610	4831.00	979723.28	980199.85	-22.17	-186.76	.35	-186.41
W0659	40.11.330	112. 1.870	4840.00	979724.49	980197.27	-17.54	-182.43	.30	-182.13
W0660	40.10.170	112. 1.580	4856.00	979720.74	980195.55	-18.06	-183.50	.25	-183.25
W0661	40. 7.530	112. 1.500	4930.00	979726.61	980191.63	-1.31	-169.27	.24	-169.03
W0662	40. 7.590	112. 2.700	4895.00	979721.30	980191.72	-9.99	-176.76	.28	-176.48
W0663	40. 8.080	112. 4.370	4882.00	979720.54	980192.45	-12.71	-179.03	.31	-178.72
W0664	40. 8.680	112. 5.680	4882.00	979721.66	980193.34	-12.48	-178.80	.30	-178.50
W0665	40. 9.420	112. 5.670	4869.00	979719.96	980194.43	-16.49	-182.37	.29	-182.08
W0666	40.10.710	112. 5.660	4862.00	979722.11	980196.35	-16.93	-182.57	.33	-182.24
W0667	40.11.810	112. 5.660	4869.00	979721.81	980197.98	-18.20	-184.08	.35	-183.73
W0668	40.13.050	112. 5.650	4869.00	979722.74	980199.80	-19.09	-184.97	.40	-184.57
W0669	40.13.020	112. 4.230	4842.00	979724.37	980199.77	-19.96	-184.92	.34	-184.58
W0673	40.12.620	112. 6.010	4880.00	979722.84	980199.18	-17.32	-183.58	.42	-183.16
W0674	40.10.900	112. 6.590	4896.00	979727.42	980196.63	-8.70	-175.50	.51	-174.99
W0675	40.10.000	112. 6.930	4893.00	979727.23	980195.29	-7.82	-174.52	.53	-173.99
W0676	40. 9.290	112. 6.980	4906.00	979725.34	980194.24	-7.45	-174.59	.49	-174.10
W0677	40. 8.190	112. 6.890	4911.00	979725.47	980192.61	-5.21	-172.52	.43	-172.09
W0678	40. 6.360	112. 6.520	4981.00	979722.09	980189.90	.71	-168.99	.48	-168.51
W0680	40. 6.340	112. 4.620	4929.00	979719.02	980189.87	-7.22	-175.15	.39	-174.76
W0681	40. 6.700	112. 3.270	4944.00	979721.54	980190.41	-3.83	-172.27	.36	-171.91
W0684	40. 6.610	112. 1.460	4958.00	979722.70	980190.26	-1.21	-170.12	.32	-169.80
W0718	40.11.420	112. 4.160	5615.00	979688.78	980197.41	19.52	-171.78	9.54	-162.24
W0402	40.12.880	111.53.200	4728.00	979742.50	980199.56	-12.35	-173.43	1.56	-171.87

STAT.	LATITUDE	LONGITUDE	ELEV.	OBSERVED GRAVITY	THEOR. GRAVITY	FREE AIR	SIMPLE BOUGUER	T.C.	COMPLETE BOUGUER
W0404	40.11.450	111.53.920	4560.00	979749.65	980197.45	-18.88	-174.24	1.13	-173.11
W0405	40.11.080	111.54.560	4629.00	979744.26	980196.89	-17.22	-174.93	1.07	-173.86
W0406	40.10.250	111.56.050	4649.00	979742.00	980195.67	-16.38	-174.77	.73	-174.04
W0407	40.10.440	111.56.690	4765.00	979735.66	980195.95	-12.09	-174.43	.79	-173.64
W0408	40. 9.700	111.56.920	4648.00	979737.53	980194.85	-20.13	-178.48	.55	-177.93
W0409	40. 9.280	111.57.500	4667.00	979735.51	980194.23	-19.74	-178.74	.47	-178.27
W0410	40. 8.510	111.57.500	4643.00	979743.77	980193.09	-12.60	-170.78	.38	-170.40
W0411	40. 8.520	111.59.530	4811.00	979730.51	980193.10	-10.06	-173.97	.34	-173.63
W0412	40. 7.630	111.57.500	4561.00	979747.84	980191.77	-14.92	-170.31	.43	-169.88
W0413	40. 8.150	111.56.240	4493.00	979746.50	980192.55	-23.44	-176.51	.41	-176.10
W0414	40. 8.760	111.56.930	4574.00	979743.53	980193.45	-19.69	-175.52	.42	-175.10
W0415	40. 9.030	111.56.360	4543.00	979740.96	980193.86	-25.59	-180.36	.47	-179.89
W0416	40. 9.370	111.56.370	4575.00	979740.26	980194.36	-23.77	-179.64	.51	-179.13
W0424	40. 6.750	111.57.500	4558.00	979744.56	980190.48	-17.19	-172.48	.40	-172.08
W0433	40. 6.320	111.56.360	4512.00	979738.51	980189.84	-26.93	-180.65	.36	-180.29
W0434	40. 6.750	111.56.360	4501.00	979741.40	980190.48	-25.71	-179.06	.37	-178.69
JR18	40. 8.490	111.30.280	6187.00	979590.55	980193.06	-20.57	-231.35	4.02	-227.33
DS239	40.16.210	111.35.090	6950.00	979582.98	980204.48	32.21	-204.57	11.70	-192.87
DS238	40.17.500	111.36.230	7530.00	979550.34	980206.41	52.21	-204.33	12.08	-192.25
W0916	40.19.770	111.31.620	5858.00	979646.71	980209.77	-12.06	-211.64	9.01	-202.63
W0917	40.19.850	111.37.130	4997.00	979703.53	980209.89	-36.35	-206.59	18.04	-188.55
W0545	40.14.040	111.42.730	4496.00	979710.75	980201.28	-67.64	-220.81	1.38	-219.43
W0546	40.13.600	111.42.740	4493.00	979709.58	980200.62	-68.44	-221.51	1.32	-220.19
W0547	40.14.280	111.44.080	4490.00	979712.21	980201.63	-67.09	-220.06	1.07	-218.99
W0548	40.14.560	111.41.670	4528.00	979712.89	980202.04	-63.25	-217.51	1.87	-215.64
W0549	40.15.350	111.42.540	4530.00	979715.05	980203.22	-62.08	-216.41	1.62	-214.79
W0550	40.15.630	111.42.940	4524.00	979716.40	980203.62	-61.70	-215.83	1.54	-214.29
W0551	40.15.620	111.40.800	4704.00	979711.19	980203.61	-49.96	-210.22	2.56	-207.66
W0552	40.15.160	111.38.540	4706.00	979718.71	980202.94	-41.58	-201.91	6.65	-195.26
W0553	40.14.020	111.38.590	4545.00	979723.32	980201.25	-50.43	-205.27	6.06	-199.21
W0656	40.14.240	111.59.720	4867.00	979726.95	980201.57	-16.83	-182.64	1.32	-181.32
W0658	40.13.760	112. 2.730	4844.00	979722.53	980200.86	-22.60	-187.63	.37	-187.26
W0670	40.14.500	112. 3.860	4854.00	979726.29	980201.95	-19.10	-184.47	.41	-184.06

STAT.	LATITUDE	LONGITUDE	ELEV.	OBSERVED GRAVITY	THEOR. GRAVITY	FREE AIR	SIMPLE BOUGUER	T.C.	COMPLETE BOUGUER
W0672	40.14.380	112. 6.050	4907.00	979725.94	980201.77	-14.28	-181.46	.51	-180.95
W0734	40.19.930	111.59.670	5006.00	979728.70	980210.01	-10.44	-180.99	.86	-180.13
W0735	40.18.980	111.59.570	4935.00	979730.69	980208.61	-13.73	-181.86	1.10	-180.76
W0736	40.18.110	111.59.540	4892.00	979734.27	980207.31	-12.90	-179.57	1.49	-178.08
W0737	40.17.390	111.59.510	4899.00	979735.04	980206.25	-10.41	-177.31	1.59	-175.72
W0738	40.16.380	111.59.590	4868.00	979734.51	980204.75	-12.35	-178.20	1.68	-176.52
W0739	40.15.680	111.59.600	4845.00	979733.11	980203.71	-14.88	-179.94	1.78	-178.16
W0358	40.19.640	111.45.550	4506.00	979720.77	980209.59	-64.98	-218.50	1.69	-216.81
W0359	40.20.010	111.44.280	4541.00	979725.20	980210.14	-57.81	-212.52	2.44	-210.08
W0360	40.20.020	111.43.440	4640.00	979723.15	980210.16	-50.57	-208.65	2.84	-205.81
W0361	40.20.020	111.42.760	4739.00	979720.73	980210.16	-43.68	-205.13	3.25	-201.88
W0362	40.20.020	111.41.630	4854.00	979719.72	980210.16	-33.87	-199.24	4.46	-194.78
W0363	40.20.100	111.40.870	5097.00	979707.82	980210.27	-23.03	-196.68	5.62	-191.06
W0364	40.18.260	111.42.270	4749.00	979716.79	980207.53	-44.05	-205.84	2.34	-203.50
W0365	40.18.260	111.43.410	4624.00	979720.99	980207.53	-51.61	-209.14	1.89	-207.25
W0366	40.17.390	111.43.400	4584.00	979721.05	980206.25	-54.03	-210.20	1.66	-208.54
W0367	40.17.170	111.44.330	4527.00	979721.72	980205.91	-58.38	-212.61	1.38	-211.23
W0368	40.17.380	111.45.130	4506.00	979720.97	980206.23	-61.43	-214.94	1.23	-213.71
W0369	40.17.830	111.44.750	4522.00	979722.50	980206.89	-59.05	-213.11	1.41	-211.70
W0370	40.17.820	111.45.510	4508.00	979720.86	980206.87	-62.00	-215.58	1.23	-214.35
W0371	40.18.230	111.45.640	4506.00	979720.72	980207.48	-62.93	-216.44	1.29	-215.15
W0372	40.19.000	111.45.810	4506.00	979720.36	980208.64	-64.44	-217.96	1.41	-216.55
W0373	40.16.850	111.43.820	4531.00	979720.82	980205.45	-58.44	-212.81	1.45	-211.36
W0374	40.16.520	111.43.600	4534.00	979719.68	980204.95	-58.80	-213.27	1.45	-211.82
W0375	40.16.520	111.42.810	4585.00	979719.36	980204.95	-55.32	-211.53	1.68	-209.85
W0376	40.16.510	111.42.230	4712.00	979711.59	980204.94	-50.14	-210.67	1.98	-208.69
W0377	40.17.400	111.42.250	4747.00	979713.87	980206.27	-45.89	-207.62	2.22	-205.40
W0378	40.18.270	111.40.540	4826.00	979718.66	980207.55	-34.95	-199.37	3.36	-196.01
W0379	40.18.930	111.39.220	4828.00	979724.70	980208.54	-29.71	-194.20	6.77	-187.43
W0380	40.19.270	111.38.910	4850.00	979722.72	980209.03	-30.12	-195.35	8.73	-186.62
W0381	40.17.870	111.39.180	4838.00	979720.00	980206.96	-31.89	-196.72	5.52	-191.20
W0382	40.17.020	111.39.070	4783.00	979718.69	980205.70	-37.12	-200.07	5.51	-194.56
W0383	40.16.100	111.38.510	4840.00	979713.61	980204.33	-35.47	-200.36	6.76	-193.60

STAT.	LATITUDE	LONGITUDE	ELEV.	OBSERVED GRAVITY	THEOR. GRAVITY	FREE AIR	SIMPLE BOUGUER	T.C.	COMPLETE BOUGUER
W0384	40.16.970	111.39.510	4691.00	979723.12	980205.62	-41.27	-201.09	4.63	-196.46
W0385	40.17.340	111.39.470	4721.00	979723.84	980206.18	-38.28	-199.12	4.84	-194.28
W0386	40.18.050	111.39.770	4760.00	979724.19	980207.23	-35.31	-197.48	4.48	-193.00
W0387	40.16.960	111.40.070	4699.00	979721.28	980205.61	-42.34	-202.43	3.58	-198.85
W0388	40.17.380	111.40.520	4787.00	979716.49	980206.23	-39.48	-202.57	3.02	-199.55
W0389	40.17.380	111.41.460	4761.00	979715.48	980206.23	-42.94	-205.14	2.37	-202.77
W0390	40.16.940	111.41.260	4756.00	979714.56	980205.58	-43.67	-205.70	2.40	-203.30
W0391	40.18.980	111.53.660	4590.00	979751.27	980208.61	-25.60	-181.98	1.45	-180.53
W0392	40.17.470	111.52.690	4594.00	979750.61	980206.37	-23.65	-180.16	1.62	-178.54
W0393	40.15.720	111.52.720	4807.00	979739.25	980203.77	-12.38	-176.15	2.43	-173.72
W0394	40.15.100	111.52.680	5085.00	979722.20	980202.84	-2.34	-175.58	2.16	-173.42
W0395	40.14.910	111.52.770	5150.00	979717.81	980202.56	-.34	-175.80	2.54	-173.26
W0396	40.16.050	111.53.980	5445.00	979699.83	980204.25	7.74	-177.77	3.69	-174.08
W0397	40.16.510	111.53.120	4884.00	979734.13	980204.94	-11.42	-177.81	2.16	-175.65
W0398	40.15.930	111.51.220	4502.00	979750.03	980204.08	-30.59	-183.97	1.12	-182.85
W0399	40.15.780	111.51.980	4620.00	979747.65	980203.86	-21.65	-179.05	1.66	-177.39
W0400	40.14.780	111.52.000	4628.00	979746.39	980202.37	-20.68	-178.35	2.65	-175.70
W0401	40.13.440	111.52.570	4647.00	979747.21	980200.37	-16.07	-174.39	1.65	-172.74
W0403	40.13.290	111.53.630	4944.00	979728.96	980200.16	-6.16	-174.60	2.18	-172.42
W0419	40.19.970	111.54.670	4555.00	979755.33	980210.07	-26.30	-181.48	1.40	-180.08
W0420	40.19.780	111.54.450	4593.00	979752.55	980209.79	-25.22	-181.70	1.30	-180.40
W0421	40.19.130	111.55.930	5124.00	979722.36	980208.83	-4.50	-179.07	2.32	-176.75
W0422	40.18.510	111.55.060	5135.00	979719.66	980207.91	-5.26	-180.20	2.80	-177.40
W0423	40.17.280	111.53.420	4882.00	979733.96	980206.08	-12.91	-179.24	2.20	-177.04
W0456	40.16.600	112. 7.280	5121.00	979722.80	980205.07	-.59	-175.06	1.30	-173.76
W0464	40.18.860	112. 7.250	5487.00	979698.38	980208.42	6.07	-180.87	2.70	-178.17
W0465	40.15.660	112. 5.560	4876.00	979730.44	980203.67	-14.60	-180.72	.66	-180.06
W0468	40.16.360	112. 4.660	4860.00	979725.04	980204.72	-22.55	-188.12	.70	-187.42
W0469	40.17.840	112. 3.010	4858.00	979726.54	980206.91	-23.42	-188.93	.75	-188.18
W0470	40.18.520	112. 2.300	4864.00	979731.24	980207.92	-19.18	-184.89	.81	-184.08
W0471	40.19.260	112. 1.620	4887.00	979732.25	980209.02	-17.10	-183.59	.80	-182.79
W0904	40.21.880	111.33.340	5218.00	979689.37	980212.91	-32.73	-210.50	17.92	-192.58
W0913	40.21.380	111.34.380	5196.00	979690.87	980212.16	-32.56	-209.58	16.20	-193.38

STAT.	LATITUDE	LONGITUDE	ELEV.	OBSERVED GRAVITY	THEOR. GRAVITY	FREE AIR	SIMPLE BOUGUER	T.C.	COMPLETE BOUGUER
W0914	40.20.890	111.32.690	5465.00	979670.90	980211.44	-26.50	-212.69	14.86	-197.83
W0915	40.20.140	111.31.350	5675.00	979655.97	980210.33	-20.57	-213.91	11.38	-202.53
W0324	40.21.670	111.43.100	4780.00	979724.56	980212.60	-38.43	-201.28	5.50	-195.78
W0323	40.21.840	111.44.280	4623.00	979731.09	980212.85	-46.92	-204.42	3.95	-200.47
W0325	40.21.670	111.42.310	5062.00	979709.86	980212.60	-26.61	-199.07	7.22	-191.85
W0333	40.22.160	111.54.930	4522.00	979755.50	980213.34	-32.40	-186.46	.94	-185.52
W0334	40.22.150	111.56.080	4609.00	979752.79	980213.32	-27.01	-184.03	.95	-183.08
W0335	40.21.810	111.56.900	4774.00	979743.56	980212.80	-20.11	-182.75	.79	-181.96
W0336	40.21.740	111.59.020	4885.00	979738.90	980212.70	-14.32	-180.75	.84	-179.91
W0337	40.21.290	111.54.930	4543.00	979755.24	980212.04	-29.48	-184.26	.90	-183.36
W0338	40.21.290	111.54.060	4499.00	979756.07	980212.04	-32.79	-186.07	.88	-185.19
W0339	40.21.600	111.53.750	4493.00	979753.28	980212.50	-36.61	-189.68	.87	-188.81
W0340	40.21.740	111.53.220	4493.00	979747.88	980212.70	-42.21	-195.28	.86	-194.42
W0341	40.21.900	111.53.150	4494.00	979746.59	980212.94	-43.64	-196.75	.87	-195.88
W0342	40.22.200	111.48.030	4567.00	979723.21	980213.39	-60.61	-216.20	1.54	-214.66
W0343	40.21.150	111.48.770	4492.00	979721.92	980211.83	-67.39	-220.43	1.20	-219.23
W0344	40.21.910	111.49.820	4498.00	979726.19	980212.95	-63.68	-216.92	1.14	-215.78
W0345	40.22.110	111.50.620	4496.00	979729.39	980213.24	-60.96	-214.13	1.05	-213.08
W0346	40.21.880	111.50.910	4493.00	979730.25	980212.91	-60.05	-213.12	.99	-212.13
W0347	40.21.900	111.51.400	4497.00	979732.40	980212.94	-57.55	-210.76	.95	-209.81
W0348	40.21.620	111.51.740	4490.00	979734.90	980212.53	-55.30	-208.27	.91	-207.36
W0349	40.21.900	111.51.980	4498.00	979735.74	980212.94	-54.12	-207.36	.91	-206.45
W0350	40.20.760	111.48.230	4491.00	979719.53	980211.25	-69.30	-222.30	1.23	-221.07
W0351	40.20.600	111.48.050	4490.00	979718.75	980211.02	-69.94	-222.91	1.24	-221.67
W0352	40.20.860	111.47.660	4498.00	979719.27	980211.39	-69.04	-222.28	1.38	-220.90
W0353	40.20.860	111.47.080	4501.00	979719.56	980211.39	-68.47	-221.81	1.56	-220.25
W0354	40.21.320	111.46.390	4523.00	979722.06	980212.08	-64.59	-218.68	1.95	-216.73
W0355	40.21.320	111.47.090	4523.00	979720.76	980212.08	-65.89	-219.98	1.67	-218.31
W0356	40.20.870	111.46.410	4505.00	979720.10	980211.41	-67.57	-221.05	1.79	-219.26
W0357	40.20.650	111.45.530	4501.00	979721.66	980211.09	-66.06	-219.41	2.13	-217.28
W0417	40.20.850	111.54.930	4549.00	979755.16	980211.38	-28.34	-183.32	.98	-182.34
W0418	40.20.220	111.54.900	4559.00	979755.15	980210.45	-26.48	-181.80	1.23	-180.57
W0444	40.21.420	112. 3.450	5108.00	979721.96	980212.23	-9.81	-183.83	1.11	-182.72

STAT.	LATITUDE	LONGITUDE	ELEV.	OBSERVED GRAVITY	THEOR. GRAVITY	FREE AIR	SIMPLE BOUGUER	T.C.	COMPLETE BOUGUER
W0461	40.20.880	112. 4.690	5093.00	979725.18	980211.42	-7.20	-180.71	1.60	-179.11
W0463	40.20.900	112. 5.740	5255.00	979712.79	980211.45	-4.38	-183.41	2.40	-181.01

UGMS
WASATCH CO.

	SEC	T.	R.	DEPTH	°F	
✓1	32	3S	9W	8396	107	✓
✓2	34	4S	11W	3499	126	✓ ✓ 23.7°F/1000
				3985	108	✓ 43°
				6682	152	✓
				9997	191	✓
				10015	191	✓
✓3	26SE	5S	10W	531	67	45.2°F/1000
				4501	114	✓
				5602	138	✓
✓4	9	6S	9W	6501	138	✓
(5)	7	9S	6E	4007	136	DOES NOT PLOT IN WASATCH
				8214	168	
✓5	13SE	2S	10W	9997	110	✓
6	18	5S	11W	6054	110	✓

plotted

ambient 43°F
on all

WASATCH CO.

P. I.	UGMS	
53 ○	1 ○	
61 ○	2 ○	43.2 °C/km
	3 ▲	82.4 °C/km
	4 ○	
	5 ○	
	6 ○	

METRIC
ANOM. WELLS IN WASATCH

Sec	T	R	d (meters)	°C	°C/km	Amb.
34	4S	11W	1066	52.2	43	6.1
26	5S	10W	162	19.4	82	6.1

Total wells 8

Total Ambient 2

THERMAL SPRINGS NEAR MIDWAY, UTAH

By C. H. BAKER, JR., Salt Lake City, Utah

Work done in cooperation with the Utah Department of Natural Resources, Division of Water Rights

Abstract.—A group of thermal springs near Midway, Utah, is surrounded by a deposit of calcareous tufa that covers an area of about 4.5 square miles and locally is at least 70 feet thick. The springs include both flowing thermal springs and hot pots, which are small pools of warm water occupying shallow craters in the tops of conical or hemispherical mounds of tufa. Extinct hot pots (dry craters) and solid mounds of tufa as much as 10 feet high are also common. The water from the flowing springs and hot pots is not highly mineralized (the total dissolved solids rarely exceeds 2,000 mg/l), but it is saturated with respect to calcium carbonate. The spring water is of meteoric origin; it enters the carbonate bedrock in the nearby Wasatch Range and moves rapidly through fractures and solution openings. The geothermal gradient in the vicinity of Midway is abnormally high, but the reasons for the high heat flux are not known.

A group of thermal springs in western Wasatch County, Utah, presents some unusual geohydrologic features. The springs, known locally as the hot pots, are in secs. 26, 27, and 34, T. 3 S., R. 4 E., Salt Lake base line and meridian. The spring area surrounds the town of Midway on the west side of Heber Valley, one of a line of small valleys on the east flank of the Wasatch Range (fig. 1). The hot pots are surrounded by a deposit of calcareous tufa that covers an area of about 4.5 square miles and locally is at least 70 feet thick. The tufa deposit forms a low terrace that is underlain by alluvium; water apparently rises through the alluvium from a bedrock source.

The warm water and the unusual form of many of the springs attracted the attention of the earliest settlers in the area, and the water has been used by bathing resorts for many years. The fame of the hot pots is largely local, however, and no detailed hydrologic studies have been made in the area.

The hot pots were described briefly by Howell (1875, p. 256–257), who saw them in 1872. Emmons (Hague and Emmons, 1877, p. 317–319) called the hot pots "* * * a group of warm springs, the most important and considerable observed in this region * * *" and gave a general description of them, including a chemical analysis of a sample of tufa. Neither of these early observers offered any explanation of the source of the hot water. Heylmun (1966, p. 15) included the hot pots in a listing of thermal springs in Utah, and suggested that the source of the heat was "volcanic or tectonic." Milligan, Marsell, and Bagley (1966, p. 36)

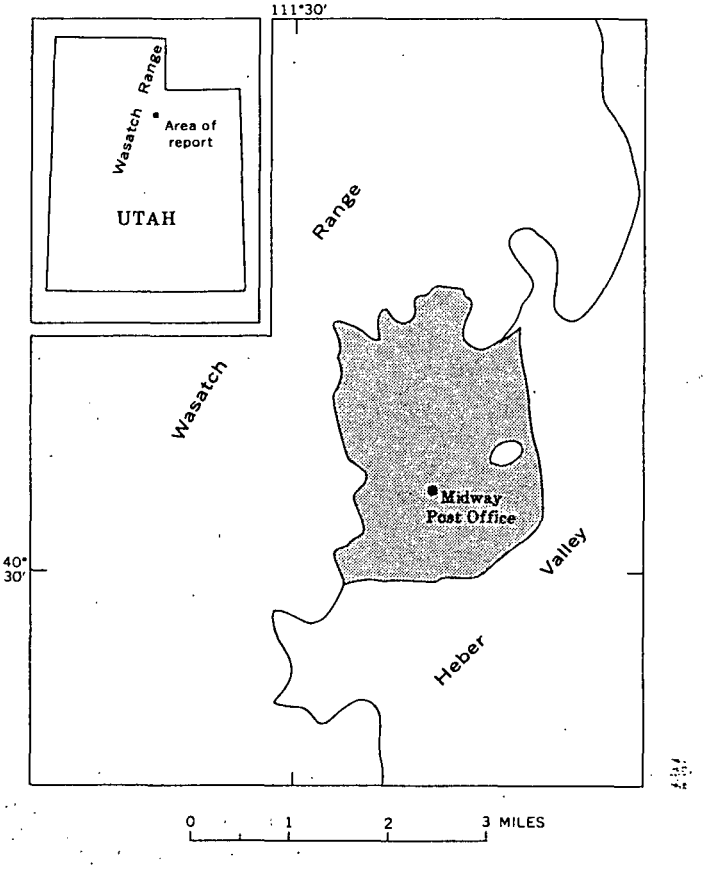

FIGURE 1.—Location of the area of thermal springs (shaded) near Midway, Utah.

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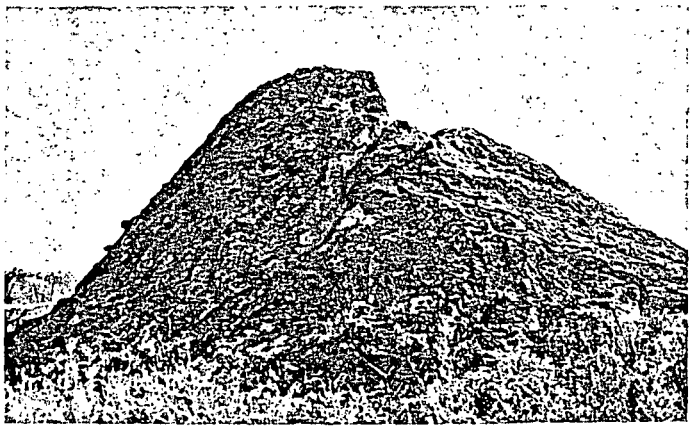

FIGURE 4.—Typical solid mound of tufa. Top is about 10 feet above ground level in foreground.

(about 6°C, or ≈43°F). The temperature of the water varies considerably from pot to pot, although within a single pot there is little variation from top to bottom. Water temperatures in the pots range from 12° to 40°C (≈54°–≈104°F), and pots a few tens of feet apart may have temperatures differing by as much as 17°C (≈30°F). The two pots that overflow have water temperatures of 32–34°C (≈89°–≈94°F) when they are flowing, but the temperatures drop as low as 30°C (≈86°F) during the periods of no flow. Water is withdrawn from four pots at bathing resorts; three of the pots have water temperatures of 40°C (≈104°F), the fourth has a temperature of 38°C (≈100°F). Water temperatures of the seven flowing springs range from 30° to 46°C (≈86°–≈114°F).

The altitude of the water surface, like the water temperature, is not uniform in the various pots, and some of the flowing springs are above some of the pots that do not flow (see figs. 5 and 6). Water levels within each cluster of pots are apparently independent of each other; one of the pots that occasionally overflows has a water surface as much as 8 feet above that of some of its nonflowing neighbors less than 100 feet away.

An automatic water-level recorder was installed on one of the nonflowing pots (location C–1, fig. 6*B*) in October 1966, and a thermograph was installed in May 1967. The thermograph was operated through October 1967 and the water-level recorder through September 1968. The record shows four kinds of water-level fluctuations. Slow seasonal changes of 2 or 3 feet undoubtedly represent changes in storage within the aquifer. The abrupt rises of 1 foot or more that occur during the spring and summer may result from pressure waves caused by addition of slugs of water (recharge) to the aquifer (see fig. 7). The small changes occurring during the autumn within a period of a few days correlate closely with changes in barometric pressure. Finally, the very small fluctuations, which occur daily and last for a few hours, seem to be related to circulation within the pot caused by cooling at the surface. No long-term temperature changes were recorded.

The hot pots support an abundant and varied biota. Algae, probably of several species, are plentiful in and around most of the hot pots and flowing thermal springs; and it is likely that some algae may be involved in the deposition of tufa. Numerous small (5–10 millimeters) crustaceans were collected by the author from many of the hot pots, and specimens were identified by Dr. S. B. Mulaik of the University of Utah as the amphipod *Hyalella azteca*, which is common in streams and ponds of the region. Microscopic life forms are also present, including probable diatoms and forms believed to be ostracods; but none of these was identified. The question of whether there are any life forms unique to the hot pots in this region would require detailed biologic study.

QUALITY OF THE WATER

Although the stagnant water in the nonflowing hot pots is opaque and murky green, brown, or black, water from the flowing springs, the occasional overflow from the two pots mentioned, and the water withdrawn from otherwise stagnant pots by the resorts are clear and colorless. Bubbles of odorless gas, possibly carbon dioxide, continually rise to the surface in most of the pots, and the gurgling noise from the flowing springs suggests that they too are giving off considerable quantities of gas.

Chemical analyses of water from several of the hot pots and flowing springs are shown in table 1. The water is not highly mineralized, but it is much more mineralized than other ground water in the area. The concentration of dissolved solids in six samples ranges from 1,710 to 2,040 milligrams per liter. The concentration of dissolved solids in water from wells and springs in the alluvium rarely exceeds 1,000 mg/l, and springs less than 1 mile from the hot pots yield cold water, from bedrock sources, having concentrations of dissolved solids of less than 500 mg/l.

Water from the hot pots and related thermal springs is unstable in the air at normal temperatures. When the water is exposed to the air, carbon dioxide escapes, the pH of the water increases, and calcium carbonate is precipitated. This fact is well illustrated by the changes that took place in a sample that was collected and stored. A sample of water was dipped from the surface in one of the hot pots (location C–3, fig. 6*B*) on October 17, 1967. The pH of the water was measured in the field, and the sample was filtered to remove any suspended sediment. An aliquot of the filtered sample was

TABLE 1.—*Chemical analyses of water from hot pots and flowing thermal springs near Midway, Utah*

[Concentrations of dissolved constituents, dissolved solids, and hardness given in milligrams per liter. pH values in parentheses are calculated equilibrium values; see text for explanation]

Location number in figures 5 or 6	Date of collection	Temperature (° C)	Silica (SiO_2)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$	Noncarbonate hardness as $CaCO_3$	Specific conductance (micromhos/cm at 25°C)	pH	Point of collection
Typical hot pot																				
C–1	9–28–66	29	21	353	72	125	28	716	0	702	115	2.1	0.1	0.70	1,840	1,180	589	2,330	7.4 (6.4)	Surface.
C–2	9–28–66	30	19	329	70	111	25	686	0	643	103	2.2	.1	.64	1,710	1,110	545	2,180	7.7 (6.5)	Do.
	[1] 10–17–67	34	------	315	68	----------		680	----------									2,150	6.8	Do.
	[1] 10–17–67	34	------	313	68	----------		676	----------									2,150	6.8	Depth of 20 ft.
C–3	5–15–67	28	21	329	88	163	33	584	0	805	150	2.7	0	.80	1,980	1,180	701	2,610	7.7 (6.5)	Surface.
	[1] 10–17–67	32	------	394	76	----------		780	----------									2,500	6.8	Overflow.
	[1] 10–17–67	32	------	387	76	----------		770	----------									2,600	6.8	Depth of 23 ft.
C–6 [2]	9–28–66	40	23	331	68	114	25	674	0	661	108	2.2	.1	.67	1,730	1,110	553	2,200	7.3 (6.5)	End of pipe.
Flowing thermal spring																				
C–4 [3]	9–28–66	40	28	389	73	151	31	728	0	820	138	2.5	0.1	0.79	2,040	1,270	673	2,560	7.3 (6.4)	Discharge point.
C–5 [4]	9–13–67	46	27	345	83	148	16	644	0	742	132	2.5	.4	.64	1,910	1,200	672	2,410	7.5 (6.4)	Do.

[1] Determinations for bicarbonate, specific conductance, and pH are field determinations; calcium and magnesium concentrations were determined in the laboratory on samples acidified at the time of collection.
[2] Hot pot tapped by pipe driven into side of mound; discharge about 50 gpm.
[3] Discharge about 150 gpm.
[4] Discharge about 1,300 gpm.

librium with calcite was calculated according to a method described by Hem (1961). The calculated equilibrium pH of all the samples was either 6.4 or 6.5 as compared to values of 7.3–7.7 measured in the laboratory and the value of 6.8 obtained in the field. The values for calculated pH at equilibrium with calcite are designated by footnote 1 in table 1.

From the foregoing, it can be seen that the hot pots, although not very active at present, are by no means extinct. Tufa is still being deposited around the orifices of the flowing springs and within the craters of the nonflowing hot pots.

TUFA DEPOSITS

The tufa that surrounds the spring area and forms the characteristic mounds around the typical hot pots is soft, porous, massive, buff to tan, and weathers to a dirty gray. When samples of the tufa were digested in dilute hydrochloric acid, 98 percent of the material was soluble. The insoluble residue consisted of about equal parts of silt-size quartz grains and organic material. The calcium-magnesium ratios of the tufa samples ranged from 106:1 to 140:1. The tufa is, therefore, nearly pure calcium carbonate, and has only traces of magnesium and a little insoluble debris. Fine concentric banding is visible on some polished surfaces of tufa; the shape of some of the banding and the presence of organic material in the residue suggest that algae may have been involved in at least some of the deposition.

Locally, at least, the tufa is moderately permeable; two shallow dug wells are known to obtain water from the tufa. The water from these wells is only weakly thermal; the temperature is about 12° C (≈53° F). A sample from one well contained 661 mg/l of dissolved solids—a much lower concentration than that of the thermal water.

Two drilled wells obtain water from gravel overlain by tufa. The locations of these two wells are shown in figure 5, and the drillers' logs of the wells are as follows:

Well (D–4–4)2cba–1

Material	Depth (feet)
Soil	2
Potrock (tufa)	38
Clay, sand, gravel, and boulders	78
Potrock (tufa)	84
Sand and gravel	87
Hardpan (tufa?)	98
Clay	105

Well (D–3–4)35dab–1

Material	Depth (feet)
Soil	5
Tufa	70
Gravel	86
Limestone (tufa?)	92
Sand and gravel	94

The fact that both these logs show a layer of tufa (potrock, limestone) at depth, overlain by alluvium, strongly suggests that the hot pots have been alternately active and dormant through at least two cycles of activity. Unfortunately, no information is available from greater depths to show whether other layers of tufa are also present.

GEOLOGIC RELATIONS

A geologic map of the area surrounding the hot pots (part of which is reproduced in fig. 5) was prepared by Bromfield, Baker, and Crittenden (1967). The geology of this part of the Wasatch Range is extremely complex, but the map does provide a basis for some speculation about the aquifer system that supplies water to the hot pots. Carbonate rocks of Mississippian and Pennsylvanian age crop out extensively in the high mountains north and west of Midway and are overlain by younger (Triassic) sedimentary rocks of low permeability. The sedimentary rocks dip steeply toward the valley. An intrusive body of Tertiary age crops out a short distance north of Midway, and the sedimentary rocks surrounding the intrusive are intensely fractured and faulted. According to C. S. Bromfield (oral commun., 1966), magnetic anomalies near Midway suggest that the intrusive body extends southeastward under the area of hot pots. If this is so, the fracturing of the sedimentary rocks in the vicinity of the intrusive body would provide the necessary break in the impermeable confining layers to permit water that is under artesian pressure in the carbonate rocks to escape to the surface.

The source of the heat is a more difficult question. The age of the intrusive body (30–35 million years according to Bromfield's data) seems to exclude it from consideration as a source of heat, and there is no evidence of more recent magmatic activity in the area. Mine operators a few miles north of Midway, however, report higher temperatures and flows of hot water in tunnels that approach or penetrate the intrusive rocks, indicating a higher-than-normal geothermal gradient. The causes of the abnormally high geothermal gradient are unknown.

INFERRED ORIGIN

The following theory of the origin and continued existence of the hot pots is proposed. Meteoric water enters the carbonate rocks in the Wasatch Range, descends along fractures and solution openings, and dissolves minerals from the rocks through which it passes. The mineralized water is heated at depth and, under artesian pressure, returns to the surface through fractures in the rocks. When the hot mineralized water nears the surface, the drop in confining pressure causes loss of dissolved carbon dioxide and resultant deposition of calcium carbonate (tufa). The velocity of the upwelling water maintains "pipes" (which may be no more than zones of higher permeability) through the

growing tufa deposit. Increased deposition around the point of emergence of each pipe would eventually form the characteristic mounds.

When the height of a mound reached the limit of the artesian head of the water, the spring would no longer flow. However, evaporation at the surface would maintain upwelling through the pipe, bringing fresh supplies of mineralized water to the surface. Tufa would under these conditions precipitate within the pipe, thus reducing upwelling and eventually blocking it entirely. At some point in the blocking process, upwelling would be unable to keep pace with evaporation; the temperature of the water within the pot would begin to decline; and the water level in the pot would respond more and more slowly to head changes in the aquifer. When the upwelling through the pipe was entirely blocked, water might be maintained in the mound by inflow of shallow (water-table) water; but if the closed floor of the crater is above the water table, it will eventually dry up. If the permeability of a pipe were very low, the spring might be only a seep; there would be no tendency to form an open crater, and the resulting mound would be nearly solid tufa, as are most of the mounds in one of the principal clusters.

Examples of each stage in the process described above are present in the area. At least seven thermal springs flow, but have no mounds surrounding them. Most of the mounds in the two principal clusters of hot pots contain water, but do not flow. Two of the pots do overflow occasionally, and the water temperature in these two mounds is higher than that of their nonflowing neighbors. Each cluster of mounds includes some extinct pots with dry craters, and one cluster contains mostly solid mounds. Finally, there is one recognizable crater in Midway that is nothing more than a wall of tufa less than 2 feet high enclosing a circular flat area a few feet in diameter.

Thus it appears that the formation of the hot pots is a continuing activity, which has been going on for many hundreds of years.

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UGMS

WASHINGTON CO.

SEC.	T.	R.	DEPTH	°F
19 NE	43S	15W	5165	112

plotted

1 well

no anomalous