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SELECTED GEOTHERMAL RESOURCES DATA: HYDROTHERMAL
CONVECTION SYSTEMS IN THE STATES OF ALASKA,
ARIZONA, CALIFORNIA, COLORADO, HAWAII, IDAHO,
MONTANA, NEVADA, NEW MEXICO, OREGON, UTAH,
WASHINGTON, AND WYOMING

J. L. RENNER, ET AL

U.S. GEOLOGICAL SURVEY
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UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SELECTED GEOTHERMAL RESOURCES DATA: HYDROTHERMAL CONVECTION SYSTEMS
IN THE STATES OF ALASKA, ARIZONA, CALIFORNIA, COLORADO, HAWAII, IDAHO,
MONTANA, NEVADA, NEW MEXICO, OREGON, UTAH, WASHINGTON, AND WYOMING

By J. L. Renner and others

Prepared in cooperation with the
U.S. Energy Research and Development Administration

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Introduction

This report presents data on hydrothermal convection systems compiled for the assessment of United States geothermal resources. It includes all hot-water systems with surface temperatures greater than 90°C or evidence of subsurface temperatures greater than 100°C, which were known to the compilers in early 1975. For systems with lower temperatures, the reader is referred to the compilation of Waring (1965). The data sheets contain much of the geographic, geochemical, geologic, and bibliographic data used by Renner and others (1975) in estimating the heat content of hydrothermal convection systems in the United States. A large part of the data has been collected as part of the U.S. Geological Survey's research and land classification programs; however, data from professional publications and industry sources, when available, have also been incorporated. Most of the data have been published previously.

Time limitations preclude the compilation from being comprehensive; however, we believe provisional compilations serve a purpose.

The data sheets for each State are arranged first by system type and second by geographic location. Data sheets for vapor-dominated systems are followed by hot-water systems greater than 150°C and then by hot-water systems between 90° and 150°C. The systems within each type are arranged geographically from north to south and west to east. Complete citations of the references on the data sheets follow the listings for each State.

Figures 1 to 3 show the locations of the hydrothermal convection systems and tables 1 and 2 incorporate a summary of the data for the hot-water systems.

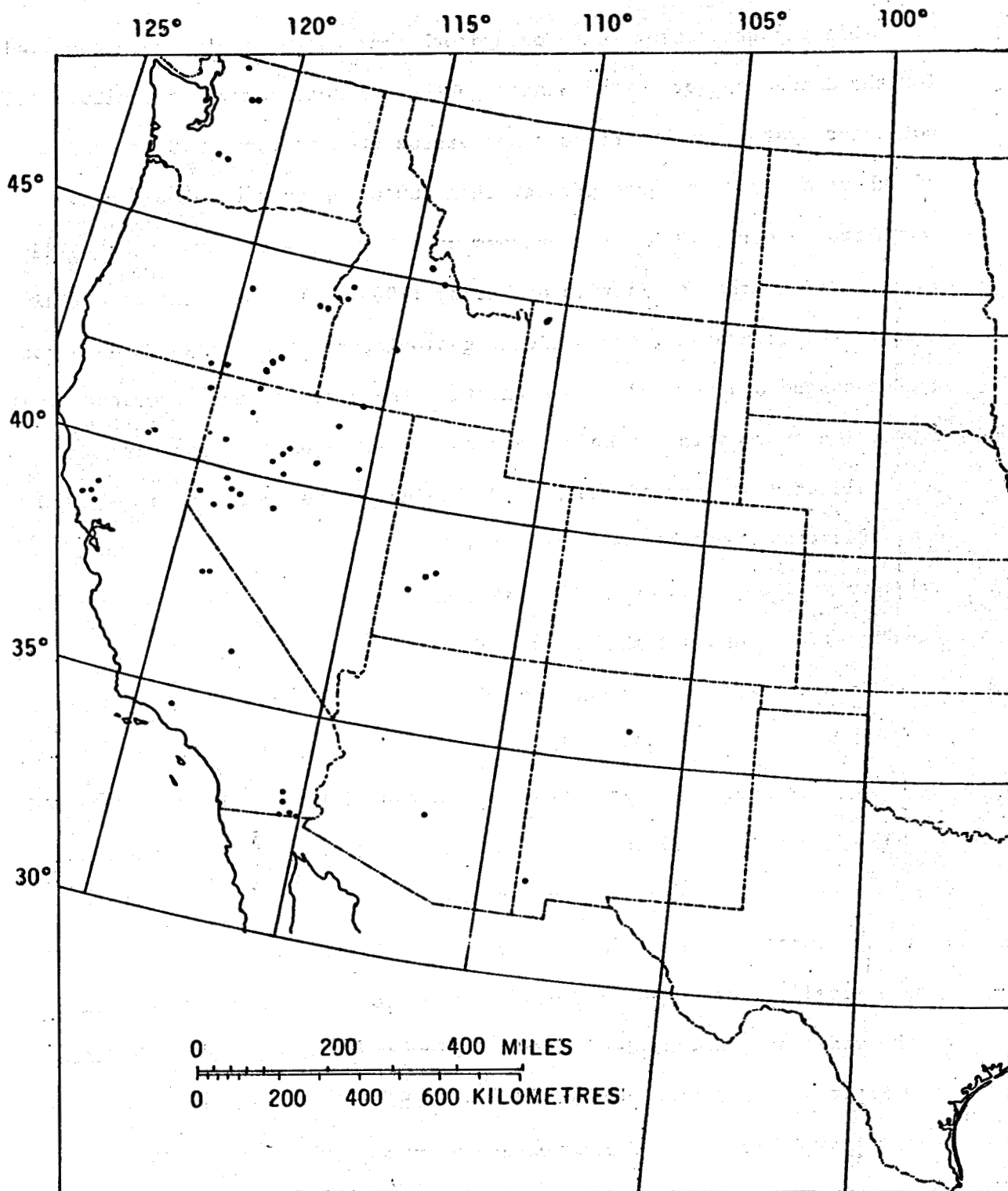


Figure 1.--Location of hydrothermal convection systems in the conterminous United States with indicated subsurface temperatures above 150°C (Remmer and others, 1975).

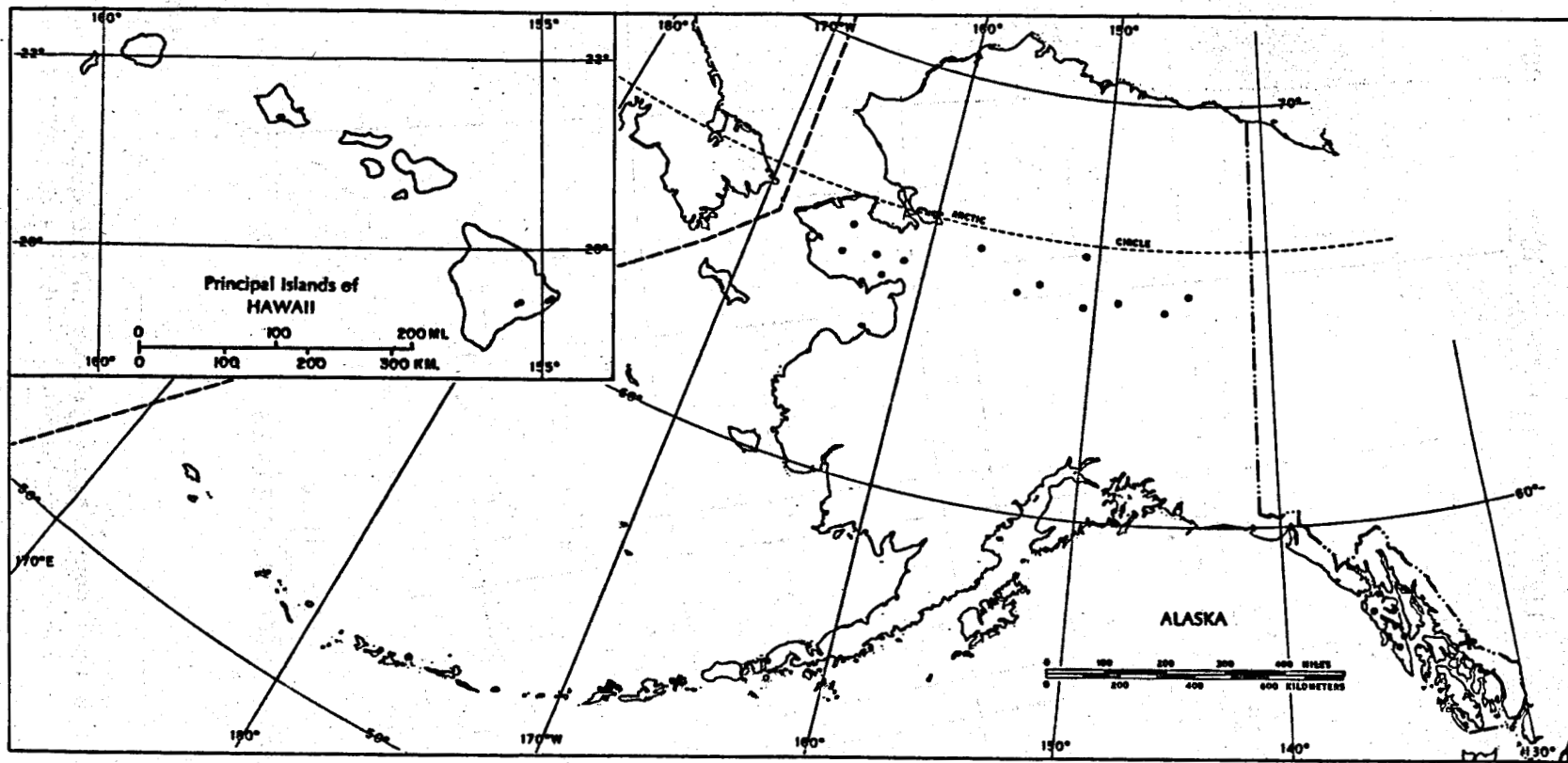


Figure 2.—Location of hydrothermal convection systems in Alaska and Hawaii with indicated subsurface temperatures above 150°C (+) and between 90° and 150°C (dots) (Renner and others, 1975).

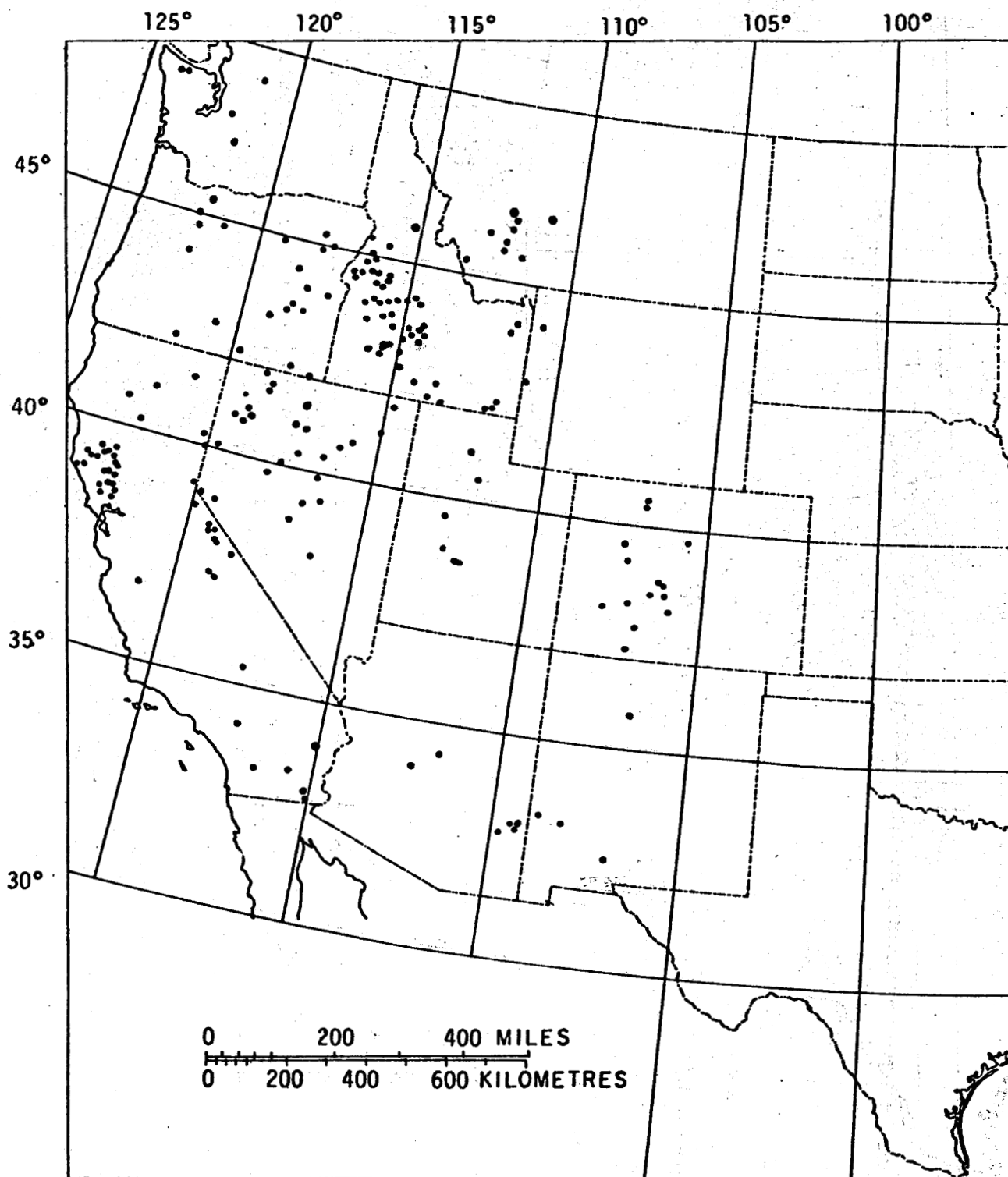


Figure 3.--Location of hydrothermal convection systems in the conterminous United States with indicated subsurface temperatures between 90° and 150°C (Renner and others, 1975).

TABLE 1.—HOT-WATER SYSTEMS GREATER THAN 150°C

LOCATION		TEMPERATURE DEG C						SUB-	THICK-	PL-	HEAT	
NAME	LATI-	LONGI-	SUR-	GEO-				SUB-	SUR-	THICK-	PL-	CON-
	TUDE	TUDE	FACE	CHEMICAL				FACE	AREA	NESS	UME	TENT
				SIO2	SIO2	NA-	NA-					
				AD	COND	K-CA	K-CA		KM**2	KM	KM**3	E+18
						1/3	4/3					
NOT REPRODUCIBLE												
AL												
GEYSER BIGHT	53 13.0	168 28.0	100	192	210	236	493	210	4.0	2.00	8.0	0.9
HOT SPRINGS COVE. UMNK	53 14.0	168 21.0	89	127	131	154	115	155	2.0	2.00	4.0	0.3
SHAKES SPRINGS (CHIEF SH	56 43.0	132 2.0	52	136	142	176	106	155	1.5	1.50	2.3	0.2
HOT SPRINGS BAY, AKUTAN	54 10.0	165 50.0	83	145	152	179	167	180	1.5	1.50	2.3	0.2
AZ												
POWER RANCHES INC. WELLS	33 17.1	111 41.2		0	0	0	0	180	2.5	1.00	2.5	0.2
CA												
SURPRISE VALLEY	41 40.0	120 12.0	97	163	174	159	154	175	125.0	2.00	250.0	24.0
MORGAN SPRINGS	40 23.0	121 31.0	95	177	191	229	251	210	5.0	2.00	10.0	1.2
SULFUR BANK MINE (CLEAR	39 1.0	122 39.0	69	169	181	157	201	185	2.5	1.50	3.8	0.4
CALISTOGA	38 34.9	122 34.4		149	157	155	144	160	4.5	2.00	9.0	0.8
SKAGGS HOT SPRINGS	38 41.6	123 1.5	57	143	150	153	194	155	2.0	1.50	3.0	0.2
LONG VALLEY	37 40.0	118 52.0	94	200	219	238	344	220	225.0	2.00	450.0	55.0
REDS MEADOW HOT SPRINGS	37 37.0	119 4.5	49	0	0	0	0	165	1.5	1.50	2.3	0.2
COSO HOT SPRINGS	36 3.0	117 47.0	95	153	161	238	275	220	168.0	2.00	336.0	41.3
SESPE HOT SPRINGS	34 35.7	118 59.9	90	129	133	155	130	155	1.5	1.50	2.3	0.2
SALTON SEA	33 12.0	115 36.0	101	0	0	0	0	340	54.0	2.00	108.0	21.0
BRAWLEY	33 1.0	115 31.0		0	0	0	0	200	18.0	1.50	27.0	3.0
HEBER	32 43.0	115 31.7		0	0	0	0	190	50.0	2.00	100.0	11.0
EAST MESA	32 47.0	115 15.0		0	0	0	0	180	28.0	2.00	56.0	5.5
BORDER	32 44.0	115 7.6		0	0	0	0	160	3.0	0.60	1.8	0.2
SALT SPRING	39 25.8	122 32.3	25	149	157	123	222	150	1.5	1.50	2.3	0.2
CRAFTREE HOT SPRINGS	39 17.4	122 49.3	41	154	163	133	167	150	1.5	1.50	2.3	0.2
ID												
BIG CREEK H.S.	45 18.8	114 19.2	82	153	161	173	163	175	2.0	1.50	3.0	0.3
SHARKEY H.S.	45 0.9	113 51.1	52	128	132	173	166	175	2.0	1.50	3.0	0.3
WEISER	44 17.9	117 2.9	77	149	157	142	128	160	35.0	2.00	70.0	6.1
GRANZ CREEK	44 18.3	116 44.7	92	162	173	166	133	180	30.0	2.00	60.0	5.9
WELL NEAR CAMBRIDGE	44 34.4	116 40.7		117	119	180	135	180	1.5	1.50	2.3	0.2
WARDROP H.S.	43 23.0	114 55.9	66	118	121	154	114	155	1.5	1.50	2.3	0.2
NE												
BALTAZOR HOT SPRINGS	41 55.3	118 42.7	80	156	165	152	125	170	1.5	2.00	3.0	0.3
EAST & WEST PINTO HOT SP	41 21.0	118 47.0	93	153	161	176	163	165	5.0	1.50	7.5	0.7
GREAT BOILING SPRINGS (G	40 39.7	119 21.7	90	158	167	205	230	170	10.0	2.50	25.0	2.3
HOT SULPHUR SPRINGS (TUS	41 28.2	116 9.0	90	158	167	184	139	185	1.5	1.50	2.3	0.2
UNNAMED HOT SPRINGS NEAR	41 10.9	114 59.4	61	135	140	181	124	180	1.5	1.50	2.3	0.2
SULPHUR HOT (HOT SULPHUR	40 35.2	115 17.1	93	171	183	181	190	190	4.0	2.50	10.0	1.0
DEOWAVE	40 34.2	116 34.8	98	226	252	242	292	240	21.0	2.00	42.0	5.7
KYLE HOT SPRINGS	40 24.5	117 52.9	77	153	161	211	169	180	1.5	1.50	2.3	0.2
LEACH HOT SPRINGS	40 36.2	117 38.7	96	147	155	176	139	170	4.0	2.50	10.0	0.9
UNNAMED HOT SPRINGS (HOT	40 45.7	117 29.5	85	143	150	180	139	180	1.5	1.50	2.3	0.2
UNNAMED HOT SPRING (JERS	40 10.7	117 29.4	29	137	143	182	119	185	1.5	1.50	2.3	0.2
FLOWING WELL IN STILLWAT	39 31.3	118 33.1	96	159	169	140	150	160	10.0	2.50	25.0	2.2
SODA LAKE	39 34.0	118 49.0		156	165	161	159	165	5.0	2.50	12.5	1.1
BRADY	39 47.2	119 0.0	98	179	193	0	0	214	12.0	2.50	30.0	3.6
STEAMBOAT SPRINGS	39 23.0	119 45.0	96	190	207	226	296	210	6.0	2.70	16.0	1.9
WABUSKA HOT SPRINGS	39 9.7	119 11.0	97	139	145	152	112	155	1.5	1.50	2.3	0.2

TABLE 1.--HOT-WATER SYSTEMS GREATER THAN 150°C--CONTINUED

LOCATION			TEMPERATURE DEG C						SUB-	THICK-	PL-	HEAT
NAME	LATI- TUDE	LONGI- TUDE	SUR- FACE	GEO- CHEMICAL				SUB- SUR- FACE	SURFACE AREA KM**2	NESS KM	UME KM**3	CONT ENT E*18
				SI02 AD	SI02 COND	NA- K-CA 1/3	NA- K-CA 4/3					
NE												
LEE HOT SPRINGS	39 12.6	118 43.4	88	162	173	162	137	175	1.5	1.50	2.3	0.2
UNNAMED HOT SPRINGS (SMI)	39 21.4	117 32.8	86	137	143	157	138	160	1.5	1.50	2.3	0.2
VALLES CALDERA	35 43.0	106 32.0	87	0	0	0	0	240	65.0	2.00	130.0	18.0
LIGHTNING DOCK AREA	32 8.5	108 50.0		148	156	168	144	170	1.5	1.50	2.3	0.2
OR												
MICKEY SPRINGS	42 40.5	118 20.7	73	168	180	207	330	210	6.0	2.00	12.0	1.4
ALVORD HOT SPRING	42 32.6	118 31.6	76	141	148	199	254	200	3.0	1.50	4.5	0.5
HOT LAKE	42 20.1	118 36.0	36	156	165	176	178	180	6.0	2.00	12.0	1.2
VALE HOT SPRINGS	43 59.4	117 14.1	97	145	153	157	135	160	50.0	2.00	100.0	8.7
NEAL HS	44 1.4	117 27.6	87	162	173	181	151	180	2.0	2.00	4.0	0.4
LAKEVIEW (HUNTERS, BARRY)	42 12.0	120 21.6	96	149	157	143	114	160	8.0	2.00	16.0	1.4
CRUMPS SPRING	42 15.0	119 53.0	78	162	173	144	123	180	4.0	2.00	8.0	0.8
WEBERG M.S.	44 0.0	119 38.8	44	124	127	170	162	170	1.5	1.50	2.3	0.2
UT												
ROOSEVELT HOT SPRING	38 30.0	112 50.0	88	195	213	284	446	230	4.0	2.00	8.0	1.0
COVE FORT - SULPHURDALE	38 36.0	112 33.0		143	150	0	0	200	15.0	1.50	22.5	2.5
THERMO HOT SPRINGS	38 11.0	113 12.2	90	139	144	200	153	200	1.5	1.50	2.3	0.2
WA												
BAKER HOT SPRING	48 45.9	121 40.2	42	149	157	162	131	165	1.5	1.50	2.3	0.2
GAMMA HOT SPRING	48 10.0	121 2.0	60	153	161	220	191	165	1.5	1.50	2.3	0.2
KENNEDY	48 7.1	121 11.7	43	148	155	199	195	160	1.5	1.50	2.3	0.2
WY												
YELLOWSTONE PARK	44 36.0	110 30.0	96	0	0	0	0	250	375.0	2.50	940.0	133.0

NOT REPRODUCIBLE

TABLE 2.--HOT-WATER RESERVOIRS 90 TO 150°C

LOCATION		TEMPERATURE DEG C							SUB-SURFACE	THICK-NESS	VOL-UME	HEAT CON-TENT
NAME	LATI-TUDE	LONGI-TUDE	SUR-FACE	GEO-CHEMICAL				SUB-SUR-FACE	KM**2	KM	KM**3	E+18
				SI02 AD	SI02 COND	NA-K-CA 1/3	NA-K-CA 4/3					
NOT REPRODUCIBLE												
AL												
OKMOK CALDERA UMNAK I	53 29.0	168 6.0	100	109	110	164	75	125	3.0	2.00	6.0	0.4
GREAT SITKIN ISLAND	52 4.0	176 5.0	99	0	0	0	0	125	1.5	1.50	2.3	0.1
PILGRIM HOT SPRING	65 6.0	164 55.0	88	133	138	146	120	150	1.5	1.50	2.3	0.2
SERPENTINE SPRINGS (ARCT H.S. NEAR LAVA CREEK	65 51.0	164 42.0	77	128	132	161	151	140	1.5	1.50	2.3	0.2
H.S. NEAR CLEAR CREEK	65 13.0	162 54.0	65	125	128	118	91	125	1.5	1.50	2.3	0.1
H.S. NEAR CLEAR CREEK	64 51.0	162 18.0	67	124	127	123	82	125	1.5	1.50	2.3	0.1
GRANITE MTN. (SWEEPSTAKE SOUTH	65 22.0	161 15.0	49	120	122	116	75	130	1.5	1.50	2.3	0.2
MELOZI (MELOZITNA) H.S.	66 9.0	157 7.0	50	113	115	115	72	120	1.5	1.50	2.3	0.1
LITTLE MELOZITNA	65 8.0	154 40.0	55	121	124	0	0	130	1.5	1.50	2.3	0.2
KANGUI	65 28.0	153 19.0	38	122	126	0	0	130	1.5	1.50	2.3	0.2
MANLEY H.S. (BAKER)	66 20.0	150 48.0	66	0	0	136	114	140	1.5	1.50	2.3	0.2
TGLOVANA	65 0.0	150 38.0	59	113	115	137	114	140	1.5	1.50	2.3	0.2
CHENA	65 16.0	148 50.0	60	120	122	162	110	130	1.5	1.50	2.3	0.2
CIRCLE	65 3.0	146 3.0	57	125	129	137	129	140	1.5	1.50	2.3	0.2
E. COLD BAY	65 29.0	144 39.0	54	130	135	143	108	145	1.5	1.50	2.3	0.2
NEAR N. END TENAKEE INLE	55 13.0	162 29.0	54	115	117	144	110	145	1.5	1.50	2.3	0.2
HOONIAH H.S. (WHITE SULP	58 0.0	135 55.0	82	141	147	120	72	150	1.5	1.50	2.3	0.2
TENAKEE H.S.	57 48.0	136 20.0	44	132	136	0	0	140	1.5	1.50	2.3	0.2
H.S. NEAR FISH BAY	57 47.0	135 13.0	43	110	111	101	63	115	1.5	1.50	2.3	0.1
BARANOF H.S.	57 22.0	135 23.0	47	137	143	0	0	150	1.5	1.50	2.3	0.2
GOUDARD H.S.	57 5.0	134 50.0	51	117	119	112	68	125	1.5	1.50	2.3	0.1
BAILEY H.S.	56 50.0	135 22.0	65	141	148	147	129	150	1.5	1.50	2.3	0.2
BELL ISLAND H.S.	55 59.0	131 39.5	88	150	158	0	0	150	1.5	1.50	2.3	0.2
AZ												
VERDE HOT SPRINGS	95 56.0	131 34.0	72	135	140	0	0	145	1.5	1.50	2.3	0.2
CASTLE HOT SPRINGS	34 21.5	111 42.5	36	0	0	0	0	150	1.5	1.50	2.3	0.2
HOT SPRING N. OF CLIFTON	33 59.1	112 21.6	50	0	0	0	0	110	1.5	1.50	2.3	0.1
CLIFTON HOT SPRINGS	33 4.7	109 18.2	59	133	138	174	165	140	1.5	1.50	2.3	0.2
EAGLE CREEK SPRING	33 3.2	109 17.8	75	106	107	160	139	110	1.5	1.50	2.3	0.1
GILLARD HOT SPRINGS	33 2.8	109 28.6	36	0	0	0	0	115	1.5	1.50	2.3	0.1
MT. GRAHAM HOT MINERAL W	32 58.5	109 21.0	82	130	135	138	130	140	1.5	1.50	2.3	0.2
CA	32 51.4	109 44.9	42	0	0	0	0	110	1.5	1.50	2.3	0.1
KELLY HOT SPRING	41 27.5	120 50.0	96	144	151	122	85	150	1.5	2.00	3.0	0.2
HUNT HOT SPRINGS	41 2.1	121 55.1	58	102	101	112	75	105	1.5	1.50	2.3	0.1
BIG BEND HOT SPRINGS	41 1.3	121 55.1	82	118	121	137	110	140	1.5	1.50	2.3	0.2
SALT SPRING	40 40.2	122 38.7	20	106	107	62	55	110	1.5	1.50	2.3	0.1
WEHDEL - AMEED	40 18.0	120 11.0	95	131	135	129	101	140	7.0	2.00	14.0	1.1
TUSCAN (LICK) SPRINGS	40 14.5	122 8.4	30	132	137	112	258	140	1.5	1.50	2.3	0.2
SODA SPRING	39 24.8	122 58.6	17	141	148	158	154	150	1.5	1.50	2.3	0.2
FOUTS SPRING (PEDEYE)	39 21.0	122 40.1	26	143	150	126	182	150	1.5	1.50	2.3	0.2
FOUTS SPRING (CHAMPAGNE)	39 20.5	122 39.4	17	115	117	128	-4	130	1.5	1.50	2.3	0.1
ORRS SPRINGS (ORRS HOT S	39 13.8	123 21.9	40	111	112	86	67	115	1.5	1.50	2.3	0.1
VICHY SPRINGS (DOOLINS U	39 9.9	123 9.4	32	128	132	145	152	135	1.5	1.50	2.3	0.2
COOKS SPRINGS	39 15.2	122 31.4	17	128	132	187	204	140	1.5	1.50	2.3	0.2
SARATOGA SPRINGS	39 10.5	122 58.7	16	132	137	116	46	140	1.5	1.50	2.3	0.2
WILBUR H.S. AREA	39 2.2	122 5.2	60	168	180	240	781	145	16.0	2.00	32.0	2.5

TABLE 2.--HOT-WATER RESERVOIRS 90 TO 150°C--CONTINUED

LOCATION NAME	LATI- TUDE		LONGI- TUDE		SUR- FACE	TEMPERATURE DEG C				SUB- SUR- FACE	SUB- SURFACE AREA KM**2	THICK- NESS KM	VOL- UME KM**3	HEAT CON- TENT E+18
	GEO- CHEMICAL		SI02 AD	SI02 COND		NA- K-CA 1/3	NA- K-CA 4/3							
NOT REPRODUCIBLE														
CA														
DEADSHOT SPRING	39	5.1	122	27.4	26	131	136	204	228	135	1.5	1.50	2.3	0.2
POINT ARENA HOT SPRINGS	38	52.6	123	30.6	44	105	105	63	62	105	1.5	1.50	2.3	0.1
ORNBAUM SPRINGS	38	54.7	123	18.4	16	123	126	122	-3	125	1.5	1.50	2.3	0.1
SEIGLER SPRINGS (INCLUDI	38	52.5	122	41.3	52	159	169	188	122	150	2.0	1.50	3.0	0.2
BAKER SODA SPRING	38	53.6	122	31.9		123	126	202	271	130	1.5	1.50	2.3	0.1
ONE SHOT MINING CO.	38	50.0	122	21.4	22	130	135	153	108	150	1.5	1.50	2.3	0.2
AETNA SPRINGS	38	39.5	122	28.7	33	131	135	110	94	135	1.5	1.50	2.3	0.2
WALTER SPRINGS (WALTERS	38	39.2	122	21.4	19	130	134	117	82	135	1.5	1.50	2.3	0.2
MARK WEST SPRINGS	38	32.9	122	43.2	31	135	140	162	48	140	1.5	1.50	2.3	0.2
NAPA ROCK (PRIEST) SODA	38	31.1	122	15.6	26	138	143	133	81	145	1.5	1.50	2.3	0.2
LOS GUILICOS WARM SPRING	38	23.7	122	33.0	31	126	129	184	111	135	1.5	1.50	2.3	0.2
NAPA SODA SPRINGS (JACKS	38	23.4	122	16.7	16	144	151	182	60	150	1.5	1.50	2.3	0.2
BROCKWAY (CAPNELIAN) HOT	39	13.5	120	4.0	60	0	0	0	0	120	1.5	1.50	2.3	0.1
GROVER'S HOT SPRINGS	38	41.9	119	51.6	63	131	135	126	108	140	1.5	1.50	2.3	0.2
FALES HOT SPRINGS	38	20.0	119	24.0	62	141	147	165	150	150	1.5	1.50	2.3	0.2
BUCKEYE HOT SPRING	38	14.3	119	19.6	64	0	0	0	0	140	1.5	1.50	2.3	0.2
BENTON HOT SPRINGS	37	48.0	118	31.8	57	0	0	0	0	115	1.5	1.50	2.3	0.1
TRAVERTINE (MARBLE GUARR	38	14.8	119	12.1	70	127	131	145	155	120	1.5	1.50	2.3	0.1
BLACK POINT H.S.	38	2.4	119	5.0		0	0	0	0	125	1.5	1.50	2.3	0.1
PAOMA ISLAND	37	59.8	119	1.2	83	0	0	0	0	125	1.5	1.50	2.3	0.1
MONO HOT SPRING	37	19.5	119	1.0	44	0	0	0	0	115	1.5	1.50	2.3	0.1
BLAYNEY MEADOWS H.S.	37	14.1	118	53.0	43	0	0	0	0	105	1.5	1.50	2.3	0.1
MERCY HOT SPRINGS	36	42.2	120	51.6	46	120	122	91	94	125	1.5	1.50	2.3	0.1
RANDESBURG STEAM WELL	35	23.0	117	32.2		0	0	0	0	125	1.5	2.50	3.8	0.2
ARROWHEAD HOT SPRINGS AR	34	8.6	117	15.2	94	128	132	147	111	150	2.0	1.50	3.0	0.2
PILGER ESTATES H.S.	33	26.0	115	41.1	82	122	125	145	132	145	1.5	1.50	2.3	0.2
WARNER H.S.	33	17.0	116	38.4	64	136	141	100	111	145	1.5	1.50	2.3	0.2
GLAMIS OR EAST BRAWLEY	32	58.0	115	11.0		0	0	0	0	135	2.0	1.50	3.0	0.2
GLAMIS (EAST)	33	59.0	115	4.0		0	0	0	0	135	4.0	1.50	6.0	0.4
DUNES	32	49.0	115	1.0		0	0	0	0	135	6.0	1.50	9.0	0.6
CO														
ROUTT HOT SPRING	40	33.6	106	51.0	64	127	131	169	137	135	1.5	1.50	2.3	0.2
STEAMBOAT SPRINGS	40	29.1	106	50.3	66	125	129	195	227	135	1.5	1.50	2.3	0.2
IDAHO SPRINGS	39	44.2	105	30.2	50	109	109	208	154	115	1.5	1.50	2.3	0.0
GLENWOOD SPGS	39	33.0	107	19.3	66	133	137	191	242	140	1.5	1.50	2.3	0.2
AVALANCHE SPRINGS	39	13.9	107	13.5	57	132	136	223	125	140	1.5	1.50	2.3	0.2
COTTONWOOD SPRINGS	38	48.7	106	13.5	62	106	107	117	83	110	4.0	1.50	6.0	0.3
MT. PRINCETON SPRINGS	38	43.9	106	10.2	65	111	112	113	52	115	5.0	1.50	7.5	0.4
PONCHA HOT SPRINGS	38	29.9	106	4.5	76	126	129	143	108	145	1.5	1.50	2.3	0.2
MINERAL (CHAMBERLAIN) MO	38	10.1	105	55.0	63	103	103	168	91	105	1.5	1.50	2.3	0.1
WADUNITA (LOWER SPG.)	38	31.0	106	29.1	71	126	129	106	87	130	1.5	1.50	2.3	0.2
CEBOLLA (POWDERHORN)	38	16.5	107	5.9	46	122	125	233	144	130	1.5	1.50	2.3	0.2
GRVIS (RIDGEWAY)	38	8.0	107	44.0	58	108	109	231	141	110	1.5	1.50	2.3	0.1
WAGON WHEEL GAP	37	45.0	106	49.3	66	126	129	188	152	135	1.5	1.50	2.3	0.2
PAGOSA (ARLINGTON HOTEL	37	15.5	107	0.5	70	156	166	278	204	150	1.5	1.50	2.3	0.2
HA														
STEAMING FLATS AREA (SU	19	26.5	155	16.0	97	0	0	0	0	150	1.5	1.50	2.3	0.2
UPPER KAU AREA	19	23.7	155	17.3	22	0	0	0	0	100	5.0	0.70	3.5	0.2

TABLE 2.--HOT-WATER RESERVOIRS 90 TO 150°C--CONTINUED

LOCATION		TEMPERATURE DEG C							SUB-SURFACE AREA	THICKNESS	VOLUME	HEAT CONTENT
NAME	LATITUDE	LONGITUDE	SURFACE	GEO-CHEMICAL				SUB-SURFACE	KM**2	KM	KM**3	E+18
				SI02 AD	SI02 COND	NA-K-CA 1/3	NA-K-CA 4/3					
NOT REPRODUCIBLE												
HI												
1955 ERUPTION AREA (EAST)	19 26.5	154 57.0		0	0	0	0	150	2.0	2.00	4.0	0.3
PUULENA AREA (EAST RIFT)	19 28.3	154 53.0		0	0	0	0	150	2.0	2.00	4.0	0.3
ID												
MURPHY H.S.	42 2.2	115 32.4	51	124	127	160	112	160	1.5	1.50	2.3	0.2
RED RIVER H.S.	45 47.3	115 8.8	55	120	123	110	80	125	1.5	1.50	2.3	0.1
RIGGINS H.S.	45 24.7	116 28.5	47	118	120	117	95	125	1.5	1.50	2.3	0.1
BURGDORF H.S.	45 16.7	115 55.2	45	118	121	98	57	125	1.5	1.50	2.3	0.1
ZIM S RESORT HOT SPRINGS	45 2.6	116 17.0	65	113	114	110	83	120	1.5	1.50	2.3	0.1
KRIGBAUM H.S.	44 58.1	116 11.4	43	118	121	120	96	125	1.5	1.50	2.3	0.1
STANKEY HOT SPRINGS	44 51.2	116 25.8	56	107	108	105	70	115	1.5	1.50	2.3	0.1
WHITE LICKS HOT SPRINGS	44 40.9	116 13.8	65	137	143	145	122	150	1.5	1.50	2.3	0.2
SPRINGS NEAR COVE SCHOOL	44 35.0	116 37.7	70	118	120	109	78	125	1.5	1.50	2.3	0.1
SPRING NEAR DEER CREEK	44 32.4	116 45.0	50	106	107	110	63	110	1.5	1.50	2.3	0.1
WELL NEAR MIDVALE	44 28.3	116 43.9		125	128	243	154	135	1.5	1.50	2.3	0.2
WELL NEAR MIDVALE AIRPOR	44 28.2	116 45.9		118	121	78	51	125	1.5	1.50	2.3	0.1
HOT CREEK SPRINGS	44 38.5	116 2.7	34	110	111	86	62	115	1.5	1.50	2.3	0.1
MOLLY S H.S.	44 38.3	115 41.6	59	126	130	113	83	135	1.5	1.50	2.3	0.2
VULCAN H.S.	44 34.1	115 41.5	87	141	148	135	114	150	1.5	1.50	2.3	0.2
CABARTON H.S.	44 25.0	116 1.7	71	121	124	115	99	130	1.5	1.50	2.3	0.1
BOILING SPNGS	44 21.9	115 51.4	86	130	134	118	89	140	1.5	1.50	2.3	0.2
SPRING NEAR PAYETTE RIVE	44 5.1	116 3.0	80	141	148	139	113	150	1.5	1.50	2.3	0.2
SPRING NEAR GRIMES PASS	44 2.8	115 51.1	55	109	110	103	74	115	1.5	1.50	2.3	0.1
KIRKHAM H.S.	44 4.3	115 32.6	65	116	118	110	79	120	1.5	1.50	2.3	0.1
BONNEVILLE H. S.	44 9.5	115 18.4	85	133	138	142	103	145	1.5	1.50	2.3	0.2
STANLEY H.S.	44 13.5	114 55.6	41	106	107	77	47	110	4.0	1.50	6.0	0.3
SUNDEAN H.S.	44 16.1	114 44.9	76	128	132	129	109	140	1.5	1.50	2.3	0.2
SLATE CREEK H.S.	44 10.1	114 37.5	50	126	129	146	91	130	1.5	1.50	2.3	0.1
ROYSTONE H.S. (AREA)	43 57.2	116 18.0	55	141	148	150	117	150	2.0	1.50	3.0	0.2
NE HOISE THERMAL AREA	43 36.1	116 9.9		121	124	106	79	125	4.0	2.00	8.0	0.5
NEINMEYER H.S.	43 45.5	115 34.7	76	133	138	126	103	140	1.5	1.50	2.3	0.2
DUTCH FRANKS SPRING	43 47.7	115 25.5	65	118	120	110	71	125	1.5	1.50	2.3	0.1
PARADISE H.S.	43 33.2	115 16.3	56	116	118	108	72	120	1.5	1.50	2.3	0.1
WORSWICK (WASEWICK) H.S.	43 33.5	114 47.2	81	131	135	124	93	140	1.5	1.50	2.3	0.2
GUYER HOT SPRINGS	43 40.5	114 24.6	70	126	129	120	88	135	1.5	1.50	2.3	0.2
CLARENDON HOT SPRINGS	43 33.6	114 24.9	47	122	126	114	87	130	1.5	1.50	2.3	0.2
HAILLEY HOT SPRINGS	43 30.3	114 22.0	63	125	129	114	83	135	1.5	1.50	2.3	0.2
WELL NEAR BROCKIE AIRPOR	43 32.4	118 30.1	41	106	107	214	91	110	1.5	1.50	2.3	0.1
ELK CRFEK H.S.	43 25.4	115 37.6	54	112	113	104	80	120	1.5	1.50	2.3	0.1
WELL NEAR PUNKIN CORNER	43 18.1	114 54.4	35	120	123	98	71	0	2.0	2.00	4.0	0.3
BARRONS H.S.	43 18.1	114 54.4	71	121	124	121	91	130	1.5	1.50	2.3	0.2
WELL NEAR MAGIC RESERVOI	43 19.7	114 23.2		133	138	163	139	140	1.5	1.50	2.3	0.2
WELL NEAR BENNETT CREEK	43 6.9	115 27.9		126	129	87	71	135	1.5	1.50	2.3	0.2
LATTY H.S.	43 7.0	115 18.3	55	133	138	137	124	140	1.5	1.50	2.3	0.2
WELL NEAR RYEGRASS CREEK	43 5.8	115 24.6		125	129	91	82	135	1.5	1.50	2.3	0.2
WELL NEAR RADIO TOWERS	43 2.2	115 27.5		126	129	125	114	130	1.5	1.50	2.3	0.2
WHITE ARROW H.S.	43 2.9	114 57.2	65	131	136	113	100	140	1.5	1.50	2.3	0.2
WELL NEAR CHALK MINE	43 2.9	114 55.0		129	133	151	98	140	1.5	1.50	2.3	0.2
WELL NEAR CLOVER CREEK	43 1.4	115 0.6		111	113	86	202	120	1.5	1.50	2.3	0.1

TABLE 2.--HOT-WATER RESERVOIRS 90 TO 150°C--CONTINUED

LOCATION		TEMPERATURE DEG C								SUB-SURFACE	THICKNESS	VOLUME	HEAT CONTENT
NAME	LATITUDE	LONGITUDE	SURFACE	GEO-CHEMICAL				SUB-SURFACE	KM**2	KM	KM**3	E+18	
ID				SI02 AD	SI02 COND	NA-K-CA 1/3	NA-K-CA 4/3						
NOT REPRODUCIBLE													
MO													
WELL NEAR GRAVEL PITS	42 54.3	115 29.5		109	109	144	141	145	1.5	1.50	2.3	0.2	
BRUNEAU-GRANDVIEW	42 56.0	115 56.0	84	133	138	208	93	145	250.0	1.50	3375.0	263.0	
BANBURY AREA	42 41.4	114 50.0		131	136	108	101	140	8.0	1.50	12.0	0.9	
WELL NEAR CEDAR HILL	42 24.9	114 18.1		115	116	213	65	120	6.0	1.50	9.0	0.6	
WELL NEAR BRIDGER SPRING	42 28.7	113 37.5		110	111	131	89	115	1.5	1.50	2.3	0.1	
OAKLEY WARM SPRING	42 10.4	113 51.7	47	117	119	121	92	120	1.5	1.50	2.3	0.1	
RAFT RIVER	42 6.1	113 22.8		131	136	139	132	140	20.0	1.50	30.0	2.3	
MAPLE GROVE H.S.	42 18.2	111 42.2	76	106	107	236	187	110	2.0	1.50	3.0	0.2	
WELL NEAR RIVERDALE	42 9.9	111 50.4		122	126	170	147	125	1.5	1.50	2.3	0.1	
WYLAND H.S.	42 8.2	111 56.9	77	122	126	270	336	130	5.0	1.50	7.5	0.5	
WELL NEAR NEWDALE	43 53.2	111 35.4		120	122	169	84	125	1.5	1.50	2.3	0.1	
ASHTON WARM SPRING	44 5.7	111 27.5	41	137	143	139	91	145	1.5	1.50	2.3	0.2	
NE													
HELENA HOT SPRINGS (BROA	46 36.5	112 5.0	65	0	0	0	0	140	1.5	1.50	2.3	0.1	
WHITE SULPHUR SPRINGS	46 32.8	110 54.2	57	0	0	0	0	150	1.5	1.50	2.3	0.2	
ALHAMBRA	46 27.0	111 59.0	59	0	0	0	0	120	1.5	1.50	2.3	0.1	
BOULDER	46 12.0	112 5.6	76	0	0	0	0	145	1.5	1.50	2.3	0.1	
GREGSON HOT SPRINGS	46 2.6	112 48.4	74	0	0	0	0	130	1.5	1.50	2.3	0.1	
PIPESTONE	45 53.8	112 13.9	61	0	0	0	0	120	1.5	1.50	2.3	0.1	
BARKELS (SILVER STAR) MO	45 41.5	112 17.2	72	0	0	0	0	145	1.5	1.50	2.3	0.1	
NORRIS (HAPGOOD)	45 34.6	111 41.0	52	0	0	0	0	150	1.5	1.50	2.3	0.1	
JARDINE (JACKSON OR BIG	45 21.8	113 24.7	58	0	0	0	0	150	1.5	1.50	2.3	0.2	
NE													
BOG HOT SPRINGS	41 55.5	118 48.1	88	108	109	109	127	115	2.0	2.00	4.0	0.2	
HOWARD HOT SPRINGS	41 43.3	118 30.3	56	125	129	110	81	130	1.5	1.50	2.3	0.1	
DYKE HOT SPRINGS	41 34.0	118 33.7	66	125	129	137	136	140	1.5	1.50	2.3	0.2	
UNNAMED HOT SPRINGS NEAR	41 21.5	119 13.2	54	112	113	98	64	115	6.0	2.00	12.0	0.7	
DOUBLE HOT SPRING	41 3.0	119 2.8	80	135	140	127	113	145	10.0	2.00	20.0	1.6	
UNNAMED HOT SPRINGS NEAR	40 57.0	118 58.0	90	141	148	116	151	150	1.5	1.50	2.3	0.2	
FLY RANCH (WARDS)	40 52.0	119 20.9	80	124	127	153	125	130	8.0	2.00	16.0	1.1	
BUTTE SPRINGS (TREGO)	40 46.0	119 7.0	86	125	129	119	111	130	1.5	1.50	2.3	0.1	
MINERAL (SAN JACINTO) MO	41 47.3	114 43.3	60	124	127	129	103	130	1.5	1.50	2.3	0.2	
HOT HOLE (ELKO HOT SPRING	40 49.1	115 46.5	89	113	115	234	127	115	2.0	1.50	3.0	0.2	
UNNAMED HOT SPRINGS NEAR	40 42.0	116 8.0	79	117	119	218	81	120	1.5	1.50	2.3	0.1	
HOT SULPHUR (SULPHUR) SP	41 9.4	114 59.1	90	125	128	190	153	140	1.5	1.50	2.3	0.2	
HOT SPRINGS POINT	40 24.2	116 31.0	54	115	116	233	159	125	5.0	1.50	7.5	0.5	
WALTER HOT SPRINGS	39 54.1	116 35.2	72	115	117	212	78	120	2.0	1.50	3.0	0.2	
SPENCER HOT SPRINGS	39 19.0	116 51.0	72	121	124	210	140	125	1.5	1.50	2.3	0.1	
HOT POT (BLOSSOM HOT SPR	40 55.3	117 6.5	58	122	126	195	154	125	1.5	1.50	2.3	0.1	
BUFFALO VALLEY HOT SPRIN	40 22.1	117 19.5	79	122	126	198	140	130	4.0	2.50	10.0	0.7	
THE HOT SPRING	41 25.4	117 23.0	58	106	107	209	197	110	1.5	1.50	2.3	0.1	
GOLCONDA HOT SPRINGS	40 57.7	117 29.6	74	114	116	201	121	125	1.5	1.50	2.3	0.1	
SOU HOT SPRINGS (GILBERT	40 5.4	117 43.5	93	113	115	190	99	115	1.5	1.50	2.3	0.1	
DIXIE HOT SPRINGS	39 47.9	118 4.0	72	139	145	143	137	150	2.0	1.50	3.0	0.2	
THE NEEDLES (NEEDLE ROCK	40 8.8	119 40.5	98	137	143	214	183	145	2.0	1.50	3.0	0.2	
WALLEYS (GENOA) HOT SPRI	38 58.9	119 49.9	71	109	109	118	84	110	1.5	1.50	2.3	0.1	
NEVADA HOT SPRINGS (MIND	38 54.0	119 24.7	61	104	104	118	86	105	1.5	1.50	2.3	0.1	
DAWROUGH HOT SPRINGS	38 49.3	117 10.8	97	132	136	127	119	140	1.5	1.50	2.3	0.2	

TABLE 2.--HOT-WATER RESERVOIRS 90 TO 150°C--CONTINUED

LOCATION NAME	LATI- TUDE		LONGI- TUDE		SUR- FACE	TEMPERATURE DEG C				SUB- SUR- FACE	SUB- SURFACE AREA KM**2	THICK- NESS KM	VOL- UME KM**3	HEAT CON- TENT E-18
	SUR- FACE	GEO- CHEMICAL				SUB- SUR- FACE								
		SI02 AD	SI02 COND	NA- K-CA 1/3			NA- K-CA 4/3							
NOT REPRODUCIBLE														
NE														
UNNAMED WARM SP NEAR WAR	38	11.3	116	22.5	61	110	111	192	121	125	1.5	1.50	2.3	0.1
SARTHOLOMAE (CLOBE) HOT	39	24.3	116	20.8	54	125	129	92	72	130	1.5	1.50	2.3	0.1
JEMEZ SPRINGS (OJOS CALI	35	47.0	106	41.0	73	129	134	197	152	135	1.5	1.50	2.3	0.2
RADIUM	32	30.0	106	55.5	52	121	124	222	213	130	1.5	1.50	2.3	0.2
LOWER FRISCO H.S.	33	15.0	108	47.0		125	128	150	107	150	1.5	1.50	2.3	0.2
GILA HOT SPRINGS	33	12.0	108	12.0	68	119	121	114	77	125	1.5	1.50	2.3	0.1
OR														
MT HOOD	45	22.5	121	42.5	90	0	0	0	0	125	2.0	2.00	4.0	0.3
CAREY OR AUSTIN H.S.	45	1.2	122	0.6	86	123	126	118	87	125	1.5	1.50	2.3	0.1
KAMNEETAH H.S.	44	51.9	121	12.9	52	135	140	103	121	140	1.5	1.50	2.3	0.2
BREITENBUSH HOT SPRINGS	44	46.9	121	58.5	92	124	127	149	128	150	1.5	1.50	2.3	0.2
DEKNAP HOT SPRING	44	11.6	122	3.2	71	131	135	114	82	140	1.5	1.50	2.3	0.2
KLAMATH FALLS	42	15.0	121	45.0		132	136	130	80	120	240.0	2.00	480.0	30.0
SUMMER LAKE HOT SPRING	42	43.5	120	38.7	43	130	134	112	149	140	4.0	1.50	6.0	0.4
RADIUM H. S.	44	55.8	117	56.4	58	121	124	108	77	130	1.5	1.50	2.2	0.2
HOT LAKE	45	14.6	117	57.6	80	101	100	115	90	120	1.5	1.50	2.2	0.1
MEDICAL HOT SPRINGS	45	1.1	117	37.5	60	122	126	125	67	130	1.5	1.50	2.3	0.2
RITTER H.S.	44	53.7	119	8.6	41	117	119	93	71	125	1.5	1.50	2.3	0.1
FISHER HOT SPRINGS	42	17.9	119	46.5	68	121	124	165	108	130	3.0	1.50	4.5	0.3
BLUE MTN H.S.	44	21.3	118	34.4	58	100	99	126	118	130	1.5	1.50	2.3	0.2
UNNAMED (NEAR LITTLE VAL	43	53.5	117	30.0	70	139	145	119	109	150	1.5	1.50	2.2	0.2
DELAH H.S.	43	56.7	118	8.2	60	159	169	125	86	130	1.5	1.50	2.3	0.2
UNNAMED (NEAR RIVERSIDE)	43	28.0	118	11.3	63	137	143	137	96	150	1.5	1.50	2.3	0.2
CRANE HOT SPRINGS	43	26.4	118	38.4	78	124	127	124	113	130	1.5	1.50	2.2	0.1
HARNEY LAKE	43	10.9	119	6.2	68	129	133	130	150	135	3.0	1.50	4.5	0.3
TROUT CREEK	42	11.3	118	9.2	52	135	140	144	118	145	1.5	1.50	2.3	0.2
MC DERMITT	42	4.1	117	30.0	52	118	120	91	104	120	2.0	1.50	3.0	0.2
UT														
HOOPER	41	8.0	112	11.3	60	101	100	223	310	105	1.5	1.50	2.3	0.1
CRYSTAL HOT SPRINGS	40	29.0	110	54.0	58	103	102	196	135	135	1.5	1.50	2.3	0.2
BAKER HOT SPRING (ABRAHA	39	36.8	112	43.9	87	116	118	163	121	125	1.5	1.50	2.3	0.1
MEADOW HOT SPRINGS	38	51.8	112	30.0	41	100	99	96	68	105	1.5	1.50	2.3	0.1
MONROE HOT SPRINGS (COOP	38	38.2	112	6.4	76	109	110	172	117	120	5.0	1.50	7.5	0.5
JOSEPH HOT SPRINGS	38	36.7	112	11.2	64	129	133	141	132	140	1.5	1.50	2.3	0.2
WA														
LONGMIRE	46	45.1	121	48.7	21	159	169	168	99	170	1.5	1.50	2.3	0.2
SUMMIT CREEK MINERAL SPR	46	42.2	121	29.0	13	159	169	161	158	170	1.5	1.50	2.3	0.2
SOL DUC HOT SPRING	47	58.1	123	52.1	56	141	148	113	92	150	1.5	1.50	2.3	0.2
OLYMPIC HOT SPRINGS	47	58.9	123	41.2	52	122	126	107	87	130	1.5	1.50	2.3	0.2
SULPHUR CREEK HOT SPRING	48	15.3	121	10.8	37	120	122	113	109	125	1.5	1.50	2.3	0.1
GARLAND (SAN JUAN)	47	20.5	121	53.4	38	141	148	185	170	150	1.5	1.50	2.3	0.2
OHANAPECOSH HOT SPRINGS	46	44.2	121	33.6	49	122	126	164	160	130	1.5	1.50	2.3	0.2
NY														
HUCKLEBERRY	44	7.0	110	41.0	71	143	150	141	112	150	1.5	1.50	2.3	0.2
AUBURN	42	49.5	111	0.0	62	137	143	209	197	150	1.5	1.50	2.3	0.2

Explanation of data sheets

For the most part, the information shown on the data sheets is self-explanatory; but some comments on the format and specific entries are necessary. Scientific notation and exponential notation are symbolized as in the following: $KM^{**2} = km^2$, $KM^{**3} = km^3$; $6.13E+06 = 6.13 \times 10^6$, $6.1E18 = 6.1 \times 10^{18}$.

All temperatures are reported in degrees Celsius.

Name.--In most instances, the name is taken from the U.S. Geological Survey topographic map of the area or from names used by Waring (1965). Alternate names are listed in parentheses. An unnamed spring or well is listed as hot spring or well near a geographic feature named on the best available topographic map.

Resource category.--Each system is categorized by type and estimated average subsurface temperature; vapor dominated, hot water greater than $150^\circ C$, or hot water 90° to $150^\circ C$.

Waring fig: Number.--The figure and spring number assigned to the system by Waring (1965). If the system was not noted by Waring, the entry is blank.

Date.--The date of the last revision of the data sheet.

Location.--The location listed is the approximate center of the system. In most cases, the two-letter abbreviation for the State is used. Latitude and longitude are given in degrees and decimal minutes. ($44^\circ 38.3' = 44^\circ 38.3'$). Elevation is given in feet above mean sea level. To convert feet to metres, multiply by .3048.

Surface manifestations.--Lists the significant surficial thermal features.

Rock and structure type.--Rock and structure type dominant at the surface.

Surface discharge total.--Total flow from the springs or wells in the system is reported in litres per minute (L/MIN). If not known or estimated, the entry is left blank.

Calculated total discharge.--Litres of water of an assumed enthalpy necessary to flow through the system to supply the surface heat flow. If not known or estimated, left blank.

Total surface heat flow.--The heat flows listed come from a reference cited, unless noted otherwise in the comments. If heat flow is unknown or not estimated, 0.00E+00 is entered.

Area of surface expression.--Includes the areal extent of hot springs, alteration, and hot-spring deposits, where known. It does not include areas of temperature anomalies or geophysical anomalies. Single springs or wells are reported as 0.0 km², as are systems where the data do not indicate surface extent.

Temperature.--The reported range lists the minimum and maximum spring temperatures reported in the literature.

Chemical data.--The date of analysis, if known, is reported by month and year (zeroes denote unknown). Concentrations are given in parts per million. The geochemical temperatures are calculated from the listed analyses using Fournier and Truesdell's (1973) Na-K-Ca geothermometer and analytical expressions for the silica geothermometer (R. O. Fournier, oral commun., 1974). If flow is shown as 0.0, no estimate of the analyzed spring's flow was available.

Reservoir properties.--Taken from Renner and others (1975). A more extensive discussion of the reservoir properties is available in that report on pages 52 and 53.

Range in reservoir temperature.--The temperature range which is suggested by the geochemical indicators, and in a few cases, actual subsurface measurements. If the range is not estimated, the entry remains blank.

Best estimate average temperature.--The temperature chosen by Remner and others (1975) as an average for the convection system.

Area.--The subsurface area of the system. If the available data were not suggestive of extent, a value of 1.5 km² was arbitrarily assigned.

Based on.--Lists the types of data used in estimating areal extent. If available data were not useful in estimating areal extent, this entry is blank.

Depth to top of reservoir:--1 to 2 km in most systems.

Depth to bottom of reservoir.--Assumed to be 3 km for all systems.

Thickness.--Calculated from depths.

Volume.--Calculated from area and thickness.

Heat content.--Calculated from volume, reservoir temperature (less 15°C assumed ambient surface temperature), and volumetric specific heat assumed as 0.6 cal/cm³°C.

Porosity.--Based on measurements or inferred from rock type. If not measured or estimated, left blank.

Permeability and well flow.--If not known or estimated, left blank.

Geophysical surveys.--The geophysical data available and used to estimate reservoir properties. If no data used, left blank.

Developments.--Lists wells drilled or uses of the thermal water. At present, this is not a comprehensive listing.

References.--The principal references to geothermal activity, geology, or geophysics of the area.

Topographic maps.--Lists the U.S. Geological Survey topographic map at best available scale for the area.

Spring identified.--Notes whether or not the spring is identified on the listed topographic map.

Comments.--Any general comments on the system.

Prepared by.--Lists the person(s) entering data to the data sheet.

Following the data sheets for each State are complete citations for the references cited.

Acknowledgments

The preparation of the computer program by J. W. Browning (Geothermal Hot Springs, U.S. Geological Survey Program No. H403) is greatly appreciated. R. H. Mariner, J. B. Rapp, and T. S. Presser provided numerous geochemical data.

References cited

Fournier, R. O., and Truesdell, A. H., 1973, An empirical Na-K-Ca geothermometer for natural waters: *Geochim. et Cosmochim. Acta*, v. 37, p. 1255-1275.

Renner, J. L., White, D. E., and Williams, D. L., 1975, Hydrothermal convection systems, in White, D. E., and Williams, D. L., eds., *Assessment of geothermal resources of the United States--1975*: U.S. Geol. Survey Circ. 726, p. 5-57.

Waring, G. A., 1965, *Thermal springs of the United States and other countries of the world--A summary*: U.S. Geol. Survey Prof. Paper 492, 383 p.

Selected Geothermal Resources Assessment Data

Hydrothermal Convection Systems in Alaska

By: **Gerald Shearer, Anchorage, Alaska**

J. L. Renner, Denver, Colorado

and

K. E. Telleen, Menlo Park, California

Contents

Hot-Spring Data Sheets

Hot water greater than 150°C

Hot water from 90° to 150°C

References

INPA RECORD # 1 MIRRORED ON 3/76
NAME: GEYSER BIGHT, ALASKA RESOURCE CATEGORY: HOT WATER > 150 C
WARNING FIG: 9 NUMBER: 41 DATE: 02/75
LOCATION:

STATE: ALASKA COUNTY:
LATITUDE: 53 13.00 TOWNSHIP:
LONGITUDE: 168 28.00 RANGE:
ELEV: 0 SECTION: 1/4 1/4 B&M:
SURFACE MANIFESTATIONS: SINTER, HOT SPRING(S), GEYSER(S), FUMAROLE OR WARM VAPOR,

ROCK AND STRUCTURE TYPE: VOLCANIC
SURFACE DISCHARGE TOTAL: 200000.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 6.00E+06 CAL/SEC
AREA OF SURFACE EX: 0.2 KM**2
APPROX. # OF HOT SPRINGS: 22 SPRINGS

TEMPERATURE: RANGE OF SPRING TEMP. 100 C TO

MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: BYERS & BRANNOCK 1949

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
100	0.0	7.50	303.00	441.00	33.00	0.10	160.0	569.0	0

OTHER CHEMICAL DATA B - 49. MG - 15. LI - 3. F - 1.9

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
192.5	210.1	193.9	236.1	492.8

RESERVOIR PROPERTIES

RANGE IN RES TEMP 135 C TO 240 C ASSUMED

BEST EST. AVER. TEMP 210.0

AREA 1.0 TO 10.0 KM**2; BEST ESTIMATE 4.0 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.50 KM TO 1.50 KM; BEST ESTIMATE 1.00 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.50 TO 2.50 KM; BEST ESTIMATE 2.00 KM.

VOLUME 1.50 TO 25.00 KM**3; BEST ESTIMATE 8.00 KM**3

HEAT CONTENT > 15 C 0.11 TO 3.40 E18 CAL; BEST ESTIMATE 0.94 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MOARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1917, 1965; MILLER, 73; BYERS & BRANNOCK 1949; BYERS, 1959

TOPO MAPS: UMNAK 1:250,000

SPRING IDENTIFIED: NO

COMMENTS:

RECENT VOLCANISM PRESENT; 3 THERMAL AREAS IN 2 KM LONG ZONE. SMALL GEYSERS. NEAR OKMOK CALDERA

PREPARED BY: G. SHEARER, J. RENNER

NAME: GEYSER BIGHT, ALASKA

INPUT RECORD # 2 MIRRORED ON 3/76
NAME: HOT SPRINGS COVE, UMNAK I, ALASKA RESOURCE CATAGORY: HOT WATER > 150 C
WARING FIG: 9 NUMBER: 43 DATE: 02/75

LOCATION:

STATE: ALASKA COUNTY:
LATITUDE: 53 14.00 TOWNSHIP:
LONGITUDE: 168 21.00 RANGE:
ELEV: 0 SECTION: 1/4 1/4 B&M:

SURFACE MANIFESTATIONS: HOT SPRING(S), GEYSER(S),

ROCK AND STRUCTURE TYPE: VOLCANIC
SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 4.00E+05 CAL/SEC
AREA OF SURFACE EX: 1.0 KM**2
APPROX. # OF HOT SPRINGS: 28

TEMPERATURE: RANGE OF SPRING TEMP. 89 C TO

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: BYERS & BRANNOCK 1949

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HCO3
89	0.0	5.90	88.00	603.00	33.00	163.00	88.0	1126.0	67

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY		
126.8	130.6	101.3	1/3 153.6	4/3 114.8

RESERVOIR PROPERTIES

RANGE IN RES TEMP 125 C TO 180 C ASSUMED
BEST EST. AVER. TEMP 155.0
AREA 1.0 TO 3.0 KM**2; BEST ESTIMATE 2.0 KM**2
BASED ON
DEPTH TO TOP OF RES. 0.50 KM TO 1.50 KM; BEST ESTIMATE 1.00 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.50 TO 2.50 KM; BEST ESTIMATE 2.00 KM.
VOLUME 1.50 TO 7.50 KM**3; BEST ESTIMATE 4.00 KM**3
HEAT CONTENT > 15 C 0.10 TO 0.74 E18 CAL; BEST ESTIMATE 0.34 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1917, 1965; MILLER, 1973; BYERS & BRANNOCK, 1949; BYERS, 1959

TOPO MAPS: UMNAK I: 250,000

SPRING IDENTIFIED: NO

COMMENTS:

RECENT VOLCANISM PRESENT, NEAR OKHOK CALDERA, SMALL GEYSER

PREPARED BY: G. SHEARER, J. RENNER

NAME: HOT SPRINGS COVE, UMNAK I, ALASKA

INFO. RECORD # 3 MIRRORED ON 3/76
NAME: SHAKES SPRINGS (CHIEF SHAKES) ,ALASKA RESOURCE CATAGORY: HOT WATER > 150 C
WARING FIG: 9 NUMBER: 73 DATE: 02/75
LOCATION:

STATE: ALASKA COUNTY:
LATITUDE: 56 43.00 TOWNSHIP: 59S
LONGITUDE: 132 2.00 RANGE: 85E
ELEV: 100 SECTION: , 1/4 1/4 B&M: COPPER RIVER
SURFACE MANIFESTATIONS: HOT SPRING(S),

ROCK AND STRUCTURE TYPE: GRANITE INTRUSIVE
SURFACE DISCHARGE TOTAL: 380.0 L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: SEVERAL

TEMPERATURE: RANGE OF SPRING TEMP. 52 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM MOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: WARING, 1917

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HCO3
52	380.0	0.00	108.00	87.00	9.20	13.00	142.0	6.5	43

OTHER CHEMICAL DATA MG 0.2

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY		
136.4	141.9	114.0	1/3 175.5	4/3 105.6

RESERVOIR PROPERTIES

RANGE IN RES TEMP 135 C TO 175 C ASSUMED

BEST EST. AVER. TEMP 155.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.07 TO 0.38 E18 CAL; BEST ESTIMATE 0.18 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MUARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS: BATH HOUSE

REFERENCES: WARING, 1917, 1965; MILLER, 1973

TOPO MAPS: PETERSBURG C-1; 1:63,360

SPRING IDENTIFIED: YES

COMMENTS:

CHEMICAL DATA MAY NOT BE RELIABLE

PREPARED BY: G. SHEARER, J. RENNER

NAME: SHAKES SPRINGS (CHIEF SHAKES) , ALASKA

INPUT RECORD # 4 MIRRORED ON 3/76
NAME: HOT SPRINGS BAY, AKUTAN I., ALASKA RESOURCE CATEGORY: HOT WATER > 150 C
WARNING FIG: 9 NUMBER: 46 DATE: 02/75

LOCATION:
STATE: ALASKA COUNTY:
LATITUDE: 54 10.00 TOWNSHIP:
LONGITUDE: 165 50.00 RANGE:
ELEV: 0 SECTION: , 1/4 1/4 B&M:
SURFACE MANIFESTATIONS: HOT SPRING(S), FUMAROLE OR WARM VAPOR.

ROCK AND STRUCTURE TYPE: VOLCANIC
SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP. 83 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: BYERS & BARTH, 1953

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
83	0.0	7.00	128.00	288.00	21.00	9.90	39.0	350.0	192

OTHER CHEMICAL DATA B 11; MG 1.4; F 0.7

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY		
144.7	151.8	125.3	1/3 4/3 179.4 167.5	

RESERVOIR PROPERTIES

RANGE IN RES TEMP 140 C TO 185 C ASSUMED

BEST EST. AVER. TEMP 180.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.08 TO 0.41 E18 CAL; BEST ESTIMATE 0.22 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1917, 1965; MILLER, 1973; BYERS & BARTH, 1953

TOPO MAPS: UNIMAK 1:250,000

SPRING IDENTIFIED:NO

COMMENTS:

HOT SPRINGS AND FUMAROLES NEAR AKUTAN VOLCANO (ACTIVE)

PREPARED BY: G. SHEARER, J. RENNER

NAME: HOT SPRINGS BAY, AKUTAN I., ALASKA

INPUT RECORD # 5 MIRRORED ON 3/76
NAME: OKMOK CALDERA UMNAK I, ALASKA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 9 NUMBER: 42 DATE: 02/75

LOCATION:

STATE: ALASKA COUNTY:
LATITUDE: 53 29.00 TOWNSHIP:
LONGITUDE: 168 6.00 RANGE:
ELEV: 0 SECTION: 1/4 1/4 B&M:
SURFACE MANIFESTATIONS: SINTER, GEYSER(S), FUMAROLE OR WARM VAPOR, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: OKMOK CALDERA, VOLCANICS

SURFACE DISCHARGE TOTAL: L/MIN

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.2 KM**2

APPROX. # OF HOT SPRINGS: 18

TEMPERATURE: RANGE OF SPRING TEMP. 100 C TO 22 C OR

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: BYERS AND BRANNOCK, 1949

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
22	0.0	0.00	59.00	53.00	5.60	18.00	69.0	39.0	84

OTHER CHEMICAL DATA B-3, MG 7.5

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
109.3	110.2	78.8	164.1	75.1

RESERVOIR PROPERTIES

RANGE IN RES TEMP 75 C TO 180 C ASSUMED

BEST EST. AVER. TEMP 125.0

AREA 1.0 TO 60.0 KM**2; BEST ESTIMATE 3.0 KM**2

BASED ON GEOLOGY, SURFACE EXPRESSION

DEPTH TO TOP OF RES. 0.50 KM TO 1.50 KM; BEST ESTIMATE 1.00 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.50 TO 2.50 KM; BEST ESTIMATE 2.00 KM.

VOLUME 1.50 TO 150.00 KM**3; BEST ESTIMATE 6.00 KM**3

HEAT CONTENT > 15 C 0.05 TO 14.90 E18 CAL; BEST ESTIMATE 0.40 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1917, 1965; MILLER 1973; BYERS & BRANNOCK, 1949; BYERS, 1959

TOPO MAPS: UMNAK 1:250,000

SPRING IDENTIFIED:NO

COMMENTS:

HOLOCENE VOLCANISM PRESENT. MAY BE AS LARGE AS ENTIRE CALDERA ABOUT 60 KM**2. SILICEOUS SINTER REPORTED, MAY BE HIGHER THAN 180C, SMALL GEYSERS

PREPARED BY: J. RENNER, G. SHEARER

NAME: OKMOK CALDERA UMNAK I, ALASKA

INPUT RECORD # 6 MIRRORED ON 3/76
NAME: GREAT SITKIN ISLAND, ALASKA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARING FIG: 9 NUMBER: 34 DATE: 02/75

LOCATION:

STATE: ALASKA COUNTY:
LATITUDE: 52 4.00 TOWNSHIP:
LONGITUDE: 176 5.00 RANGE:
ELEV: 2000 SECTION: , 1/4 1/4 B&M:
SURFACE MANIFESTATIONS: FUMAROLE OR WARM VAPOR, HOT SPRING(S),

ROCK AND STRUCTURE TYPE: VOLCANIC, HOLOCENE
SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.1 KM**2
APPROX. # OF HOT SPRINGS: 12

TEMPERATURE: RANGE OF SPRING TEMP. 99 C TO 88 C OR
MAX: WELL TEMP. C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE:

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HCO3
0	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
0.0	0.0	0.0	0.0	0.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 200 C ASSUMED
BEST EST. AVER. TEMP 125.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM;
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.05 TO 0.28 E18 CAL; BEST ESTIMATE 0.15 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1917, 1965; MILLER 1973; SIMONS AND MATHEWSON, 1955; BYERS & BRANNOCK, 1949

TOPO MAPS: ADAK 1:250,000

SPRING IDENTIFIED: NO

COMMENTS:

HOLOCENE VOLCANISM

PREPARED BY: J. RENNER, G. SHEARER

NAME: GREAT SITKIN ISLAND, ALASKA

INPL. RECORD # 7 MIRRORED ON 3/76
NAME: PILGRIM HOT SPRING, ALASKA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WAKING FIG: 9 NUMBER: 6 DATE: 02/75

LOCATION:

STATE: ALASKA COUNTY:
LATITUDE: 65 6.00 TOWNSHIP: 04S
LONGITUDE: 164 55.00 RANGE: 31W
ELEV: 15 SECTION: 36 .SE1/4 SE1/4 H&M: KR

SURFACE MANIFESTATIONS:

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM
SURFACE DISCHARGE TOTAL: 38.0 L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.2 KM**2
APPROX. # OF HOT SPRINGS: SEVERAL

TEMPERATURE: RANGE OF SPRING TEMP. 88 C TO 69 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MILLER AND OTHERS, 1973
SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03
55	38.0	6.75	100.00	1450.00	61.00	530.00	24.0	3346.0	30

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
132.7	137.6	109.2	145.7	119.7

RESERVOIR PROPERTIES

RANGE IN RES TEMP 130 C TO 160 C ASSUMED
BEST EST. AVER. TEMP 150.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.07 TO 0.35 E18 CAL; BEST ESTIMATE 0.18 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MOARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS: AEROMAGNETIC

DEVELOPMENTS: BATH HOUSES, AGRICULTURE

REFERENCES: WARING, 1917, 1965; MILLER, 1973, SAINSBURY AND OTHERS, 1969; MILLER AND OTHERS, 1973

TOPO MAPS: BENDELEBEN (A-6) 1:63,360

SPRING IDENTIFIED: YES

COMMENTS:

.25 KM **2 AREA PERMANENTLY THAWED

PREPARED BY: J. RENNER, G. SHEARER

NAME: PILGRIM HOT SPRING, ALASKA

INPUT RECORD # 8 MIRRORED ON 3/76
NAME: SERPENTINE SPRINGS (ARCTIC), ALASKA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARING FIG: 9 NUMBER: 4 DATE: 02/75

LOCATION:
STATE: ALASKA COUNTY:
LATITUDE: 65 51.00 TOWNSHIP: 05N
LONGITUDE: 164 42.00 RANGE: 25W
ELEV: 400 SECTION: 12, 1/4 1/4 B&M: KR
SURFACE MANIFESTATIONS: SINTER, TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: GRANITE 1 MI FROM FAULT CONTACT WITH PRECAMBRIAN METASED.

SURFACE DISCHARGE TOTAL: 133.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.2 KM**2

APPROX. # OF HOT SPRINGS: 2 MAIN AREAS 1.3 KM APART

TEMPERATURE: RANGE OF SPRING TEMP. 77 C TO

MAX. WELL TEMP. C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MILLER AND OTHERS, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
77	133.0	7.90	90.00	800.00	41.00	75.00	1.0	1450.0	57

OTHER CHEMICAL DATA B 2.9; MG 0.35; F 6

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY		
127.8	131.8	102.7	1/3 161.3	4/3 150.7

RESERVOIR PROPERTIES

RANGE IN RES TEMP 125 C TO 170 C ASSUMED

BEST EST. AVER. TEMP 140.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.07 TO 0.37 E18 CAL; BEST ESTIMATE 0.21 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO DARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS: BATH HOUSE

REFERENCES: SAINSBURY AND OTHERS, 1969; WARING, 1917, 1965; MILLER, BARNES & PATTON, 1973, MILLER, 1973

TOPO MAPS: BENDELEHEN D-6, 1:63,360

SPRING IDENTIFIED: NO

COMMENTS:

TEMP. MAY BE HIGHER THAN 140; NA-K-CA MAY BE INACCURATE DUE TO REPORTED (?) TRAVERTINE DEPOSITION

PREPARED BY: J. RENNER, G. SHEARER

NAME: SERPENTINE SPRINGS (ARCTIC), ALASKA

INPUT RECORD # 9 MIRRORED ON 3/76
NAME: H.S. NEAR LAVA CREEK, ALASKA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 02/75

LOCATION:
STATE: ALASKA COUNTY:
LATITUDE: 65 13.00 TOWNSHIP: 03S
LONGITUDE: 162 54.00 RANGE: 21W
ELEV: 800 SECTION: 1/4 1/4 USM: KRM
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: CONTACT ZONE; QTZ MONZONITE & PRECAMBRIAN MIGMATITE

SURFACE DISCHARGE TOTAL: L/MIN

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 1 PRINCIPAL SPRING

TEMPERATURE: RANGE OF SPRING TEMP. 50 C TO 65 C OR

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/74 SOURCE: MILLER, 1975, UNPUBLISHED DATA

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
50	0.0	8.60	84.00	79.00	1.80	2.00	53.0	5.9	121

OTHER CHEMICAL DATA MG= 0.1; LI 0.13; NH3 < 1; CO3 = 5; F = 10; B = 0.08

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
124.7	128.1	98.6	117.5	90.5

RESERVOIR PROPERTIES

RANGE IN RES TEMP 90 C TO 130 C ASSUMED

BEST EST. AVER. TEMP 125.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT: > 15 C 0.05 TO 0.28 E18 CAL; BEST ESTIMATE 0.15 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MILLER, 1973; MILLER AND OTHERS, 1973

TOPO MAPS: BENDELEBEN A-2 1:63,360

SPRING IDENTIFIED:NO

COMMENTS:

PREPARED BY: G. SHEARER, J. RENNER

NAME: H.S. NEAR LAVA CREEK, ALASKA

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INPUT RECORD # 10 MIRRORED ON 3/76
NAME: H.S. NEAR CLEAR CREEK, ALASKA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARING FIG: NUMBER: DATE: 02/75

LOCATION:
STATE: ALASKA COUNTY:
LATITUDE: 64 51.00 TOWNSHIP:
LONGITUDE: 162 18.00 RANGE:
ELEV: 600 SECTION: 1/4 1/4 B&M:
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: FAULT CONTACT, QUARTZ MONZONITE
SURFACE DISCHARGE TOTAL: 1000.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 2

TEMPERATURE: RANGE OF SPRING TEMP. 60 C TO 67 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/74 SOURCE: MILLER, 1975 UNPUBLISHED DATA
SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
60	0.0	8.33	83.00	55.00	1.60	2.00	27.0	4.2	95

OTHER CHEMICAL DATA MG = 0.1; LI = 0.05; NH3 < 1; CO3 = 6; F = 3.9; B = 0.16

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
124.1	127.5	97.9	122.6	82.4

RESERVOIR PROPERTIES

RANGE IN RES. TEMP. 80 C TO 130 C ASSUMED
BEST EST. AVER. TEMP 125.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.04 TO 0.28 E18 CAL; BEST ESTIMATE 0.15 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:
REFERENCES: MILLER, ET AL, 1973; MILLER, 1973; MILLER ET AL, 1972

TOPO MAPS: SOLOMON D-1 1:63,360

SPRING IDENTIFIED: NO
COMMENTS:

PREPARED BY: G. SHEARER, J. RENNER

NAME: H.S. NEAR CLEAR CREEK, ALASKA

INPUT RECORD # 11 MIRRORED ON 3/76
NAME: GRANITE MTN. (SWEEPSTAKES) ,ALASKA RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 02/75

LOCATION:

STATE: ALASKA COUNTY:
LATITUDE: 65 22.00 TOWNSHIP: 01S
LONGITUDE: 161 15.00 RANGE: 13W
ELEV: 800 SECTION: 25 . 1/4 1/4 B&M: KR
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: IN NEPHELINE SYENITE STOCK NEAR PLUTON

SURFACE DISCHARGE TOTAL: L/MIN

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: SEVERAL

TEMPERATURE: RANGE OF SPRING TEMP. 49 C TO

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MILLER, 1973, 1975 (UNPUBLISHED DATA)

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
49	0.0	10.14	75.00	51.00	1.30	2.00	62.0	9.3	46

OTHER CHEMICAL DATA MG 0.04; LI 0.04

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY		
119.6	122.2	92.0	1/3 116.2	4/3 74.8

RESERVOIR PROPERTIES

RANGE IN RES TEMP 75 C TO 135 C ASSUMED

BEST EST. AVER. TEMP 130.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.04 TO 0.29 E18 CAL; BEST ESTIMATE 0.16 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MILLER, BARNES & PATTON, 1973, MILLER 1973

TOPO MAPS: CANDLE B-5 1:63,360

SPRING IDENTIFIED:NO

COMMENTS:

PREPARED BY: J. RENNER, G. SHEARER

NAME: GRANITE MTN. (SWEEPSTAKES) , ALASKA

INF , RECORD # 12 MIRRORED ON 3/76
NAME: SOUTH ,ALASKA RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 02/75

LOCATION:
STATE: ALASKA COUNTY:
LATITUDE: 66 9.00 TOWNSHIP: 10N
LONGITUDE: 157 7.00 RANGE: 06E
ELEV: 800 SECTION: . 1/4 1/4 B&M: KR
SURFACE MANIFESTATIONS: HOT SPRING(S),

ROCK AND STRUCTURE TYPE: QUARTZ MONZONITE
SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: SEVERAL

TEMPERATURE: RANGE OF SPRING TEMP. 50 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MILLER, 1973, 1975 (UNPUBLISHED)

SPRING FLOW

TEMP	L/MIN	PH	SiO2	NA	K	CA	SO4	CL	HC03
0	0.0	0.00	65.00	83.00	2.10	5.90	122.0	60.0	0

OTHER CHEMICAL DATA MG .01

SiO2	SiO2	SiO2	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
113.4	114.9	84.0	115.2	72.3

RESERVOIR PROPERTIES

RANGE IN RES TEMP 70 C TO 125 C ASSUMED

BEST EST. AVER. TEMP 120.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.03 TO 0.26 E18 CAL; BEST ESTIMATE 0.14 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MILLER, BARNES & PATTON, 1973; MILLER 1973

TOPO MAPS: SHUNGNAK 1:250000

SPRING IDENTIFIED: NO

COMMENTS:

PREPARED BY: J. RENNER, G. SHEARER

NAME: SOUTH , ALASKA

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INPUT RECORD # 13 MIRRORED ON 3/76
NAME: MELOZI (MELOZITNA) H.S. ,ALASKA RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 9 NUMBER: 10 DATE: 02/75

LOCATION:
STATE: ALASKA COUNTY:
LATITUDE: 65 8.00 TOWNSHIP: 04S
LONGITUDE: 154 40.00 RANGE: 20E
ELEV: 900 SECTION: 23 . 1/4 1/4 B&M: KR
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: QUARTZ MONZONITE
SURFACE DISCHARGE TOTAL: 494.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: ONE MAIN SPRING

TEMPERATURE: RANGE OF SPRING TEMP. 55 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: WARING, 1917
SPRING FLOW
TEMP L/MIN PH SI02 NA K CA SO4 CL MC03
55 494.0 0.00 78.00 0.00 0.00 11.00 61.0 92.0 32

OTHER CHEMICAL DATA MG 2.8, NA+K = 107
SI02 SI02 SI02 NA_K_CA OTHER
ADIABATIC CONDUCTIVE CHALCEDONY 1/3 4/3
121.4 124.2 94.2 0.0 0.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 90 C TO 135 C ASSUMED
BEST EST. AVER. TEMP 130.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.05 TO 0.29 E18 CAL; BEST ESTIMATE 0.16 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1917, 1965; MILLER, BARNES & PATTON, 1973; MILLER, 1973

TOPO MAPS: MELOZITNA A-4 1:63,360

SPRING IDENTIFIED: YES

COMMENTS:

GEOCHEMISTRY NOT RELIABLE

PREPARED BY: J. RENNER, G. SHEARER

NAME: MELOZI (MELOZITNA) H.S. , ALASKA

2.9

INJECT RECORD # 14 MIRRORED ON 3/76
NAME: LITTLE MELOZITNA, ALASKA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 9 NUMBER: 11 DATE: 02/75

LOCATION:

STATE: ALASKA COUNTY:
LATITUDE: 65 28.00 TOWNSHIP: 01N
LONGITUDE: 153 19.00 RANGE: 27E
ELEV: 900 SECTION: 1/4 1/4 8&M: KR
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: GRANITIC PLUTON
SURFACE DISCHARGE TOTAL: 230.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 5
TEMPERATURE: RANGE OF SPRING TEMP. 38 C TO
MAX. WELL TEMP C AT M DEPTH: BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00. SOURCE: WARING, 1917

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
0	0.0	0.00	80.00	0.00	0.00	0.00	0.0	0.0	0

OTHER CHEMICAL DATA SI02 APPROXIMATE

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
122.5	125.5	95.7	0.0	0.0

RESERVOIR PROPERTIES

RANGE IN RES. TEMP 95 C TO 135 C ASSUMED
BEST EST. AVER. TEMP 130.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.05 TO 0.29 E18 CAL; BEST ESTIMATE 0.16 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS: BATH HOUSE

REFERENCES: WARING, 1917, 1965; MILLER, BARNES & PATTON 1973; MILLER 1973

TOPO MAPS: MELOZITNA B-1, 1:63,360

SPRING IDENTIFIED: YES

COMMENTS:

GEOCHEMISTRY APPROXIMATE

PREPARED BY: J. RENNER, G. SHEARER

NAME: LITTLE MELOZITNA, ALASKA

INPUT RECORD # 15 MIRRORED ON 3/76
NAME: KANUTI, ALASKA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WAKING FIG: NUMBER: DATE: 02/75

LOCATION:
STATE: ALASKA COUNTY:
LATITUDE: 66 20.00 TOWNSHIP: 18N
LONGITUDE: 150 48.00 RANGE: 15W
ELEV: 950 SECTION: 36 . 1/4 1/4 BLM: F
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: MAFIC VOLCANICS
SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: SEVERAL

TEMPERATURE: RANGE OF SPRING TEMP. 66 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MILLER ET AL. 73
SPRING FLOW
TEMP L/MIN PH SI02 NA K CA SO4 CL HC03
66 0.0 8.01 0.00 111.00 3.70 2.70 21.0 28.0 169

OTHER CHEMICAL DATA B 1.3; MG .3
SI02 ADIABATIC SI02 CONDUCTIVE SI02 CHALCEDONY NA_K_CA OTHER
0.0 0.0 0.0 1/3 4/3
136.2 114.1

RESERVOIR PROPERTIES
RANGE IN RES TEMP 100 C TO 145
BEST EST. AVER. TEMP 140.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.05 TO 0.31 E18 CAL; BEST ESTIMATE 0.17 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:
DEVELOPMENTS:
REFERENCES: MILLER BARNES & PATTON 1973; MILLER 1973

TOPO MAPS: BETTLES 1:250000

SPRING IDENTIFIED:NO
COMMENTS:

PREPARED BY: G. SHEARER, J. RENNER

NAME: KANUTI, ALASKA

IN 1 RECORD # 16 MIRRORED ON 3/76
NAME: MANLEY H.S. (BAKER) ALASKA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARING FIG: 9 NUMBER: 14 DATE: 02/75

LOCATION:

STATE: ALASKA COUNTY:
LATITUDE: 65 0.00 TOWNSHIP: 02N
LONGITUDE: 150 38.00 RANGE: 15W
ELEV: 350 SECTION: 17, 1/4 NE1/4 B&M: F

SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: METASEDIMENTS WITH GRANITIC INTRUSIVE

SURFACE DISCHARGE TOTAL: 560.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP. 56 C TO 59 C OR

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MILLER ET AL, 73

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
56	560.0	7.72	65.00	130.00	4.50	4.00	54.0	134.0	90

OTHER CHEMICAL DATA B 1.3; MG 1; LI .28; F 8.5; NH4 4.9

SI02	ADIAHATIC	CONDUCTIVE	SI02	CHALCEDONY	1/3	NA_K_CA	4/3	OTHER
113.4	113.4	114.9	84.0	137.4	113.5			

RESERVOIR PROPERTIES

RANGE IN RES TEMP 80 C TO 150 C ASSUMED

BEST EST. AVER. TEMP 140.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.04 TO 0.32 E18 CAL; BEST ESTIMATE 0.17 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS: AGRICULTURE, BATH HOUSE

REFERENCES: WARING, 1917, 1965; MILLER, 1973; MILLER, BARNES & PATTON, 1973

TOPO MAPS: TANANA A-2, 1:63,360

SPRING IDENTIFIED: YES

COMMENTS:

PREPARED BY: G. SHEARER, J. RENNER

NAME: MANLEY H.S. (BAKER) ALASKA

INPUT RECORD # 17 MIRRORED ON 3/76
NAME: TOLOVANA, ALASKA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 02/75
LOCATION:

STATE: ALASKA COUNTY:
LATITUDE: 65 16.00 TOWNSHIP: 05N
LONGITUDE: 148 50.00 RANGE: 06W
ELEV: 975 SECTION: 7 . 1/4 SE1/4 B&M: F
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: MUDSTONE INTRUDED BY GRANITIC RX
SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: SEVERAL

TEMPERATURE: RANGE OF SPRING TEMP. 60 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/70 SOURCE: ANDERSON, 1970

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	MC03
60	0.0	7.70	75.00	321.00	23.00	82.00	40.0	615.0	49

OTHER CHEMICAL DATA MG L.2; F .2

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
119.6	122.2	92.0	162.1	110.4

RESERVOIR PROPERTIES

RANGE IN RES TEMP 115 C TO 170 C ASSUMED

BEST EST. AVER. TEMP 130.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.06 TO 0.37 E18 CAL; BEST ESTIMATE 0.16 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1917, 1965, MILLER 1973; MILLER, BARNES & PATTON 1973; ANDERSON, 1970; CHAPMAN AND OTHERS, 1971

TOPO MAPS: LIVENGOD B-4, 1:63,360

SPRING IDENTIFIED: YES

COMMENTS:

TRAVERTINE? NA-K-CA MUCH HIGHER THAN SI02; SMALL FLOW FROM SPRING

PREPARED BY: G. SHEARER, J. RENNER

NAME: TOLOVANA, ALASKA

INPUT RECORD # 18 MIRRORED ON 3/76
NAME: CHENA, ALASKA RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 9 NUMBER: 18 DATE: 02/75

LOCATION:

STATE: ALASKA

COUNTY:

LATITUDE: 65 3.00 TOWNSHIP: 03N

LONGITUDE: 146 3.00 RANGE: 08E

ELEV: 1300 SECTION: , 1/4 1/4 B&M: F

SURFACE MANIFESTATIONS: OTHER SPRING DEPOSITS, HOT SPRING(S),

ROCK AND STRUCTURE TYPE: GRANITIC RK INTRUDING SCHIST

SURFACE DISCHARGE TOTAL: 840.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 10

TEMPERATURE: RANGE OF SPRING TEMP. 57 C TO

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MILLER, 73

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
57	840.0	9.14	85.00	110.00	3.30	1.30	68.0	29.0	115

OTHER CHEMICAL DATA B 1.3; MG .13; LI .3; F 18.6; NH4 2.7

SI02	SI02	SI02	NA_K_CA	OTHER
AUIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
125.2	128.7	99.3	136.8	129.3

RESERVOIR PROPERTIES

RANGE IN RES TEMP 125 C TO 150 C ASSUMED

BEST EST. AVER. TEMP 140.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.07 TO 0.32 E18 CAL; BEST ESTIMATE 0.17 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS: BATH HOUSE, AGRICULTURE

REFERENCES: WARING, 1917, 1965; MILLER, 1973

TOPO MAPS: CIRCLE A-5, 1:63,360

SPRING IDENTIFIED: YES

COMMENTS:

SULFUR DEPOSITION

PREPARED BY: G. SHEARER, J. RENNER

NAME: CHENA, ALASKA

INPUT RECORD # 19 MIRRORED ON 3/76
NAME: CIRCLE, ALASKA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARING FIG: 9 NUMBER: 19 DATE: 02/75

LOCATION:

STATE: ALASKA COUNTY:
LATITUDE: 65 29.00 TOWNSHIP: 08N
LONGITUDE: 144 39.00 RANGE: 15E
ELEV: 900 SECTION: 34 . 1/4 1/4 8&M: F
SURFACE MANIFESTATIONS: SINTER, TRAVERTINE, OTHER SPRING DEPOSITS, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: SCHIST WITH GRANITIC INTRUSIONS
SURFACE DISCHARGE TOTAL: 494.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 11

TEMPERATURE: RANGE OF SPRING TEMP. 54 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MILLER, 73

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
54	494.0	7.60	95.00	230.00	9.80	20.80	96.0	249.0	185

OTHER CHEMICAL DATA B 1.1; LI .34; MG .3; F 9.7; NH4 .1

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
130.3	134.7	106.0	142.9	108.5

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 150 C ASSUMED

BEST EST. AVER. TEMP 145.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.05 TO 0.32 E18 CAL; BEST ESTIMATE 0.18 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS: AGRICULTURE, BATH HOUSE

REFERENCES: WARING, 1917, 1965; MILLER, 1973

TOPO MAPS: CIRCLE B-2, 1:63,360

SPRING IDENTIFIED:NO

COMMENTS:

PREPARED BY: J. RENNER, G. SHEARER

NAME: CIRCLE, ALASKA

INPUT RECORD # 20 MIRRORED ON 3/76
NAME: E. COLD BAY, ALASKA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 02/75

LOCATION:
STATE: ALASKA COUNTY:
LATITUDE: 55 13.00 TOWNSHIP:
LONGITUDE: 162 29.00 RANGE:
ELEV: 0 SECTION: , 1/4 1/4 8&M:
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: HOLOCENE VOLCANICS
SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP. 54 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MILLER 73

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03
54	0.0	7.50	68.00	780.00	34.00	229.00	0.0	1390.0	694

OTHER CHEMICAL DATA B 32; MG 7.0; LI 1.5; F 0.1

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
115.4	117.2	86.5	144.3	110.5

RESERVOIR PROPERTIES

RANGE IN RES TEMP 90 C TO 155 C ASSUMED

BEST EST. AVER. TEMP 145.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.05 TO 0.34 E18 CAL; BEST ESTIMATE 0.18 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MILLER, 1973

TOPO MAPS: COLD BAY 1:250,000

SPRING IDENTIFIED: NO

COMMENTS:

PREPARED BY: J. RENNER, G. SHEARER

NAME: E. COLD BAY, ALASKA

RECORD # 21 MIRRORED ON 3/76
NAME: NEAR N. END TENAKEE INLET, ALASKA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 9 NUMBER: 64 DATE: 02/75

LOCATION:
STATE: ALASKA COUNTY:
LATITUDE: 58 0.00 TOWNSHIP: 44S
LONGITUDE: 135 55.00 RANGE: 59E
ELEV: 0 SECTION: 1/4 1/4 8&M: CR
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: DIORITE INTRUSIVE IN GRANITE
SURFACE DISCHARGE TOTAL: 38.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 12

TEMPERATURE: RANGE OF SPRING TEMP. 82 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM-HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: WARING, 1917
SPRING FLOW
TEMP L/MIN PH SI02 NA K CA S04 CL HC03
82 38.0 0.00 119.00 137.00 4.10 21.00 226.0 33.0 48

OTHER CHEMICAL DATA MG 2.3
SI02 SI02 SI02 NA_K_CA OTHER
ADIABATIC CONDUCTIVE CHALCEDONY 1/3 4/3
141.1 147.5 120.4 120.1 72.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 70 C TO 155 C ASSUMED
BEST EST. AVER. TEMP 150.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.03 TO 0.34 E18 CAL; BEST ESTIMATE 0.18 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1917, 1965; MILLER, 1973

TOPO MAPS: JUNEAU A-6, 1:63,360

SPRING IDENTIFIED:NO

COMMENTS:

MAY BE ON JUNEAU A-6; LAT AND LONG UNCERTAIN

PREPARED BY: G. SHEARER, J. RENNER

NAME: NEAR N. END TENAKEE INLET, ALASKA

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IN RECORD # 22 MIRRORED ON 3/76
NAME: HOONIAH H.S. (WHITE SULPHUR SPRINGS), ALASKA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARING FIG: 9 NUMBER: 65 DATE: 02/75

LOCATION:

STATE: ALASKA COUNTY:
LATITUDE: 57 48.00 TOWNSHIP: 47S
LONGITUDE: 136 20.00 RANGE: 56E
ELEV: 40 SECTION: 9 1/4 1/4 H&M: CR
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: SCHIST
SURFACE DISCHARGE TOTAL: 114.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 3

TEMPERATURE: RANGE OF SPRING TEMP. 44 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: WARING, 17

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
44	114.0	0.00	98.00	0.00	0.00	85.00	35.0	42.0	18

OTHER CHEMICAL DATA NA+K=59

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
131.8	136.4	107.9	0.0	0.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 150 C ASSUMED
BEST EST. AVER. TEMP 140.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.05 TO 0.32 E18 CAL; BEST ESTIMATE 0.17 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS: BATHING

REFERENCES: WARING, 1917, 1965; MILLER, 1973

TOPO MAPS: SITKA D-8, 1:63,360

SPRING IDENTIFIED: YES

COMMENTS:

GEOCHEMISTRY MAY NOT BE ACCURATE

PREPARED BY: G. SHEARER, J. RENNER

NAME: HOONIAH H.S. (WHITE SULPHUR SPRINGS), ALASKA

INR RECORD # 23 MIRRORED ON 3/76
NAME: TENAKEE H.S. ALASKA RESOURCE CATEGORY: HOT WATER 9. TO 150 C
WARING FIG: 9 NUMBER: 67 DATE: 02/75
LOCATION:

STATE: ALASKA COUNTY:
LATITUDE: 57 47.00 TOWNSHIP: 47S
LONGITUDE: 135 13.00 RANGE: 63E
ELEV: 0 SECTION: 1/4 1/4 B&M: CR
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: DIORITE INTRUSIVE
SURFACE DISCHARGE TOTAL: 84.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 12

TEMPERATURE: RANGE OF SPRING TEMP. 41 C TO 43 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MILLER, 73

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
43	0.0	9.00	60.00	190.00	3.30	28.00	322.0	95.4	55

OTHER CHEMICAL DATA B 4.4; MG 0.76; LI 0.08; F 5

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
110.0	111.0	79.7	101.4	62.8

RESERVOIR PROPERTIES

RANGE IN RES TEMP 60 C TO 120 C ASSUMED

BEST EST. AVER. TEMP 115.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.03 TO 0.25 E18 CAL; BEST ESTIMATE 0.14 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS: RESORT

REFERENCES: WARING, 1917, 1965; MILLER 1973

TOPO MAPS: SITKA D-4, 1:63,360

SPRING IDENTIFIED:NO

COMMENTS:

PREPARED BY: G. SHEARER, J. RENNER

NAME: TENAKEE H.S. ALASKA

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INR RECORD # 24 MIRRORED ON 3/76
NAME: H.S. NEAR FISH BAY, ALASKA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARING FIG: 9 NUMBER: 68 DATE: 02/75
LOCATION:

STATE: ALASKA COUNTY:
LATITUDE: 57 22.00 TOWNSHIP:
LONGITUDE: 135 23.00 RANGE:
ELEV: 0 SECTION: 1/4 1/4 B&M: CR
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: SCHIST NEAR FAULT
SURFACE DISCHARGE TOTAL: 95.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 24

TEMPERATURE: RANGE OF SPRING TEMP. 47 C TO

MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH
CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: WARING, 1917

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
47	0.0	0.00	110.00	0.00	0.00	13.00	24.0	45.0	43

OTHER CHEMICAL DATA B 10.1; MG 2.4; NA+K=69

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
137.2	142.9	115.2	0.0	0.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 115 C TO 155 C ASSUMED

BEST EST. AVER. TEMP 150.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.06 TO 0.34 E18 CAL; BEST ESTIMATE 0.18 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1917, 1965; MILLER 1973

TOPO MAPS: SITKA B-5, 1:63,360

SPRING IDENTIFIED: YES

COMMENTS:

PREPARED BY: G. SHEARER, J. RENNER

NAME: H.S. NEAR FISH BAY, ALASKA

INH RECORD # 25 MIRRORED ON 3/76
NAME: BARANOF H.S., ALASKA RESOURCE CATEGORY: HOT WATER 9. TO 150 C
WARING FIG: 9 NUMBER: 69 DATE: 02/75
LOCATION:

STATE: ALASKA COUNTY:
LATITUDE: 57 5.00 TOWNSHIP:
LONGITUDE: 134 50.00 RANGE:
ELEV: 0 SECTION: 1/4 1/4 B&M: CR
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: FAULTED DIORITE
SURFACE DISCHARGE TOTAL: 304.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 9

TEMPERATURE: RANGE OF SPRING TEMP. 50 C TO 51 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MILLER, 73
SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
51	0.0	9.60	70.00	51.00	1.20	2.50	68.0	11.0	88

OTHER CHEMICAL DATA B 0.2; MG .14; LI 0.06; F 1.2

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
116.6	118.6	88.1	111.6	67.7

RESERVOIR PROPERTIES

RANGE IN RES TEMP 65 C TO 130 C ASSUMED

BEST EST. AVER. TEMP 125.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.03 TO 0.28 E18 CAL; BEST ESTIMATE 0.15 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS: BATH HOUSE, CABINS

REFERENCES: WARING, 1917, 1965; MILLER, 1973

TOPO MAPS: SITKA A-3, 1:63,360

SPRING IDENTIFIED: YES

COMMENTS:

PREPARED BY: G. SHEARER, J. RENNER

NAME: BARANOF H.S., ALASKA

INPI RECORD # 26 MIRRORED ON 3/76
NAME: GODDARD H.S., ALASKA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 9 NUMBER: 70 DATE: 02/75

LOCATION:

STATE: ALASKA

COUNTY:

LATITUDE: 56 50.00 TOWNSHIP: 58S

LONGITUDE: 135 22.00 RANGE: 64E

ELEV: 0 SECTION: , 1/4 1/4 B&M: CR

SURFACE MANIFESTATIONS: HOT SPRING(S),

ROCK AND STRUCTURE TYPE: GRANITE CUT BY DIABASE DIKE
SURFACE DISCHARGE TOTAL: 49.4 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 3

TEMPERATURE: RANGE OF SPRING TEMP. 65 C TO

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MILLER, 73

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
67	49.4	7.37	120.00	1500.00	61.00	380.00	110.0	2780.0	8

OTHER CHEMICAL DATA B 1.1; MG 1; LI 1.6; F 1.4

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
141.5	147.9	120.9	147.2	129.4

RESERVOIR PROPERTIES

RANGE IN RES TEMP 120 C TO 155 C ASSUMED

BEST EST. AVER. TEMP 150.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.06 TO 0.34 E18 CAL; BEST ESTIMATE 0.18 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MOARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS: BATHING RESORT

REFERENCES: WARING, 1917, 1965; MILLER 1973

TOPO MAPS: PORT ALEXANDER D-5, 1:63,360

SPRING IDENTIFIED:NO

COMMENTS:

PREPARED BY: G. SHEARER, J. RENNER

NAME: GODDARD H.S., ALASKA

INA RECORD # 27 MIRRORED ON 3/76
NAME: BAILEY H.S. ALASKA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 9 NUMBER: 76 DATE: 02/75

LOCATION:

STATE: ALASKA COUNTY:
LATITUDE: 55 59.00 TOWNSHIP: 68S
LONGITUDE: 131 39.50 RANGE: 89E
ELEV: 0 SECTION: 1/4 1/4 B&M: CR
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: GRANITE
SURFACE DISCHARGE TOTAL: 315.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 9

TEMPERATURE: RANGE OF SPRING TEMP. 88 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: WARING, 1917

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
85	0.0	0.00	142.00	0.00	0.00	13.00	32.0	11.0	27

OTHER CHEMICAL DATA MG 2.1: NA+K=54

SI02	SI02	SI02	NA_K_CA	OTHER
ADIAHATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
149.9	158.0	132.4	0.0	0.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 130 C TO 170 C ASSUMED
BEST EST. AVER. TEMP 150.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON:
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C. 0.07 TO 0.37 E18 CAL; BEST ESTIMATE 0.18 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS: BATHING
REFERENCES: WARING, 1917, 1965; MILLER 1973

TOPO MAPS: KETCHIKAN D-5, 1:63,360

SPRING IDENTIFIED: YES

COMMENTS:
GEOTHERMOMETRY MAY NOT BE RELIABLE

PREPARED BY: G. SHEARER, J. RENNER

NAME: BAILEY H.S. ALASKA

INPUT RECORD # 28 MIRRORED ON 3/76
NAME: BELL ISLAND H.S. ,ALASKA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 9 NUMBER: 79 DATE: 02/75

LOCATION:

STATE: ALASKA COUNTY:
LATITUDE: 55 56.00 TOWNSHIP:
LONGITUDE: 131 34.00 RANGE:
ELEV: 0 SECTION: , 1/4 1/4 B&M:
SURFACE MANIFESTATIONS: HOT SPRING(S),

ROCK AND STRUCTURE TYPE: GRANITIC INTRUSIVE
SURFACE DISCHARGE TOTAL: 38.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 5

TEMPERATURE: RANGE OF SPRING TEMP. 72 C TO

MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: WARING, 17

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
72	0.0	0.00	105.00	0.00	0.00	4.60	129.0	4.6	37

OTHER CHEMICAL DATA MG L.0; NA+K=201

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY		
135.0	140.3	112.3	1/3 0.0	4/3 0.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 110 C TO 150 C ASSUMED

BEST EST. AVER. TEMP 145.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.06 TO 0.32 E18 CAL; BEST ESTIMATE 0.17 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MOARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS: BATH HOUSE

REFERENCES: WARING, 1917, 1965; MILLER 1973

TOPO MAPS: KETCHIKAN, D-S, 1:63,360

SPRING IDENTIFIED: YES

COMMENTS:

PREPARED BY: G. SHEARER, J. RENNER

NAME: BELL ISLAND H.S. , ALASKA

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of the world--A summary: U.S. Geol. Survey Prof. Paper 492,
383 p.

Selected Geothermal Resources Assessment Data

Hydrothermal Convection Systems in Arizona

By: J. P. Calzia, Menlo Park, California

J. L. Renner, Denver, Colorado

and

K. E. Telleen, Menlo Park, California

Contents

Hot-Spring Data Sheets

Hot water greater than 150°C

Hot water from 90° to 150°C

References

IN RECORD # 29 MIRRORED ON 3/76
NAME: POWER RANCHES INC. WELLS ,AZ RESOURCE CATAGORY: HOT WATER > 150 C
WARNING FIG: NUMBER: DATE: 05/75

LOCATION:

STATE: AZ COUNTY: MARICOPA
LATITUDE: 33 17.10 TOWNSHIP: 02S
LONGITUDE: 111 41.20 RANGE: 06E
ELEV: 1340 SECTION: 1 ,SW1/4 1/4 B&M: G&SR
SURFACE MANIFESTATIONS: FOUND BY DRILLING

ROCK AND STRUCTURE TYPE: VOLCANICS (AGE?)
SURFACE DISCHARGE TOTAL: 19000.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP.

MAX. WELL TEMP 184 C AT 3200 M DEPTH

BOTTOM HOLE TEMP. 184 C AT 3200 M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE:

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HCO3
0	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
0.0	0.0	0.0	0.0	0.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 163 C TO 184 MEASURED

BEST EST. AVER. TEMP 180.0

AREA 1.0 TO 5.0 KM**2; BEST ESTIMATE 2.5 KM**2

BASED ON DRILLING

DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 2.00 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.00 KM.

VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.50 KM**3

HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.20 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS: 2 WELLS OF ABOUT 3KM DEPTH

REFERENCES: PERS. COMM. MR MIKE O DONNELL & MR. WARD AUSTIN OF GEOTHERMAL KINETICS

TOPO MAPS: HIGLEY 1:24,000

SPRING IDENTIFIED: NO

COMMENTS:

WELLS ARE RATED AS GEOTHERMAL PRODUCERS. RESERVOIR SIZE CONFIDENTIAL. BOTTOM HOLE TEMPS 163 AND 184C; PRODUCIN G INTERVAL 2-3KM DEPTH.

PREPARED BY: J. RENNER

NAME: POWER RANCHES INC. WELLS . AZ

INP RECORD # 30 MIRRORED ON 3/76
NAME: VERDE HOT SPRINGS, AZ RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 2 NUMBER: 6 DATE: 05/75

LOCATION:
STATE: AZ COUNTY: YAVAPAI
LATITUDE: 34 21.50 TOWNSHIP:
LONGITUDE: 111 42.50 RANGE:
ELEV: 2670 SECTION: 1/4 1/4 B&M:
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: TERTIARY(?) VOLCANICS
SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 3

TEMPERATURE: RANGE OF SPRING TEMP. 36 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH
CHEMICAL DATA ANALYSIS DATE 12/74 SOURCE: MARINER 1975, UNPUBLISHED

SPRING FLOW											
TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03		
36	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0	

OTHER CHEMICAL DATA SI02 TEMP 118; NA-K-CA, 146C
SI02 NA_K_CA OTHER
ADIABATIC CONDUCTIVE CHALCEDONY 1/3 4/3
0.0 0.0 0.0 0.0 0.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 115 C TO 150 C ASSUMED
BEST EST. AVER. TEMP 150.0
AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.20 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS: GRAVITY, MAG
DEVELOPMENTS:

REFERENCES: MARINER, 1975; SAUCK AND SUMNER, 1970; WEST AND SUMNER 1973; FORRESTER, 1962

TOPO MAPS: VERDE HOT SPRINGS 1:24,000

SPRING IDENTIFIED: YES

COMMENTS:

EQUILIBRIUM WITH CALCITE AND AMORPHOUS SILICA AT SPRING TEMP. GEOTHERMOMETRY MAY BE HIGH

PREPARED BY: CALZIA, RENNER

NAME: VERDE HOT SPRINGS, AZ

INR RECORD # 31 MIRRORED ON 3/76
NAME: CASTLE HOT SPRINGS, AZ RESOURCE CATEGORY: HOT WATER U TO 150 C
WARNING FIG: 2 NUMBER: 8 DATE: 05/75

LOCATION:

STATE: AZ COUNTY: YAVAPAI
LATITUDE: 33 59.10 TOWNSHIP: 08N
LONGITUDE: 112 21.60 RANGE: 01W
ELEV: 1980 SECTION: 34 SW1/4 SW1/4 B&M: G&SR

SURFACE MANIFESTATIONS:

ROCK AND STRUCTURE TYPE: MESOZOIC-TERTIARY INTRUSIVE & VOLCANIC ROCKS

SURFACE DISCHARGE TOTAL: L/MIN

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 2

TEMPERATURE: RANGE OF SPRING TEMP. 46 C TO 50 C OR

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 12/74 SOURCE: MARINER, 1975

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
0	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0

OTHER CHEMICAL DATA TEMP: SI02, 109; NA-K-CA, 71

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
0.0	0.0	0.0	0.0	0.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 70 C TO 120 C ASSUMED

BEST EST. AVER. TEMP 110.0

AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.10 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS: GRAVITY, MAG

DEVELOPMENTS:

REFERENCES: HAIGLER, 1969; MARINER, 1975; FORRESTER, 1962; SAUCK & SUMNER 1970; WEST & SUMNER 1973; WARING, 1965

TOPO MAPS: GOVERNORS PEAK 1:24,000

SPRING IDENTIFIED: YES

COMMENTS:

PREPARED BY: CALZIA - RENNER

NAME: CASTLE HOT SPRINGS, AZ

INFO RECORD # 32 MIRRORED ON 3/76
NAME: HOT SPRING N. OF CLIFTON, AZ RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 05/75

LOCATION:

STATE: AZ COUNTY: GREENLEE
LATITUDE: 33 4.70 TOWNSHIP: 04S
LONGITUDE: 109 18.20 RANGE: 30E
ELEV: 3500 SECTION: 18 SW1/4 SW1/4 B&M: G&SR
SURFACE MANIFESTATIONS:

ROCK AND STRUCTURE TYPE: FAULTED PALEOZOIC CARBONATES & TERTIARY VOLCANICS

SURFACE DISCHARGE TOTAL: L/MIN

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 2

TEMPERATURE: RANGE OF SPRING TEMP. 44 C TO 59 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 12/74 SOURCE: MARINER, 1975

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	MC03
59	0.0	0.00	100.00	2600.00	170.00	740.00	0.0	0.0	0

OTHER CHEMICAL DATA MG = 20

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
132.7	137.6	109.2	174.4	164.9

RESERVOIR PROPERTIES

RANGE IN RES TEMP 130 C TO 175 C ASSUMED

BEST EST. AVER. TEMP 140.0

AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.20 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS: GRAVITY, MAG

DEVELOPMENTS:

REFERENCES: SAUCK & SUMNER, 1970; WEST & SUMNER, 1973; LINDGREN, 1905; MARINER, 1975

TOPO MAPS: CLIFTON 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

MAY BE CALCITE PPT.

PREPARED BY: CALZIA & RENNER

NAME: HOT SPRING N. OF CLIFTON, AZ

INFO RECORD # 33 MIRRORED ON 3/76
NAME: CLIFTON HOT SPRINGS, AZ RESOURCE CATEGORY: HOT WATER 70 TO 150 C
WARNING FIG: 2 NUMBER: 17 DATE: 05/75

LOCATION:

STATE: AZ COUNTY: GREENLEE
LATITUDE: 33 3.20 TOWNSHIP: 04S
LONGITUDE: 109 17.80 RANGE: 30E
ELEV: 3520 SECTION: 30, NW1/4 SE1/4 B&M: G&SR
SURFACE MANIFESTATIONS: HOT SPRING(S),

ROCK AND STRUCTURE TYPE: TERTIARY VOLCANICS
SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 1

TEMPERATURE: RANGE OF SPRING TEMP. 39 C TO 75 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 12/74 SOURCE: MARINER 1975

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
39	0.0	0.00	55.00	1500.00	82.00	430.00	0.0	0.0	0

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
106.4	106.8	75.1	160.5	138.7

RESERVOIR PROPERTIES

RANGE IN RES TEMP 105 C TO 165 C ASSUMED
BEST EST. AVER. TEMP 110.0
AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.10 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

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GEOPHYSICAL SURVEYS: GRAVITY, MAG

DEVELOPMENTS:

REFERENCES: HARSHBARGER, 1972; LINDGREN, 1905; EVERIT, 1925; HEM, 1950; WARING, 1965; MARINER, 1975; SAUCK AND SUMNER, 1970; WEST AND SUMNER 1973

TOPO MAPS: CLIFTON 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

MAY BE CALCITE PRECIPITATION

PREPARED BY: CALZIA & RENNER

NAME: CLIFTON HOT SPRINGS, AZ

INP RECORD # 34 MIRRORED ON 3/76
NAME: EAGLE CREEK SPRING, AZ RESOURCE CATEGORY: HOT WATER TO 150 C
WARNING FIG: 2 NUMBER: 167 DATE: 05/75

LOCATION:

STATE: AZ COUNTY: GREENLEE
LATITUDE: 33 2.80 TOWNSHIP: 04S
LONGITUDE: 109 28.60 RANGE: 28E
ELEV: 3680 SECTION: 35, NW1/4 NE1/4 B&M: G&SR
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: FAULTED TERTIARY(?) BASALT
SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 2

TEMPERATURE: RANGE OF SPRING TEMP. 32 C TO 36 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 12/74 SOURCE: MARINER, 1975
SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
36	0.0	8.31	0.00	0.00	0.00	0.00	0.0	0.0	0

OTHER CHEMICAL DATA TEMP: SI02, 144; NA-K-CA, 104

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
0.0	0.0	0.0	0.0	0.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 115 C ASSUMED

BEST EST. AVER. TEMP 115.0

AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.10 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS: GRAVITY, MAG

DEVELOPMENTS:

REFERENCES: LINDGREN, 1905; MARINER 1975; WEST & SUMNER, 1973; SAUCK & SUMNER, 1970

TOPO MAPS: CLIFTON 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

MAY HAVE NON QUARTZ SILICA CONTROL

PREPARED BY: CALZIA & RENNER

NAME: EAGLE CREEK SPRING, AZ

INPUT RECORD # 35 MIRRORED ON 3/76
NAME: GILLARD HOT SPRINGS, AZ RESOURCE CATEGORY: HOT WATER 10 TO 150 C
WARNING FIG: NUMBER: DATE: 05/75

LOCATION:

STATE: AZ COUNTY: GREENLEE
LATITUDE: 32 58.50 TOWNSHIP: 05S
LONGITUDE: 109 21.00 RANGE: 29E
ELEV: 3360 SECTION: 27, NE1/4 NE1/4 B&M: G&SR
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: FAULTED TERTIARY BASALTS WITH INTERBEDDED FANGLOMERATES

SURFACE DISCHARGE TOTAL: L/MIN

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 5

TEMPERATURE: RANGE OF SPRING TEMP. 82 C TO

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 12/74 SOURCE: MARINER 1975

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
82	0.0	0.00	95.00	450.00	14.00	22.00	0.0	0.0	0

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
130.3	134.7	106.0	138.4	130.5

RESERVOIR PROPERTIES

RANGE IN RES TEMP 130 C TO 140 C ASSUMED

BEST EST. AVER. TEMP 140.0

AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.20 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS: GRAVITY, MAG

DEVELOPMENTS:

REFERENCES: MARINER, 1975; WARING, 1965; HEM, 1950; SAUCK AND SUMNER, 1970; WEST AND SUMNER, 1973

TOPO MAPS: GUTHRIE 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

MAY BE ALPHA CRISTOBALITE RATHER THAN QTZ EQUI.

PREPARED BY: CALZIA & RENNER

NAME: GILLARD HOT SPRINGS, AZ

INPUT: DORD # 36 MIRRORED ON 3/76
NAME: MT. GRAHAM HOT MINERAL WELL .AZ RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 05/75

LOCATION:

STATE: AZ COUNTY: GRAHAM
LATITUDE: 32 51.40 TOWNSHIP: 07S
LONGITUDE: 109 44.90 RANGE: 25E
ELEV: 2880 SECTION: 1 .NW1/4 1/4 B&M: G&SR
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: ALLUVIUM & GILA RIVER DEPOSITS

SURFACE DISCHARGE TOTAL: L/MIN

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP. 42 C OR

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 12/74 SOURCE: MARINER 1975

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HCO3
42	0.0	7.59	0.00	0.00	0.00	0.00	0.0	0.0	0

OTHER CHEMICAL DATA TEMP. SI02, 106; NA-K-CA, 102

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
0.0	0.0	0.0	0.0	0.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 110

BEST EST. AVER. TEMP 110.0

AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.10 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS: GRAVITY, MAG

DEVELOPMENTS:

REFERENCES: FORRESTER, 1962; MARINER, 1975; SAUCK AND SUMNER, 1970; WEST & SUMNER, 1973

TOPO MAPS: SAFFORD 1:62,500

SPRING IDENTIFIED:NO

COMMENTS:

MAY BE CALCITE PPT AND NON QTZ. SILICA CONTROL. TEMPS MAY BE HIGH.

PREPARED BY: CALZIA & RENNER

NAME: MT. GRAHAM HOT MINERAL WELL . AZ

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Selected Geothermal Resources Assessment Data

Hydrothermal Convection Systems in California

**By: Charles Brook, Jack A. Crowley, and J. P. Calzia,
Menlo Park, California**

J. L. Renner, Denver, Colorado

and

K. E. Telleen, Menlo Park, California

Contents

Hot-Spring Data Sheets

Vapor-dominated systems

Hot water greater than 150°C

Hot water from 90° to 150°C

References

INPUT CORD # 37 MIRRORED ON 3/76
NAME: THE GEYSERS, CALIFORNIA RESOURCE CATEGORY: VAPOR-DOMINATED
WARNING FIG: 8 NUMBER: 72&73,74,62,63 DATE: 04/75
LOCATION:

STATE: CALIFORNIA COUNTY: SONOMA & LAKE
LATITUDE: 38 48.00 TOWNSHIP: 11N
LONGITUDE: 122 48.00 RANGE: 9W
ELEV: 1800 SECTION: 13, NE1/4 1/4 B&M: MDM
SURFACE MANIFESTATIONS: HOT SPRING(S), FUMAROLE OR WARM VAPOR.

ROCK AND STRUCTURE TYPE: FRANCISCAN FM. GRAYWACKE, GREENSTONE, SERPENTINE
SURFACE DISCHARGE TOTAL: 100.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 1.0 KM**2
APPROX. # OF HOT SPRINGS: 20

TEMPERATURE: RANGE OF SPRING TEMP. 20 C TO 101 C OR
MAX. WELL TEMP 240 C AT 2000 M DEPTH

BOTTOM HOLE TEMP. 240 C AT 3000 M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE:

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
0	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0

OTHER CHEMICAL DATA

SI02 ADIABATIC	SI02 CONDUCTIVE	SI02 CHALCEDONY	NA_K_CA 1/3	OTHER 4/3
0.0	0.0	0.0	0.0	0.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 170 C TO 240 C ASSUMED

BEST EST. AVER. TEMP 240.0

AREA 60.0 TO 90.0 KM**2; BEST ESTIMATE 70.0 KM**2

BASED ON DRILLING, LEASING, & GEOPHYSICS

DEPTH TO TOP OF RES. 0.10 KM TO 1.50 KM; BEST ESTIMATE 1.00 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 2.00 KM.

VOLUME 120.00 TO 180.00 KM**3; BEST ESTIMATE 140.00 KM**3

HEAT CONTENT > 15 C 16.20 TO 24.30 E18 CAL; BEST ESTIMATE 18.90 E18 CAL

POROSITY 0.01 TO 0.10 BEST ESTIMATE 0.05

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW 45000 TO 70000 KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS: GRAVITY, MAG, DC RESISTIVITY, SEISMIC NOISE, MICROEARTHQUAKES

DEVELOPMENTS: >100 WELLS (EARLY 1975)

REFERENCES: DAY & ALLEN 1927; MCNITT 1963, WHITE AND OTHERS, 1971; RAMEY, 1970

TOPO MAPS: THE GEYSERS 1:24000

SPRING IDENTIFIED: YES

COMMENTS:

RESERVOIR PROBABLY CONTINUES TO 4 KM DEPTH? ESTIMATED PRESENT CONDUCTIVE HEAT FLOW FROM TOP OF RESERVOIR 10.5E
6 CAL/SEC FROM ASSUMED 70 KM**2; THIS WOULD REQUIRE ABOUT 57000 YEARS TO SUPPLY EST. STORED HEAT. PRESENT PRODU
CTION OF HEAT IN STEAM, 500 MW, 9 KG/KWHR, 670 CAL PER GM IS 3.04E12 CAL/HR OR ABOUT 80 TIMES ESTIMATED NATURA
L HEAT FLOW.

PREPARED BY: D. E. WHITE AND D. L. WILLIAMS

NAME: THE GEYSERS, CALIFORNIA

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INPUT WORD # 38 MIRRORED ON 3/76
NAME: LASSEN, CA RESOURCE CATEGORY: VAPOR-DOMINATED
WARNING FIG: 8 NUMBER: 25-27, 34-38 DATE: 03/75
LOCATION:

STATE: CA COUNTY: SHASTA-PLUMAS-TEHAMA
LATITUDE: 40 26.00 TOWNSHIP: 30N
LONGITUDE: 121 26.00 RANGE: 05E
ELEV: 6000 SECTION: 21, SW1/4 1/4 B&M: MDM
SURFACE MANIFESTATIONS: HOT SPRING(S), FUMAROLE OR WARM VAPOR.

ROCK AND STRUCTURE TYPE: QUATERNARY VOLCANIC ROCKS, MOSTLY DACITES AND RHYODACITES NEAR LASSEN ACTIVE 1912
-19; SOME ANDESITES & BASALTS. FIELD POSSIBLY CONTROLLED BY NORTH PART OF PRE-CALDERA (?) RING FRACTURE SYSTEM.

SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 2.0 KM**2
APPROX. # OF HOT SPRINGS: ABOUT 75

TEMPERATURE: RANGE OF SPRING TEMP. 50 C TO 95 C OR

MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: DAY & ALLEN, 1925, P.111-112

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HCO3
0	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0

OTHER CHEMICAL DATA MOST SPRINGS ARE ACID-SULFATE, VERY LOW IN CL.

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
0.0	0.0	0.0	0.0	0.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 0 C TO 240 C ASSUMED

BEST EST. AVER. TEMP 240.0

AREA 10.0 TO 70.0 KM**2; BEST ESTIMATE 47.0 KM**2

BASED ON DISTRIBUTION OF VENT AREAS & ASSUMED COMPARABILITY TO THE GEYSERS SYST

DEPTH TO TOP OF RES. 0.10 KM TO 2.00 KM; BEST ESTIMATE 1.00 KM.

DEPTH TO BOTTOM OF RES. 1.50 KM TO 3.00 KM; BEST ESTIMATE 2.00 KM.

THICKNESS 0.50 TO 2.90 KM; BEST ESTIMATE 1.00 KM.

VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 47.00 KM**3

HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 6.30 E18 CAL

POROSITY 0.05 TO 0.10 BEST ESTIMATE 0.07

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS: NONE

DEVELOPMENTS:

REFERENCES: DAY & ALLEN 1925; WILLIAMS, 1932; UNPUBLISHED DATA

TOPO MAPS: (SPECIAL MAP) LASSEN VOLCANIC NATIONAL PARK & VICINITY, CALIF. 1/62.500

SPRING IDENTIFIED: YES

COMMENTS:

NO SUBSURFACE DATA ON THIS SYSTEM BUT CONSIDERED TO BE THE ONLY KNOWN POSSIBILITY IN U.S. FOR A VAPOR-DOMINATED SYSTEM THAT MIGHT BE COMPARABLE IN POTENTIAL TO THE GEYSERS; SURFACE EXPRESSIONS AND ABSENCE OF HIGH-CL WATERS ARE SIMILAR. ESTIMATED POTENTIAL ABOUT 75% OF THE GEYSERS? INDIVIDUAL AREAS ASSUMED ALL FROM A SINGLE SYSTEM

PREPARED BY: D.E. WHITE

NAME: LASSEN, CA

INPL RECORD # 39 MIRRORED ON 3/76
NAME: SURPRISE VALLEY, CA RESOURCE CATEGORY: HOT WATER > 150 C
WARNING FIG: 8 NUMBER: 14 DATE: 02/75

LOCATION:
STATE: CA COUNTY: MODOC
LATITUDE: 41 40.00 TOWNSHIP: 44N
LONGITUDE: 120 12.00 RANGE: 15E
ELEV: 4480 SECTION: 24 ,NW1/4 SE1/4 B&M: MDM
SURFACE MANIFESTATIONS: SINTER; HOT SPRING(S).

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM, TERTIARY OR POSSIBLY PLEISTOCENE VOLCANICS
SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 1.0 KM**2
APPROX. # OF HOT SPRINGS: 7

TEMPERATURE: RANGE OF SPRING TEMP. 49 C TO 97 C OR
MAX. WELL TEMP 160 C AT 1155 M DEPTH BOTTOM HOLE TEMP. C AT 1370 M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/73 SOURCE: DUFFIELD & FOURNIER 1974 (MUD VOLCANO AREA)

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
86	3.0	0.00	182.00	343.00	16.30	11.00	330.0	223.0	124

OTHER CHEMICAL DATA:

SI02 ADIABATIC	SI02 CONDUCTIVE	SI02 CHALCEDONY	NA_K_CA	OTHER
163.0	173.8	150.7	159.4	154.3

RESERVOIR PROPERTIES

RANGE IN RES TEMP 110 C TO 225 C ASSUMED
BEST EST. AVER. TEMP 175.0
AREA 40.0 TO 250.0 KM**2; BEST ESTIMATE 125.0 KM**2
BASED ON GEOLOGY, GEOPHYSICS
DEPTH TO TOP OF RES. 0.50 KM TO 1.50 KM; BEST ESTIMATE 1.00 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.50 TO 2.50 KM; BEST ESTIMATE 2.00 KM.
VOLUME 60.00 TO 625.00 KM**3; BEST ESTIMATE 250.00 KM**3
HEAT CONTENT > 15 C 3.40 TO 88.00 E18 CAL; BEST ESTIMATE 24.00 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS: GRAVITY, MAG., DC RESISTIVITY, AMT

DEVELOPMENTS: 4 WELLS DEEPEST 1370M

REFERENCES: DUFFIELD & FOURNIER, 1974; WARING, 1965; WHITE, 1955; CHAPMAN & BISHOP, 1968; GAY AND AUNE, 1958

TOPO MAPS: CEDARVILLE 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

MIXING MODELS SHOW TEMPERATURES FROM 150 TO 225C. 4 WELLS DRILLED IN AREA BY MAGMA ENERGY, 7 SPRING GROUPS, MUD VOLCANO AREA

PREPARED BY: J. RENNER, C. BROOK, D. WILLIAMS

NAME: SURPRISE VALLEY, CA

INPUT RECORD # 40 MIRRORED ON 3/76
NAME: MORGAN SPRINGS, CA RESOURCE CATEGORY: HOT WATER > 150 C
WARNING FIG: 8 NUMBER: 33 DATE: 03/75

LOCATION:

STATE: CA COUNTY: TEHAMA
LATITUDE: 40 23.00 TOWNSHIP: 29N
LONGITUDE: 121 31.00 RANGE: 04E
ELEV: 5100 SECTION: 11, 1/4 1/4 B&M: MOM
SURFACE MANIFESTATIONS: SINTER, HOT SPRING(S), GEYSER(S),

ROCK AND STRUCTURE TYPE: QUATERNARY VOLCANIC ROCKS, MOSTLY DACITES, ANDESITES

SURFACE DISCHARGE TOTAL: 350.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 3.0 KM**2

APPROX. # OF HOT SPRINGS: 25

TEMPERATURE: RANGE OF SPRING TEMP. 95 C OR WARM

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: WHITE, UNPUBLISHED DATA

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
0	95.4	30.00	233.00	1398.00	196.00	79.00	79.0	2430.0	52

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
176.8	190.7	170.6	229.4	251.2

RESERVOIR PROPERTIES

RANGE IN RES TEMP 180 C TO 220 C ASSUMED

BEST EST. AVER. TEMP 210.0

AREA 2.0 TO 50.0 KM**2; BEST ESTIMATE 5.0 KM**2

BASED ON SURFACE ACTIVITY, MAY BE MUCH LARGER

DEPTH TO TOP OF RES. 0.50 KM TO 1.50 KM; BEST ESTIMATE 1.00 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.50 TO 2.50 KM; BEST ESTIMATE 2.00 KM.

VOLUME 3.00 TO 125.00 KM**3; BEST ESTIMATE 10.00 KM**3

HEAT CONTENT > 15 C 0.30 TO 15.40 E18 CAL; BEST ESTIMATE 1.20 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1965; D. E. WHITE, UNPUBLISHED DATA

TOPO MAPS: LASSEN VOLC. NAT. PARK SPECIAL 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

SYSTEM MAY BE MUCH LARGER, ESPECIALLY IF SUBSURFACE DRAINAGE OF DEEP CL WATER FROM LARGE LASSEN V.D. SYSTEM, CONSIDERABLE SINTER

PREPARED BY: D. E. WHITE

NAME: MORGAN SPRINGS, CA

INPUT RECORD # 41 MIRRORED ON 3/76
NAME: SULFUR BANK MINE (CLEAR LAKE, HOT BOLATA) ,CA RESOURCE CATAGORY: HOT WATER > 150 C
WARNING FIG: 8 NUMBER: 57 DATE: 01/75

LOCATION:

STATE: CA COUNTY: LAKE
LATITUDE: 39 1.00 TOWNSHIP: 13N
LONGITUDE: 122 39.00 RANGE: 07W
ELEV: 1300 SECTION: 5 ,SW1/4 1/4 B&M: MDM
SURFACE MANIFESTATIONS: HOT SPRING(S), FUMAROLE OR WARM VAPOR,

ROCK AND STRUCTURE TYPE: ALTERED QUATERNARY ANDESITE AND BASALT FLOWS NEAR FAULTED LOWER CRETACEOUS STRATA

SURFACE DISCHARGE TOTAL: L/MIN

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.5 KM**2

APPROX. # OF HOT SPRINGS: 10 + 4 WELLS

TEMPERATURE: RANGE OF SPRING TEMP. 28 C TO 69 C OR

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. 186 C AT 1520 M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: BERKSTRESSER, 1968

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HCO3
99	0.0	8.10	203.00	1340.00	44.00	26.00	680.0	900.0	2600

OTHER CHEMICAL DATA MG-23, LI-6.4, F-1.4, B-828, ANALYSIS FROM WELL

SI02

SI02

SI02

NA_K_CA

OTHER

ADIABATIC

CONDUCTIVE

CHALCEDONY

1/3

4/3

169.0

181.1

159.3

156.5

201.0

RESERVOIR PROPERTIES

RANGE IN RES. TEMP 155 C TO 190 MEASURED

BEST EST. AVER. TEMP 185.0

AREA 1.0 TO 4.0 KM**2; BEST ESTIMATE 2.5 KM**2

BASED ON GEOLOGY

DEPTH TO TOP OF RES. 0.50 KM TO 1.50 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.50 TO 2.50 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.50 TO 10.00 KM**3; BEST ESTIMATE 3.75 KM**3

HEAT CONTENT > 15 C 0.13 TO 1.10 E18 CAL; BEST ESTIMATE 0.38 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS: GRAVITY, DC RESISTIVITY

DEVELOPMENTS: 4 WELLS

REFERENCES: WARING, 1965; BERKSTRESSER, 1968; KOENIG, 1970; MCNITT, 1968

TOPO MAPS: CLEARLAKE OAKS, CA 1:62,500

SPRING IDENTIFIED: NO

COMMENTS:

4 WELLS DRILLED BY MAGMA POWER CO. AND EARTH ENERGY, INC. (1961-64). HOT WATER WITH 5% STEAM FLASH OVER, REPORTED RESERVOIR TEMP - 182C (KOENIG, 1970), HOT SPRINGS TO 69C, HOT MINE WATERS TO 80C AT 94 METERS.

PREPARED BY: C. BROOK, J. RENNER

NAME: SULFUR BANK MINE (CLEAR LAKE, HOT BOLATA) , CA

INP RECORD # 42 MIRRORED ON 3/76
NAME: CALISTOGA ,CA RESOURCE CATAGORY: HOT WATER > 150 C
WARING FIG: 8 NUMBER: 81 DATE: 02/75
LOCATION:

STATE: CA COUNTY: NAPA
LATITUDE: 38 34.93 TOWNSHIP: 09N
LONGITUDE: 122 34.43 RANGE: 06W
ELEV: 350 SECTION: 31 .NW1/4 SW1/4 B&M: MDM
SURFACE MANIFESTATIONS: HOT SPRING(S),

ROCK AND STRUCTURE TYPE: FAULTED TUFF (PLIOCENE?)

SURFACE DISCHARGE TOTAL: 30.0 L/MIN

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 4 + SEVERAL FLOWING WELLS

TEMPERATURE: RANGE OF SPRING TEMP.

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. 101 C AT 46 M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: BERKSTRESSER, 1968

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HCO3
99	1965.0	9.00	139.00	193.00	8.80	4.50	12.0	215.0	1

OTHER CHEMICAL DATA LI-2.1,F-12.8-9.2,MG-0

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
148.8	156.7	130.9	155.3	144.3

RESERVOIR PROPERTIES

RANGE IN RES TEMP 130 C TO 165 C ASSUMED

BEST EST. AVER. TEMP 160.0

AREA 2.0 TO 6.0 KM**2; BEST ESTIMATE 4.5 KM**2

BASED ON GEOLOGY

DEPTH TO TOP OF RES. 0.50 KM TO 2.00 KM; BEST ESTIMATE 1.00 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.50 KM; BEST ESTIMATE 2.00 KM.

VOLUME 2.00 TO 15.00 KM**3; BEST ESTIMATE 9.00 KM**3

HEAT CONTENT > 15 C 0.14 TO 1.40 E18 CAL; BEST ESTIMATE 0.78 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS: 3 WELLS DRILLED BY CALISTOGA POWER CO., OTHER WELLS USED BATHING & HEALTH RESORTS

REFERENCES: BERKSTRESSER, 1968; WARING, 1915, 1965; KOENIG 1970; MCNITT 1963; FOX & OTHERS 1973

TOPO MAPS: CALISTOGA 1:24,000

SPRING IDENTIFIED: YES

COMMENTS:

ONE GEYSERING WELL

PREPARED BY: C. BROOK, J. RENNER

NAME: CALISTOGA , CA

INPUT CORD # 43 MIRRORED ON 3/76
NAME: SKAGGS HOT SPRINGS, CA RESOURCE CATEGORY: HOT WATER 150 C
WARING FIG: 8 NUMBER: 71 DATE: 01/75

LOCATION:

STATE: CA COUNTY: SONOMA
LATITUDE: 38 41.55 TOWNSHIP: 10N
LONGITUDE: 123 1.53 RANGE: 11W
ELEV: 320 SECTION: 25 ,NW1/4 NE1/4 B&M: MDM
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: FRACTURED SEDIMENTARY RX. (FRANCISCAN FM)

SURFACE DISCHARGE TOTAL: 57.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 3

TEMPERATURE: RANGE OF SPRING TEMP. 49 C TO 57 C OR

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: BERKSTRESSER 1968

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03
56	15.0	7.20	124.00	945.00	29.00	14.00	5.0	54.0	247.0

OTHER CHEMICAL DATA MG-4.5, F-9.8, B-9.0

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
143.1	149.9	123.1	152.6	193.9

RESERVOIR PROPERTIES

RANGE IN RES TEMP 120 C TO 160 C ASSUMED

BEST EST. AVER. TEMP 155.0

AREA 1.0 TO 2.5 KM**2; BEST ESTIMATE 2.0 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 5.00 KM**3; BEST ESTIMATE 3.00 KM**3

HEAT CONTENT > 15 C 0.06 TO 0.44 E18 CAL; BEST ESTIMATE 0.25 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1965; BERKSTRESSER, 1968; JENNINGS AND STRAND, 1960

TOPO MAPS: SKAGGS SPRINGS: 24,000

SPRING IDENTIFIED: YES

COMMENTS:

H2S ODOR; FLAMMABLE GAS DISCHARGES WITH WATER

PREPARED BY: C. BROOK, J. RENNER

NAME: SKAGGS HOT SPRINGS, CA

INPR RECORD # 44 MIRRORED ON 3/76
NAME: LONG VALLEY, CA RESOURCE CATEGORY: HOT WATER > 150 C
WARNING FIG: 8 NUMBER: 123-126 DATE: 05/75
LOCATION:

STATE: CA COUNTY: MONO
LATITUDE: 37 40.00 TOWNSHIP: 03S
LONGITUDE: 118 52.00 RANGE: 28E
ELEV: 7100 SECTION: 35 . 1/4 1/4 86M: MDM
SURFACE MANIFESTATIONS: SINTER, HOT SPRING(S), FUMAROLE OR WARM VAPOR.

ROCK AND STRUCTURE TYPE: PLEISTOCENE RHYOLITIC VOLCANICS

SURFACE DISCHARGE TOTAL: L/MIN

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 10.0 KM**2

APPROX. # OF HOT SPRINGS: 40

TEMPERATURE: RANGE OF SPRING TEMP. 60 C TO 94 C OR

MAX. WELL TEMP 181 C AT 300 M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: WILLEY ETAL 1974 (MAGMA RITCHIE #5)

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
94	0.0	9.20	340.00	390.00	45.00	0.90	130.0	280.0	450

OTHER CHEMICAL DATA 8-15, LI-2.8

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
199.7	219.1	204.9	237.9	343.8

RESERVOIR PROPERTIES

RANGE IN RES TEMP 200 C TO 250 C ASSUMED

BEST EST. AVER. TEMP 220.0

AREA 40.0 TO 230.0 KM**2; BEST ESTIMATE 225.0 KM**2

BASED ON GEOLOGY, GEOPHYSICS

DEPTH TO TOP OF RES. 0.50 KM TO 1.50 KM; BEST ESTIMATE 1.00 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.50 TO 2.50 KM; BEST ESTIMATE 2.00 KM.

VOLUME 60.00 TO 575.00 KM**3; BEST ESTIMATE 450.00 KM**3

HEAT CONTENT > 15 C 6.70 TO 81.00 E18 CAL; BEST ESTIMATE 55.00 E18 CAL

POROSITY 0.07 TO 0.23 BEST ESTIMATE 0.15

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS: GRAVITY, MAG, DC RESIST., SEISMIC NOISE, P-DELAY, MICROEARTHQUAKES, AMT, HEAT FLOW, TEMP. GRAD

DEVELOPMENTS: ABOUT 10 WELLS DRILLED

REFERENCES: BAILEY, 1974; HOOVER AND OTHERS, 1974; LEWIS, 1974; STANLEY AND OTHERS 1973 WILLEY AND OTHERS, 1974

TOPO MAPS: MT. MORRISON 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

PLEISTOCENE CALDERA STRUCTURE

PREPARED BY: J. RENNER, J. A. CROWLEY

NAME: LONG VALLEY, CA

INPUT CORD # 45 MIRRORED ON 3/76
NAME: REDS MEADOW HOT SPRINGS, CA RESOURCE CATEGORY: HOT WATER > 150 C
WARNING FIG: B NUMBER: 128 DATE: 04/75

LOCATION:

STATE: CA COUNTY: MADERA
LATITUDE: 37 37.00 TOWNSHIP: 04S
LONGITUDE: 119 4.50 RANGE: 26E
ELEV: 7600 SECTION: 11. 1/4 1/4 8&M: M.D.M.
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: QUATERNARY RHYOLITE TUFF OVERLAIN BY ANDESITE FLOWS

SURFACE DISCHARGE TOTAL: 38.0 L/MIN

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 5

TEMPERATURE: RANGE OF SPRING TEMP. 32 C TO 49 C OR

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/75 SOURCE: MARINER, 1975 UNPUBLISHED

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
46	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0

OTHER CHEMICAL DATA QZ THERMOMETER 161C, NA-K-CA 130C

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY		
0.0	0.0	0.0	1/3	4/3
			0.0	0.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 60 C TO 170 C ASSUMED

BEST EST. AVER. TEMP 165.0

AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.20 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: HUBER AND RINEHART, 1965; MARINER 1975

TOPO MAPS: DEVILS POSTPILE 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

ABOUT 3 HFU HAS BEEN CALCULATED FOR NEARBY TEMPERATURE GRADIENT HOLE. WATER MAY BE IN EQUILIBRIUM WITH OPAL OR CHALCEDONY

PREPARED BY: J. L. RENNERT, J. A. CROWLEY

NAME: REDS MEADOW HOT SPRINGS, CA

INPUT RECORD # 46 MIRRORED ON 3/76
NAME: COSO HOT SPRINGS, CA RESOURCE CATEGORY: HOT WATER > C
WARNING FIG: 8 NUMBER: 141-143 DATE: 00/00

LOCATION:

STATE: CA COUNTY: INYO
LATITUDE: 36 3.00 TOWNSHIP: 22S
LONGITUDE: 117 47.00 RANGE: 38E
ELEV: 3600 SECTION: 4, 1/4 1/4 1/4 1/4 URM: MDM

SURFACE MANIFESTATIONS: SINTER, HOT SPRING(S), FUMAROLE OR WARM VAPOR.

ROCK AND STRUCTURE TYPE: RHYOLITE VOLCANICS, GRANITE

SURFACE DISCHARGE TOTAL: L/MIN

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 1.0 KM**2

APPROX. # OF HOT SPRINGS: 10

TEMPERATURE: RANGE OF SPRING TEMP. 60 C TO 95 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MOYLE, 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
0	0.0	8.50	150.00	1630.00	244.00	74.00	53.0	3040.0	0

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
152.7	161.4	136.3	238.0	275.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 150 C TO 240 C ASSUMED

BEST EST. AVER. TEMP 220.0

AREA 114.0 TO 1264.0 KM**2; BEST ESTIMATE 168.0 KM**2

BASED ON GEOLOGY, GEOPHYSICS

DEPTH TO TOP OF RES. 0.50 KM TO 1.50 KM; BEST ESTIMATE 1.00 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.50 TO 2.50 KM; BEST ESTIMATE 2.00 KM.

VOLUME 171.00 TO 3160.00 KM**3; BEST ESTIMATE 336.00 KM**3

HEAT CONTENT > 15 C 13.90 TO 430.00 E18 CAL; BEST ESTIMATE 41.30 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS: GRAVITY, MAG, DC RESISTIVITY, MICROEARTHQUAKES

DEVELOPMENTS: 1 SHALLOW WELL FLOWING TEMPERATURE 116C

REFERENCES: MOYLE 1974; COMBS, 1974; ROSS AND YATES, 1943

TOPO MAPS: HAIWEE RESERVOIR 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

COSO AND DEVILS KITCHEN MAY BE SEPARATE SYSTEMS; HOWEVER GEOPHYSICAL DATA INDICATES THIS COULD BE A VERY LARGE SYSTEM. WEAK FUMAROLE AREAS AND ACID SULFATE SPRINGS, MAY BE A SMALL NEAR SURFACE VAPOR DOMINATED ZONE.

PREPARED BY: J. A. CROWLEY, J. RENNER, D. WILLIAMS, D. WHITE, W. DUFFIELD

NAME: COSO HOT SPRINGS, CA

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INPUT RECORD # 47 MIRRORED ON 3/76
NAME: SESPE HOT SPRINGS, CA RESOURCE CATEGORY: HOT WATER > 150 C
WARING FIG: 8 NUMBER: 111 DATE: 12/74
LOCATION:

STATE: CA COUNTY: VENTURA
LATITUDE: 34 35.70 TOWNSHIP: 06N
LONGITUDE: 118 59.90 RANGE: 20W
ELEV: 2850 SECTION: 21 .SE1/4 SE1/4 B&M: SB
SURFACE MANIFESTATIONS:

ROCK AND STRUCTURE TYPE: ALLUVIUM, GRANITICS
SURFACE DISCHARGE TOTAL: 470.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.2 KM**2
APPROX. # OF HOT SPRINGS: 6

TEMPERATURE: RANGE OF SPRING TEMP. 90 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MOYLE, 1974

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
90	360.0	8.00	92.00	320.00	16.00	23.00	288.0	292.0	68

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
128.8	133.0	104.0	154.8	130.1

RESERVOIR PROPERTIES

RANGE IN RES TEMP 90 C TO 160 C ASSUMED
BEST EST. AVER. TEMP 155.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.05 TO 0.35 E18 CAL; BEST ESTIMATE 0.19 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1915, JENNINGS AND STRAND, 1969; MOYLE, 1974;

TOPO MAPS: DEVILS HEART PEAK 1:31,680

SPRING IDENTIFIED: YES

COMMENTS:

PREPARED BY: JACK A. CROWLEY, J. RENNER

NAME: SESPE HOT SPRINGS, CA

INPUT RECORD # 48 MIRRORED ON 3/76
NAME: SALTON SEA ,CA RESOURCE CATAGORY: HOT WATER > 150 C
WARNING FIG: 8 NUMBER: 182A DATE: 12/74

LOCATION:

STATE: CA COUNTY: IMPERIAL
LATITUDE: 33 12.00 TOWNSHIP: 11S
LONGITUDE: 115 36.00 RANGE: 13E
ELEV: -230 SECTION: 22 , 1/4 1/4 B&M: SBM
SURFACE MANIFESTATIONS: HOT SPRING(S), FUMAROLE OR WARM VAPOR.

ROCK AND STRUCTURE TYPE: SHALE -SILTSTONE CAPROCK UNDERLAIN BY ARKOSIC SAND

SURFACE DISCHARGE TOTAL: L/MIN

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 2.5 KM**2

APPROX. # OF HOT SPRINGS: 5

TEMPERATURE: RANGE OF SPRING TEMP. 72 C TO 101 C OR BOILING

MAX. WELL TEMP 360 C AT 2100 M DEPTH

BOTTOM HOLE TEMP. 360 C AT 2100 M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE:

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HCO3
0	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0

OTHER CHEMICAL DATA HYPERSALINE BRINE 250,000 PPM

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
0.0	0.0	0.0	0.0	0.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 300 C TO 360 MEASURED

BEST EST. AVER. TEMP 340.0

AREA 23.0 TO 104.0 KM**2; BEST ESTIMATE 54.0 KM**2

BASED ON GEOLOGY, GEOPHYSICS, DRILLING

DEPTH TO TOP OF RES. 0.70 KM TO 1.50 KM; BEST ESTIMATE 1.00 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.50 TO 2.30 KM; BEST ESTIMATE 2.00 KM.

VOLUME 34.50 TO 240.00 KM**3; BEST ESTIMATE 108.00 KM**3

HEAT CONTENT > 15 C 5.90 TO 50.00 E18 CAL; BEST ESTIMATE 21.00 E18 CAL

POROSITY 0.15 TO 0.20 BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS: GRAVITY, MAG, TEMPERATURE GRADIENT

DEVELOPMENTS: ABOUT 20 WELLS, 700 TO 2400 M. DEPTH, TEMPERATURES TO 360C IN HYPERSALINE BRINE

REFERENCES: HELGESON, 1968; MUNGER WELL HISTORIES; MUFFLER & WHITE, 1969; WHITE, 1965

TOPO MAPS: NILAND 1:24000, OBSIDIAN BUTTE 1:24000

SPRING IDENTIFIED: YES

COMMENTS:

MIN. AREA BASED ON DRILLING. HOT SPRINGS NOW COVERED BY SALTON SEA.

PREPARED BY: J. RENNER

NAME: SALTON SEA , CA

INPUT RECORD # 49 MIRRORED ON 3/76
NAME: BRAWLEY ,CA RESOURCE CATAGORY: HOT WATER > 150 C
WARNING FIG: NUMBER: DATE: 01/75
LOCATION:

STATE: CA COUNTY: IMPERIAL
LATITUDE: 33 1.00 TOWNSHIP: 13S
LONGITUDE: 115 31.00 RANGE: 14E
ELEV: -150 SECTION: 15 .SW1/4 1/4 B&M: SBM
SURFACE MANIFESTATIONS:

ROCK AND STRUCTURE TYPE: DELTAIC SEDIMENTS, SILTSTONE & SANDSTONE

SURFACE DISCHARGE TOTAL: L/MIN

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: NONE

TEMPERATURE: RANGE OF SPRING TEMP.

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. 139 C AT 2588 M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE:

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HCO3
0	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
0.0	0.0	0.0	0.0	0.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 150 C TO 300 C ASSUMED

BEST EST. AVER. TEMP 200.0

AREA 13.0 TO 31.0 KM**2; BEST ESTIMATE 18.0 KM**2

BASED ON 8 F/100 FT. BUR. RECLAMATION TEMP GRADIENT CONTOUR

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 13.00 TO 62.00 KM**3; BEST ESTIMATE 27.00 KM**3

HEAT CONTENT > 15 C 1.00 TO 11.00 E18 CAL; BEST ESTIMATE 3.00 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS: TEMPERATURE GRADIENT

DEVELOPMENTS: 1 OIL WELL TO 2400M; FOUR GEOTHERMAL LOCATIONS BY UNION OIL.

REFERENCES: MUNGER'S DAILY OILOGRAM 12-74; BUREAU OF RECLAMATION, 1972; DUTCHER AND OTHERS, 1972; MOYLE, 1974

TOPO MAPS: WESTMORLAND 1:24,000

SPRING IDENTIFIED: NO

COMMENTS:

NO SURFACE DISCHARGE

PREPARED BY: J. P. CALZIA, J. RENNER

NAME: BRAWLEY , CA

INPU: RECORD # 50 MIRRORED ON 3/76
NAME: HEBER, CA RESOURCE CATAGORY: HOT WATER > 150 C
WARNING FIG: NUMBER: DATE: 12/74

LOCATION:

STATE: CA COUNTY: IMPERIAL
LATITUDE: 32 43.00 TOWNSHIP: 16S
LONGITUDE: 115 31.70 RANGE: 14E
ELEV: -5 SECTION: 29 .SE1/4 1/4 8&M: SBM

SURFACE MANIFESTATIONS: NO VISIBLE MANIFESTATION, FOUND BY HEAT FLOW ANOMALY.

ROCK AND STRUCTURE TYPE: SANDY DELTAIC SEDIMENTS

SURFACE DISCHARGE TOTAL: L/MIN

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP.

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. 168 C AT 1560 M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE:

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
0	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
0.0	0.0	0.0	0.0	0.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 150 C TO 225 C ASSUMED

BEST EST. AVER. TEMP 190.0

AREA 10.0 TO 85.0 KM**2; BEST ESTIMATE 50.0 KM**2

BASED ON 8 F/100 FT. CONTOUR

DEPTH TO TOP OF RES. 0.70 KM TO 1.50 KM; BEST ESTIMATE 1.00 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.50 TO 2.30 KM; BEST ESTIMATE 2.00 KM.

VOLUME 15.00 TO 195.00 KM**3; BEST ESTIMATE 100.00 KM**3

HEAT CONTENT > 15 C 1.20 TO 25.00 E18 CAL; BEST ESTIMATE 11.00 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS: GRAVITY, DC RESISTIVITY, TEMPERATURE GRADIENT

DEVELOPMENTS: 8 WELLS DRILLED. MOLTZ #1 168C AT 1560 M (PERS. COM. BILL HARUT, 1975).

REFERENCES: BUR REC, 1972; DUTCHER AND OTHERS, 1972

TOPO MAPS: HEBER 1:24,000

SPRING IDENTIFIED: NO

COMMENTS:

ESTIMATED USING PARALLEL TO EAST MESA, AVAILABLE TEMPERATURE GRADIENT DATA AND WELL LOCATIONS. MIN. AREA BASED ON DRILL SITES.

PREPARED BY: . RENNER, J. P. CALZIA

NAME: HEBER . CA

INPUT RECORD # 51 MIRRORED ON 3/76
NAME: EAST MESA ,CA RESOURCE CATEGORY: HOT WATER > 150 C
WARNING FIG: NUMBER: DATE: 12/74

LOCATION:

STATE: CA COUNTY: IMPERIAL
LATITUDE: 32 47.00 TOWNSHIP: 16S
LONGITUDE: 115 15.00 RANGE: 17E
ELEV: 25 SECTION: 6 .SE1/4 1/4 B&M: SBM

SURFACE MANIFESTATIONS: NO VISIBLE MANIFESTATION, FOUND BY HEAT FLOW ANOMALY, FOUND BY RESISTIVITY ANOMALY, FOUND BY DRILLING

ROCK AND STRUCTURE TYPE: COLORADO RIVER DELTAIC DEPOSITS

SURFACE DISCHARGE TOTAL: L/MIN

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP.

MAX. WELL TEMP 200 C AT 2450 M DEPTH

BOTTOM HOLE TEMP. 200 C AT 2450 M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE:

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HCO3
0	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
0.0	0.0	0.0	0.0	0.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 150 C TO 225 C ASSUMED

BEST EST. AVER. TEMP 180.0

AREA 5.0 TO 56.0 KM**2; BEST ESTIMATE 28.0 KM**2

BASED ON 8 F/100 FT. GRAD. BUR REC. 1972

DEPTH TO TOP OF RES. 0.70 KM TO 1.50 KM; BEST ESTIMATE 1.00 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.50 TO 2.30 KM; BEST ESTIMATE 2.00 KM.

VOLUME 7.50 TO 128.00 KM**3; BEST ESTIMATE 56.00 KM**3

HEAT CONTENT > 15 C 0.60 TO 16.10 E18 CAL; BEST ESTIMATE 5.50 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS: GRAVITY, DC RESISTIVITY, SEISMIC NOISE, MICROEARTHQUAKES, HEAT FLOW, TEMPERATURE GRADIENT

DEVELOPMENTS: 5 DEEP WELLS 1500 TO 2450M

REFERENCES: BUR REC, 1972; BUR REC, 1973; DUTCHER AND OTHERS, 1972

TOPO MAPS: HOLTVILLE EAST, 124000

SPRING IDENTIFIED; NO

COMMENTS:

TEMPERATURE ESTIMATED USING DRILLING DATA, VOLUME FROM TEMPERATURE GRADIENT DATA AND DRILL HOLE DATA

PREPARED BY: J. RENNER, J. P. CALZIA

NAME: EAST MESA , CA

INPUT RECORD # 52 MIRRORED ON 3/76
NAME: BORDER ,CA RESOURCE CATAGORY: HOT WATER > 150 C
WARNING FIG: NUMBER: DATE: 12/74

LOCATION:

STATE: CA COUNTY: IMPERIAL
LATITUDE: 32 44.00 TOWNSHIP: 16S
LONGITUDE: 115 7.60 RANGE: 18E
ELEV: 120 SECTION: 28 .NW1/4 1/4 B&M: SHM

SURFACE MANIFESTATIONS: NO VISIBLE MANIFESTATION, FOUND BY HEAT FLOW ANOMALY.

ROCK AND STRUCTURE TYPE: SANDY DELTAIC SEDS
SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP.

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE:

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
0	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
0.0	0.0	0.0	0.0	0.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 150 C TO 170 C ASSUMED

BEST EST. AVER. TEMP: 160.0

AREA 2.6 TO 5.0 KM**2; BEST ESTIMATE 3.0 KM**2

BASED ON TEMP. GRAD

DEPTH TO TOP OF RES. 1.50 KM TO 3.00 KM; BEST ESTIMATE 2.40 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 0.00 TO 1.50 KM; BEST ESTIMATE 0.60 KM.

VOLUME 0.00 TO 7.50 KM**3; BEST ESTIMATE 1.80 KM**3

HEAT CONTENT > 15 C 0.00 TO 0.70 E18 CAL; BEST ESTIMATE 0.20 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS: DC RESISTIVITY, TEMPERATURE GRADIENT DEVELOPMENTS:

REFERENCES: BUR. REC 1972, DUTCHER AND OTHERS, 1972

TOPO MAPS: MIDWAY WELL 1:24,000

SPRING IDENTIFIED:NO

COMMENTS:

ASSUMED USING PARALLEL TO EAST MESA DATA. GENERALLY 8F/100 FT AS MOST LIKELY SIZE.

PREPARED BY: J. P. CALZIA, J. RENNER

NAME: BORDER , CA

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INPUT RECORD # 53 MIRRORED ON 3/76
NAME: KELLY HOT SPRING, CA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WAKING FIG: 8 NUMBER: 8 DATE: 12/74
LOCATION:

STATE: CA COUNTY: MODOC
LATITUDE: 41 27.50 TOWNSHIP: 42N
LONGITUDE: 120 50.00 RANGE: 10E
ELEV: 4360 SECTION: 29 NE1/4 NE1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONS: HOT SPRING(S) FOUND BY DRILLING

ROCK AND STRUCTURE TYPE: PLIOCENE (?) PYROCLASTICS + BASALT FLOWS
SURFACE DISCHARGE TOTAL: 1200.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP. 96 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. 110 C AT 978 M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/57 SOURCE: UNPUBLISHED USGS DATA
SPRING FLOW
TEMP L/MIN PH SIO2 NA K CA SO4 CL HC03
96 1229.0 0.00 127.00 231.00 6.40 29.00 0.0 0.0 0

OTHER CHEMICAL DATA
SIO2 SIO2 SIO2 NA_K_CA OTHER
ADIABATIC CONDUCTIVE CHALCEDONY 1/3 4/3
144.3 151.3 124.7 121.9 85.2

RESERVOIR PROPERTIES
RANGE IN RES TEMP 100 C TO 160 MEASURED
BEST EST. AVER. TEMP 150.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 0.50 KM TO 1.50 KM; BEST ESTIMATE 1.00 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.50 TO 2.50 KM; BEST ESTIMATE 2.00 KM.
VOLUME 1.50 TO 5.00 KM**3; BEST ESTIMATE 3.00 KM**3
HEAT CONTENT > 15 C 0.08 TO 0.33 E18 CAL; BEST ESTIMATE 0.24 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

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GEOPHYSICAL SURVEYS: GRAVITY (CHAPMAN & BISHOP, 1968)
DEVELOPMENTS:
REFERENCES: WARING, 1915, DUFFIELD & FOURNIER, 1974; CHAPMAN AND BISHOP, 1968; GAY AND AUNE, 1958

TOPO MAPS: CANBY 1:62,500

SPRING IDENTIFIED: YES
COMMENTS:
DRILLED BY GEOTHERMAL RESOURCES INTERNATIONAL (1969). TEMPERATURE FROM WELL DATA

PREPARED BY: C. BROOK, J. RENNER
NAME: KELLY HOT SPRING, CA

INPUT RECORD # 54 MIRRORED ON 3/76
NAME: HUNT HOT SPRINGS, CA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 12/74

LOCATION:
STATE: CA COUNTY: SHASTA
LATITUDE: 41 2.05 TOWNSHIP: 37N
LONGITUDE: 121 55.12 RANGE: 01W
ELEV: 1640 SECTION: 26 NE1/4 SE1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONS: HOT SPRING(S),

ROCK AND STRUCTURE TYPE: METAMORPHOSED VOLCANIC & SEDIMENTARY RX
SURFACE DISCHARGE TOTAL: 7.6 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 2

TEMPERATURE: RANGE OF SPRING TEMP. 58 C TO 40 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: BERKSTRESSER, 1968

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
58	3.8	9.00	49.00	300.00	6.50	53.00	504.0	152.0	0

OTHER CHEMICAL DATA MG-0, LI-0.15, F-3.5, B-13

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
101.7	101.4	69.2	111.5	75.3

RESERVOIR PROPERTIES

RANGE IN RES TEMP 70 C TO 110 C ASSUMED

BEST EST. AVER. TEMP 105.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.03 TO 0.23 E18 CAL; BEST ESTIMATE 0.12 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: BERKSTRESSER, 1968, LYDON AND O BRIEN, 1974

TOPO MAPS: BIG BEND, 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

PREPARED BY: C. BROOK, J. RENNER

NAME: HUNT HOT SPRINGS, CA

INPUT RECORD # 55 MIRRORED ON 3/76
NAME: BIG BEND HOT SPRINGS ,CA RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARNING FIG: 8 NUMBER: 24 DATE: 12/74

LOCATION:

STATE: CA COUNTY: SHASTA
LATITUDE: 41 1.33 TOWNSHIP: 37N
LONGITUDE: 121 55.12 RANGE: 01W
ELEV: 1680 SECTION: 36 ,SW1/4 NE1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: EOCENE NONMARINE SEDIMENTARY RX (MONTGOMERY CREEK FM.) PORPHYRITIC QUARTZ DIORITE

DIKE

SURFACE DISCHARGE TOTAL: 38.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 6

TEMPERATURE: RANGE OF SPRING TEMP. 82 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: BERKSTRESSER, 1968

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03
82	37.8	8.10	73.00	565.00	20.00	88.00	276.0	850.0	40

OTHER CHEMICAL DATA MG-0.6, LI-0.66, F-1.2, H-32

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
118.4	120.8	90.5	137.2	110.4

RESERVOIR PROPERTIES

RANGE IN RES TEMP 90 C TO 145 C ASSUMED
BEST EST. AVER. TEMP 140.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.05 TO 0.31 E18 CAL; BEST ESTIMATE 0.17 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: BERKSTRESSER, 1968; LYDON AND O BRIEN, 1974

TOPO MAPS: BIG BEND, CA. 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

PREPARED BY: C. BROOK, J. RENNER

NAME: BIG BEND HOT SPRINGS , CA

INPUT RECORD # 56 MIRRORED ON 3/76
NAME: SALT SPRING, CA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 12/74

LOCATION:

STATE: CA COUNTY: SHASTA
LATITUDE: 40 40.20 TOWNSHIP: 33N
LONGITUDE: 122 38.67 RANGE: 07W
ELEV: 1325 SECTION: 34, 1/4 1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONS: TRAVERTINE,

ROCK AND STRUCTURE TYPE: METAMORPHOSED MARINE SEDIMENTARY RX (BRAGDON FM) AND METAMORPHOSED VOLCANIC RX (C
OPLEY GREENSTONE), MINOR GRANITIC RX.

SURFACE DISCHARGE TOTAL: 19.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 1

TEMPERATURE: RANGE OF SPRING TEMP. 20 C TO

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: BERKSTRESSER, 1968

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HCO3
20	18.9	9.20	55.00	3030.00	12.00	1180.00	48.0	6660.0	0

OTHER CHEMICAL DATA MG-4.4, LI-2.4, F-0.2

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
106.4	106.8	75.1	62.4	54.7

RESERVOIR PROPERTIES

RANGE IN RES TEMP 55 C TO 115 C ASSUMED

BEST EST. AVER. TEMP 110.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.02 TO 0.24 E18 CAL; BEST ESTIMATE 0.13 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: BERKSTRESSER, 1968; ALBERS, 1964; LYDON AND O BRIEN, 1974

TOPO MAPS: FRENCH GULCH CA 1:62,500

SPRING IDENTIFIED:NO

COMMENTS:

SPRING ISSUES FROM ORIFICE IN TRAVERTINE CONE ON GREENSTONE

PREPARED BY:C. BROOK, J. RENNER

NAME: SALT SPRING, CA

INPUT RECORD # 57 MIRRORED ON 3/76
NAME: WENDEL - AMEDEE ,CA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARING FIG: 8 NUMBER: 30.31 DATE: 02/75
LOCATION:

STATE: CA COUNTY: LASSEN
LATITUDE: 40 18.00 TOWNSHIP: 28N
LONGITUDE: 120 11.00 RANGE: 16E
ELEV: 4000 SECTION: 8 , 1/4 1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: ALLUVIUM, CALCAREOUS TUFA, NEARBY BASALT FLOWS
SURFACE DISCHARGE TOTAL: 3500.0 L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 1.0 KM**2

APPROX. # OF HOT SPRINGS: 10
TEMPERATURE: RANGE OF SPRING TEMP. 95 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. 107 C AT 338 M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: WHITE AND OTHER 1963

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
0	0.0	0.00	96.00	227.00	6.80	16.00	288.0	160.0	27

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
130.8	135.3	106.6	129.1	101.1

RESERVOIR PROPERTIES

RANGE IN RES TEMP 125 C TO 150 C ASSUMED
BEST EST. AVER. TEMP 140.0
AREA 2.0 TO 9.0 KM**2; BEST ESTIMATE 7.0 KM**2
BASED ON
DEPTH TO TOP OF RES. 0.50 KM TO 1.50 KM; BEST ESTIMATE 1.00 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.50 TO 2.50 KM; BEST ESTIMATE 2.00 KM.
VOLUME 3.00 TO 22.50 KM**3; BEST ESTIMATE 14.00 KM**3
HEAT CONTENT > 15 C 0.20 TO 1.80 E18 CAL; BEST ESTIMATE 1.10 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1965; KOENIG, 1970; LYDON AND OTHERS, 1960; WHITE AND OTHERS, 1963

TOPO MAPS: WENDELL 1:62,500, LITCHFIELD 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

ONE WELL DRILLED BY MAGMA POWER IN 1962 AT WENDEL; 3 WELLS DRILLED AT AMEDEE BY MAGMA POWER IN 1962. DEEPEST 340 M, 107C

PREPARED BY: C. BROOK, J. RENNER

NAME: WENDEL - AMEDEE , CA

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INPUT RECORD # 58 MIRRORED ON 3/76
NAME: TUSCAN (LICK) SPRINGS, CA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 8 NUMBER: 458 DATE: 01/75
LOCATION:

STATE: CA COUNTY: TEHAMA
LATITUDE: 40 14.50 TOWNSHIP: 28N
LONGITUDE: 122 8.40 RANGE: 02W
ELEV: 770 SECTION: 32 .NW1/4 NE1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONS: HOT SPRING(S),

ROCK AND STRUCTURE TYPE: PLEISTOCENE PYROCLASTIC ROCKS
SURFACE DISCHARGE TOTAL: 189.0 L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 20

TEMPERATURE: RANGE OF SPRING TEMP. 30 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: WHITE, 1957

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
30	0.0	8.30	99.00	8080.00	51.00	22.00	67.0	11800.0	1150

OTHER CHEMICAL DATA MG-17, LI-2.0, F-4.8, B-201

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
132.2	137.0	108.5	112.0	257.9

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 145 C ASSUMED

BEST EST. AVER. TEMP 140.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.05 TO 0.31 E18 CAL; BEST ESTIMATE 0.17 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MOARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1965; WHITE, 1957; STRAND, 1962; OLMSTED AND DAVIS, 1961

TOPO MAPS: TUSCAN SPRINGS 1:24,000

SPRING IDENTIFIED: YES

COMMENTS:

PREPARED BY: C. BROOK, J. RENNER

NAME: TUSCAN (LICK) SPRINGS, CA

INPL. RECORD # 59 MIRRORED ON 3/76
NAME: SODA SPRING, CA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 01/75

LOCATION:

STATE: CA COUNTY: LAKE
LATITUDE: 39 24.80 TOWNSHIP: 18N
LONGITUDE: 122 58.60 RANGE: 10W
ELEV: 1730 SECTION: 15, NE1/4 SW1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONS: HOT SPRING(S),

ROCK AND STRUCTURE TYPE: FRANCISCAN FM.; OPAL AND MAGNESITE ALTERATION OF SERPENTINE

SURFACE DISCHARGE TOTAL: 75.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 1

TEMPERATURE: RANGE OF SPRING TEMP. 17 C TO

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: BARNES AND OTHERS, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03
17	75.0	6.50	120.00	1310.00	60.00	153.00	33.0	530.0	5030

OTHER CHEMICAL DATA MG-450, B-265

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY		
141.5	147.9	120.9	1/3 158.0	4/3 154.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 155 C ASSUMED

BEST EST. AVER. TEMP 150.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.05 TO 0.34 E18 CAL; BEST ESTIMATE 0.18 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: BARNES AND OTHERS 1973; BERKSTRESSER, 1968; JENNINGS AND STRAND, 1960

TOPO MAPS: LAKE PILLSBURY 1:62,500

SPRING IDENTIFIED: NO

COMMENTS:

NOTE HIGH MG CONCENTRATION; EST. RES. TEMP. MAY BE ANOMALOUSLY HIGH SINCE MAY HAVE NON QUARTZ SILICA CONTROL

PREPARED BY: C. BROOK, J. RENNER

NAME: SODA SPRING, CA

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INPUT RECORD # 60 MIRRORED ON 3/76
NAME: SALT SPRING, CA RESOURCE CATEGORY: HOT WATER > 150 C
WARNING FIG: NUMBER: DATE: 12/74
LOCATION:

STATE: CA COUNTY: GLENN
LATITUDE: 39 25.83 TOWNSHIP: 18N
LONGITUDE: 122 32.27 RANGE: 06W
ELEV: 1150 SECTION: 9, SW1/4 NW1/4 B&M: M.D.M.
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: SALTY TRAVERTINE APRON. ; SERPENTINE OVERLYING GRAYWACKE. IN PART ALTERED TO RODINGITE

SURFACE DISCHARGE TOTAL: 20.0 L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 1
TEMPERATURE: RANGE OF SPRING TEMP. 25 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH
CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: BARNES & OTHERS, 1973

SPRING FLOW											
TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03		
25	20.0	6.50	140.00	8400.00	90.00	115.00	63.0	11800.0	3066		

OTHER CHEMICAL DATA MG-262, BR-45, I-50, F-1.4, B-200

SI02	SI02	SI02	NA_K_CA	OTHER
ADIBATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
149.2	157.2	131.4	122.7	221.8

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 155 C ASSUMED
BEST EST. AVER. TEMP 150.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.05 TO 0.34 E18 CAL; BEST ESTIMATE 0.18 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO DARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: BERKSTRESSER, 1968, JENNINGS AND STRAND 1960, BARNES AND OTHERS, 1973

TOPO MAPS: STONEYFORD, 1:62,500

SPRING IDENTIFIED:NO

COMMENTS:

CALCITE DEPOSITS; HIGH MG CONCENTRATION PROBABLY RESULT OF SERPENTINE ALTERATION AS EVIDENCED BY RODINGITE; HIGH SILICA CONCENTRATION MAY ALSO BE RESULT OF ALTERATION PROCESS AND MAY THEREFORE BE ANOMALOUSLY HIGH DUE TO AMORPHOUS SILICA IN SOLUTION.

PREPARED BY: C. BROOK, J. RENNER

NAME: SALT SPRING, CA

INPUT RECORD # 61 MIRRORED ON 3/76
NAME: CRABTREE HOT SPRINGS, CA RESOURCE CATEGORY: HOT WATER > 150 C
WARNING FIG: 8 NUMBER: 48 DATE: 01/75

LOCATION:

STATE: CA COUNTY: LAKE
LATITUDE: 39 17.43 TOWNSHIP: 17N
LONGITUDE: 122 49.27 RANGE: 09W
ELEV: 1275 SECTION: 36 NW1/4 NE1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: SANDSTONE (FRANCISCAN FM), NEAR ULTRAMAFIC ROCKS
SURFACE DISCHARGE TOTAL: 57.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 4

TEMPERATURE: RANGE OF SPRING TEMP. 20 C TO 41 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: BERKSTRESSER, 1968

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
41	38.0	7.80	154.00	1650.00	34.00	50.00	29.0	1120.0	3680

OTHER CHEMICAL DATA MG-188, LI-4.4, B-277

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY		
154.1	163.0	138.2	1/3 133.3	4/3 166.7

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 155 C ASSUMED
BEST EST. AVER. TEMP 150.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.05 TO 0.34 E18 CAL; BEST ESTIMATE 0.18 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1965; BERKSTRESSER, 1968; IRWIN, 1960

TOPO MAPS: LAKE PILLSBURY 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

TRAVERTINE STAINED WITH IRON OXIDE DEPOSITED ON ROCKS ABOVE SPRING; ESTIMATED RESERVOIR TEMP. MAY BE HIGH (NOT E HIGH MG CONCENTRATION, SEE BARNES AND OTHERS, 1973, FOR DISCUSSION)

PREPARED BY: C. BROOK, J. RENNER

NAME: CRABTREE HOT SPRINGS, CA

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INPUT RECORD # 62 MIRRORED ON 3/76
NAME: FOUTS SPRING (REDEYE) ,CA RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 8 NUMBER: 48A DATE: 12/74

LOCATION:

STATE: CA COUNTY: COLUSA
LATITUDE: 39 21.00 TOWNSHIP: 17N
LONGITUDE: 122 40.10 RANGE: 07W
ELEV: 1725 SECTION: 5 SW1/4 SW1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: SERPENTINE & ALTERED SANDSTONE

SURFACE DISCHARGE TOTAL: 7.6 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 4

TEMPERATURE: RANGE OF SPRING TEMP. 15 C TO 26 C OR

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: BARNES AND OTHERS, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03
17	0.4	6.50	125.00	3800.00	56.00	104.00	70.0	3990.0	4838

OTHER CHEMICAL DATA B 115; MG 254; F1.1

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
143.5	150.3	123.7	125.6	181.9

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 155 C ASSUMED

BEST EST. AVER. TEMP 150.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.05 TO 0.34 E18 CAL; BEST ESTIMATE 0.18 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: BERKSTRESSER, 1968; WARING, 1965, 1915; BARNES AND OTHERS, 1973

TOPO MAPS: STONYFORD 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

GEO THERMOMETRY MAY BE TOO HIGH SEE BARNES AND OTHERS, 1973

PREPARED BY: C. BROOK, J. RENNER

NAME: FOUTS SPRING (REDEYE) . CA

INPUT RECORD # 63 MIRRORED ON 3/76
NAME: FOOTS SPRING (CHAMPAGNE), CA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 00/00

LOCATION:

STATE: CA COUNTY: COLUSA
LATITUDE: 39 20.50 TOWNSHIP: 17N
LONGITUDE: 122 39.40 RANGE: 07W
ELEV: 1725 SECTION: 8, NW1/4 NE1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE:

SURFACE DISCHARGE TOTAL: 0.4 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 4

TEMPERATURE: RANGE OF SPRING TEMP. 17 C TO

MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: BERKSTRESSER, 1968

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
0	0.0	7.00	68.00	13.00	1.40	135.00	4.0	4.2	1130

OTHER CHEMICAL DATA B 0.2; MG 138; LI .03; F 1.0; NH4 0

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
115.4	117.2	86.5	127.8	-3.9

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 135 C ASSUMED

BEST EST. AVER. TEMP 130.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.05 TO 0.29 E18 CAL; BEST ESTIMATE 0.15 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO DARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: BERKSTRESSER, 1968

TOPO MAPS: STONEYFORD 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

GEOOTHERMOMETRY MAY BE INVALID (SEE BARNES AND OTHERS, 1973)

PREPARED BY: C. BROOK, J. RENNER

NAME: FOOTS SPRING (CHAMPAGNE), CA

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INPUT RECORD # 64 MIRRORED ON 3/76
NAME: ORRS SPRINGS (ORRS HOT SPRINGS, ORR S MINERAL SPRINGS) ,CA RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 8 NUMBER: 45 DATE: 01/75

LOCATION:

STATE: CA COUNTY: MENDOCINO
LATITUDE: 39 13.75 TOWNSHIP: 16N
LONGITUDE: 123 21.85 RANGE: 14W
ELEV: 940 SECTION: 24 ,SE1/4 NW1/4 H&M: MT. DIABLO
SURFACE MANIFESTATIONS: OTHER SPRING DEPOSITS, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: CRETACEOUS MARINE
SURFACE DISCHARGE TOTAL: 114.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 7

TEMPERATURE: RANGE OF SPRING TEMP. 17 C TO 40 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: BERKSTRESSER, 1968

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
40	114.0	8.60	61.00	140.00	1.30	4.80	1.0	50.0	170

OTHER CHEMICAL DATA F-14, B-38

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY		
110.7	111.8	80.6	1/3 86.0	4/3 67.1

RESERVOIR PROPERTIES

RANGE IN RES TEMP 65 C TO 125 C ASSUMED

BEST EST. AVER. TEMP 115.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.03 TO 0.26 E18 CAL; BEST ESTIMATE 0.13 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1965; BERKSTRESSER, 1968, JENNINGS AND STRAND, 1960

TOPO MAPS: BOONEVILLE, 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

WHITE SULFUR PRECIPITATED IN SPRING, GAS BUBBLES, H2S ODOR

PREPARED BY: C. BROOK, J. RENNER

NAME: ORRS SPRINGS (ORRS HOT SPRINGS, ORR S MINERAL SPRINGS) . CA

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INPUT RECORD # 65 MIRRORED ON 3/76
NAME: VICHY SPRINGS (DOOLINS UKIAH VICHY SPRINGS) ,CA RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 8 NUMBER: 46 DATE: 01/75

LOCATION:

STATE: CA COUNTY: MENDOCINO
LATITUDE: 39 9.93 TOWNSHIP: 15N
LONGITUDE: 123 9.37 RANGE: 12W
ELEV: 800 SECTION: 14 ,NW1/4 NW1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S),

ROCK AND STRUCTURE TYPE: SANDSTONE OF FRANCISCAN FM.
SURFACE DISCHARGE TOTAL: 113.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 7

TEMPERATURE: RANGE OF SPRING TEMP. 10 C TO 32 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: BERKSTRESSER, 1968

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HCO3
29	64.0	7.70	91.00	924.00	30.00	49.00	1.0	178.0	2510

OTHER CHEMICAL DATA LI-0.92, F-1.2, B-112, MG 35

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
128.3	132.4	103.4	145.1	151.6

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 145 C ASSUMED

BEST EST. AVER. TEMP 135.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.05 TO 0.31 E18 CAL; BEST ESTIMATE 0.16 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1965; BERKSTRESSER, 1968; JENNINGS AND STRAND, 1960

TOPO MAPS: UKIAH, 1:24,000

SPRING IDENTIFIED: YES

COMMENTS:

TRAVERTINE DEPOSITED ON ROCKS.

PREPARED BY: C. BROOK, J. RENNER

NAME: VICHY SPRINGS (DOOLINS UKIAH VICHY SPRINGS) , CA

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INPUT RECORD # 66 MIRRORED ON 3/76
NAME: COOKS SPRINGS, CA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WAKING FIG: NUMBER: DATE: 12/74
LOCATION:

STATE: CA COUNTY: COLUSA
LATITUDE: 39 15.20 TOWNSHIP: 16N
LONGITUDE: 122 31.40 RANGE: 06W
ELEV: 1525 SECTION: 9 .SE1/4 NE1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONS:

ROCK AND STRUCTURE TYPE: SERPENTINE
SURFACE DISCHARGE TOTAL: 0.4 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP. 16 C TO 17 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: BERKSTRESSER, 1968

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
0	0.0	6.80	91.00	710.00	50.00	21.00	6.0	880.0	3420

OTHER CHEMICAL DATA B27; MG 576; LI 2.0; F 0.3; NH4 14

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
128.3	132.4	103.4	187.1	204.5

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 190 C ASSUMED

BEST EST. AVER. TEMP 140.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.05 TO 0.42 E18 CAL; BEST ESTIMATE 0.17 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: BERKSTRESSER, 1968,

TOPO MAPS: STONYFORD 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

PREPARED BY:

NAME: COOKS SPRINGS, CA

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INPUT RECORD # 67 MIRRORED ON 3/76
NAME: SARATOGA SPRINGS, CA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 01/75
LOCATION:

STATE: CA COUNTY: LAKE
LATITUDE: 39 10.54 TOWNSHIP: 15N
LONGITUDE: 122 58.72 RANGE: 10W
ELEV: 1600 SECTION: 4 .NE1/4 SW1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONS: HOT SPRING(S),

ROCK AND STRUCTURE TYPE: GRAYWACKE WITH MINOR SHALE AND CONGLOMERATE (FRANCISCAN FM.)
SURFACE DISCHARGE TOTAL: 9.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 5

TEMPERATURE: RANGE OF SPRING TEMP. 16 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: BERKSTRESSER, 1968

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HCO3
16	3.0	6.70	99.00	224.00	7.90	280.00	5.0	50.0	3860

OTHER CHEMICAL DATA MG-496, F-2.2, B-37

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
132.2	137.0	108.5	116.0	45.7

RESERVOIR PROPERTIES

RANGE IN RES TEMP 50 C TO 140 C ASSUMED
BEST EST. AVER. TEMP 140.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.02 TO 0.30 E18 CAL; BEST ESTIMATE 0.17 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

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GEOPHYSICAL SURVEYS:

DEVELOPMENTS:
REFERENCES: BERKSTRESSER, 1968; MCNITT, 1968

TOPO MAPS: LAKEPORT 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:
CARBONATED SPRING, NOTE HIGH MG CONC., EST. RES. TEMP. MAY BE ANOMALOUSLY HIGH (SEE BARNES AND OTHERS, 1973)

PREPARED BY: C. BROOK, J. RENNER

NAME: SARATOGA SPRINGS, CA

INPUT RECORD # 68 MIRRORED ON 3/76
NAME: WILBUR H.S. AREA ,CA RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARNING FIG: 8 NUMBER: 68 DATE: 01/75
LOCATION:

STATE: CA COUNTY: COLUSA
LATITUDE: 39 2.20 TOWNSHIP: 14N
LONGITUDE: 122 5.20 RANGE: 05W
ELEV: 1350 SECTION: 28 , 1/4 1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONS: OTHER SPRING DEPOSITS, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: CHERT, ALTERED BASALT, SERPENTINITE
SURFACE DISCHARGE TOTAL: 80.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 12

TEMPERATURE: RANGE OF SPRING TEMP. 49 C TO 60 C OR
MAX. WELL TEMP 141 C AT 1132 M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: BARNES AND OTHERS, 1973

SPRING FLOW									
TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
53	80.0	7.00	200.00	8500.00	440.00	2.80	390.0	9700.0	7100

OTHER CHEMICAL DATA MG-3B

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
168.1	180.1	158.1	240.4	781.2

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 150 C ASSUMED
BEST EST. AVER. TEMP 145.0
AREA 3.0 TO 25.0 KM**2; BEST ESTIMATE 16.0 KM**2
BASED ON
DEPTH TO TOP OF RES. 0.50 KM TO 1.50 KM; BEST ESTIMATE 1.00 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.50 TO 2.50 KM; BEST ESTIMATE 2.00 KM.
VOLUME 4.50 TO 62.50 KM**3; BEST ESTIMATE 32.00 KM**3
HEAT CONTENT > 15 C 0.23 TO 5.10 E18 CAL; BEST ESTIMATE 2.50 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: BARNES AND OTHERS, 1973; BERKSTRESSER, 1968; WHITE, 1957; ROBERSON AND WHITEHEAD, 1961

TOPO MAPS: WILBUR SPRINGS 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

GEOOTHERMOMETRY MAY BE INVALID. NOTE OCCURRENCE OF CHERT AND SERPENTINE (SEE BARNES AND OTHERS, 1973)

PREPARED BY: C. BROOK, J. RENNER

NAME: WILBUR H.S. AREA ,CA

INPUT RECORD # 69 MIRRORED ON 3/76
NAME: DEADSHOT SPRING ,CA RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: NUMBER: DATE: 12/74

LOCATION:

STATE: CA COUNTY: COLUSA
LATITUDE: 39 5.10 TOWNSHIP: 14N
LONGITUDE: 122 27.40 RANGE: 05W
ELEV: 2380 SECTION: 6 ,SW1/4 SW1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: SERPENTINE
SURFACE DISCHARGE TOTAL: 4.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 4

TEMPERATURE: RANGE OF SPRING TEMP. 18 C TO 26 C OR

MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: BERKSTRESSER, 1968

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03
0	0.0	6.70	97.00	2190.00	199.00	167.00	18.0	3210.0	3280

OTHER CHEMICAL DATA B126; MG367; LI9.6; FO.9; NH4 101

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
131.3	135.9	107.3	203.6	228.1

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 205 C ASSUMED

BEST EST. AVER. TEMP 135.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.05 TO 0.46 E18 CAL; BEST ESTIMATE 0.16 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: BERKSTRESSER, 1968, WARING, 1915, 1965; STEARNS AND OTHERS, 1937

TOPO MAPS: WILBUR SPRINGS 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

GEO THERMOMETRY MAY NOT BE VALID (SEE BARNES AND OTHERS, 1973)

PREPARED BY: C. BROOK, J. RENNER

NAME: DEADSHOT SPRING , CA

INPUT RECORD # 70 MIRRORED ON 3/76
NAME: POINT ARENA HOT SPRINGS, CA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 8 NUMBER: 47 DATE: 01/75

LOCATION:

STATE: CA COUNTY: MENDOCINO
LATITUDE: 38 52.63 TOWNSHIP: 12N
LONGITUDE: 123 30.55 RANGE: 15W
ELEV: 300 SECTION: 27 SW1/4 NE1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: SHEARED AND BRECCIATED GRAYWACKE AND CONTORTED SANDSTONE OF FRANCISCAN FM

SURFACE DISCHARGE TOTAL: 19.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 2

TEMPERATURE: RANGE OF SPRING TEMP. 43 C TO 44 C OR

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: BERKSTRESSER, 1968

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
44	19.0	9.30	53.00	105.00	0.40	0.90	11.0	22.0	128

OTHER CHEMICAL DATA F-6.3, B-5.2, MG .1

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY		
104.9	105.1	73.2	1/3 63.5	4/3 62.4

RESERVOIR PROPERTIES

RANGE IN RES TEMP 60 C TO 110 C ASSUMED

BEST EST. AVER. TEMP 105.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.03 TO 0.23 E18 CAL; BEST ESTIMATE 0.12 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1965; BERKSTRESSER, 1968; JENNINGS, 1968; KOENIG, 1963A

TOPO MAPS: POINT AREA, 1:62,500

SPRING IDENTIFIED:NO

COMMENTS:

PREPARED BY:C. BROOK. J. RENNER

NAME: POINT ARENA HOT SPRINGS . CA

INPUT RECORD # 71 MIRRORED ON 3/76
NAME: ORNBAUM SPRINGS, CA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 01/75
LOCATION:

STATE: CA COUNTY: MENDOCINO
LATITUDE: 38 54.68 TOWNSHIP: 12N
LONGITUDE: 123 18.37 RANGE: 13W
ELEV: 1560 SECTION: 4, SW1/4 SE1/4 8&M: MT. DIABLO
SURFACE MANIFESTATIONS: HOT SPRING(S),

ROCK AND STRUCTURE TYPE: RX OF FRANCISCAN FM.
SURFACE DISCHARGE TOTAL: 0.4 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 1

TEMPERATURE: RANGE OF SPRING TEMP. 16 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: BERKSTRESSER, 1968

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
16	0.4	7.60	81.00	15.00	1.30	117.00	1.0	7.4	456

OTHER CHEMICAL DATA MG-12, F-0.4

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
123.0	126.2	96.4	121.8	-2.6

RESERVOIR PROPERTIES

RANGE IN RES TEMP 95 C TO 130 C ASSUMED
BEST EST. AVER. TEMP 125.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.05 TO 0.28 E18 CAL; BEST ESTIMATE 0.15 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: BERKSTRESSER, 1968; KOENIG, 1963A; IRWIN, 1960

TOPO MAPS: ORNBAUM VALLEY, 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

GEO THERMOMETRY IN AGREEMENT BUT WITH LOW SURFACE TEMP AND RELATIVELY HIGH HC03 & MG GEOTHERMOMETRY MAY BE TOO HIGH

PREPARED BY: C. BROOK, J. RENNER

NAME: ORNBAUM SPRINGS, CA

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INPUT RECORD # 72 MIRRORED ON 3/76
NAME: SEIGLER SPRINGS (INCLUDING GEYSER SPRING) ,CA RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 8 NUMBER: 59 DATE: 01/75

LOCATION:

STATE: CA COUNTY: LAKE
LATITUDE: 38 52.50 TOWNSHIP: 12N
LONGITUDE: 122 41.30 RANGE: 08W
ELEV: 2180 SECTION: 24 ,SE1/4 NE1/4 H&M: M.O.M.
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCKS. ROCK AND STRUCTURE TYPE: SERPENTINITE; SHALE OF KNOXVILLE FM.; SURROUNDED BY QUATERNARY EXTRUSIVE VOLCANIC

SURFACE DISCHARGE TOTAL: 132.0 L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 13

TEMPERATURE: RANGE OF SPRING TEMP. 14 C TO 52 C OR

MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: SEIGLER SPG. #2 OF BARNES AND OTHERS, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03
52	28.0	6.20	170.00	162.00	20.00	30.00	6.3	272.0	1258

OTHER CHEMICAL DATA MG -238, B-19

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
159.3	169.3	145.5	187.7	122.5

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 180 C ASSUMED

BEST EST. AVER. TEMP 150.0

AREA 1.0 TO 3.0 KM**2; BEST ESTIMATE 2.0 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 6.00 KM**3; BEST ESTIMATE 3.00 KM**3

HEAT CONTENT > 15 C 0.05 TO 0.60 E18 CAL; BEST ESTIMATE 0.24 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1965; BARNES AND OTHERS, 1973; BRICE, 1953

TOPO MAPS: WHISPERING PINES AND CLEAR LAKE HIGHLANDS 1:24,000

SPRING IDENTIFIED: YES

COMMENTS:

SOURCE ROCKS-OPALINE ALTERATION OF SERPENTINE; BERKSTRESSER (1968) REPORTS SI02 ABOUT 181PPM, SUGGESTING SURFACE TEMP. AS HIGH AS ABOUT 173C. BARNES WORK SUGGESTS GEOCHEMISTRY NOT A GOOD INDICATOR IN THIS GEOLOGIC SETTING OF HIGH MG & MCO3. POSSIBLY HOT WATER ON MARGIN OF GEYSERS V.O. SYSTEM.

PREPARED BY: C. BROOK, J. RENNER

NAME: SEIGLER SPRINGS (INCLUDING GEYSER SPRING) , CA

INPUT RECORD # 73 MIRRORED ON 3/76
NAME: BAKER SODA SPRING ,CA RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 01/75
LOCATION:

STATE: C/ COUNTY: LAKE
LATITUDE: 38 53.55 TOWNSHIP: 12N
LONGITUDE: 122 31.90 RANGE: 06W
ELEV: 1480 SECTION: 16 ,NE1/4 NW1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S),

ROCK AND STRUCTURE TYPE: SHALE OF KNOXVILLE FM.; SILICA -CARBONATE ROCK
SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: NUMEROUS

TEMPERATURE: RANGE OF SPRING TEMP.

MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: BERKSTRESSER, 1968

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
24	7.6	7.60	81.00	2630.00	189.00	69.00	9.9	3010.0	4560

OTHER CHEMICAL DATA MG-336; LI-7.0; B-179; F-0.8

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
123.0	126.2	96.4	202.0	271.1

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 200 MEASURED

BEST EST. AVER. TEMP 130.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.05 TO 0.44 E18 CAL; BEST ESTIMATE 0.15 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: BERKSTRESSER, 1968; BRICE, 1953

TOPO MAPS: LOWER LAKE, 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

SPRINGS ASSOCIATED WITH TALL TRAVERTINE TERRACE, NOTE THE HIGH MG CONCENTRATION, EST. RESERVOIR TEMP MAY BE AN
OMALOUSLY HIGH (SEE BARNES AND OTHERS, 1973)

PREPARED BY: C. BROOK, J. RENNER

NAME: BAKER SODA SPRING , CA

INPUT RECORD # 74 MIRRORED ON 3/76
NAME: ONE SHOT MINING CO., CA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 01/75

LOCATION:
STATE: CA COUNTY: NAPA
LATITUDE: 38 50.00 TOWNSHIP: 11N
LONGITUDE: 122 21.40 RANGE: 05W
ELEV: 1820 SECTION: 1 SE1/4 NE1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONS: SINTER, TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: SERPENTINITE, SHEARED SHALE AND SANDSTONE, QUATERNARY OLIVINE BASALTS AND SILICIFIED TUFFS.

SURFACE DISCHARGE TOTAL: 189.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP. 22 C TO
MAX. WELL TEMP. C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: BERKSTRESSER, 1968
SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
22	189.0	6.90	95.00	604.00	34.00	218.00	261.0	940.0	1500

OTHER CHEMICAL DATA MG-224, LI-1.8, B-59

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
130.3	134.7	106.0	152.6	108.4

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 155 C ASSUMED
BEST EST. AVER. TEMP 150.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.05 TO 0.34 E18 CAL; BEST ESTIMATE 0.18 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

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GEOPHYSICAL SURVEYS:
DEVELOPMENTS:
REFERENCES: BERKSTRESSER, 1968; AVERITT, 1945; FOX AND OTHERS, 1973

TOPO MAPS: MORGAN VALLEY, 1:62,500

SPRING IDENTIFIED:NO
COMMENTS:

LOCATED IN SHORT MINE ADIT; SILICEOUS AND CALCAREOUS SINTER DEPOSITS NEARBY. HIGH HC03 AND MG MAY INVALIDATE G EOTHERMOMETRY (SEE BARNES AND OTHERS, 1973)

PREPARED BY:C. BROOK, J. RENNER

NAME: ONE SHOT MINING CO. CA

INPUT RECORD # 75 MIRRORED ON 3/76
NAME: AETNA SPRINGS, CA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 8 NUMBER: 80 DATE: 01/75

LOCATION:

STATE: CA COUNTY: NAPA
LATITUDE: 38 39.48 TOWNSHIP: 09N
LONGITUDE: 122 28.73 RANGE: 06W
ELEV: 760 SECTION: 1 .NW1/4 SW1/4 8&M: MT. DIABLO
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: ALLUVIUM, SHEARED SHALE AND SANDSTONE OF FRANCISCAN FM. AND MUDSTONE AND SILTSTONE OF GREAT VALLEY SEQUENCE

SURFACE DISCHARGE TOTAL: 75.5 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 6

TEMPERATURE: RANGE OF SPRING TEMP. 17 C TO 33 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: BERKSTRESSER, 1968

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
22	37.8	6.70	96.00	352.00	6.00	22.00	0.0	166.0	1130

OTHER CHEMICAL DATA MG-79, LI-0.19, F-1.1, B-43

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY		
130.8	135.3	106.6	1/3 110.0	4/3 94.2

RESERVOIR PROPERTIES

RANGE IN RES TEMP 90 C TO 145 C ASSUMED

BEST EST. AVER. TEMP 135.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.05 TO 0.31 E18 CAL; BEST ESTIMATE 0.16 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1965; BERKSTRESSER, 1968; FOX AND OTHERS, 1973

TOPO MAPS: AETNA SPRINGS, CA 1:24,000

SPRING IDENTIFIED: YES

COMMENTS:

FAULT POSSIBLE NEARBY, GEOTHERMOMETRY MAY BE INVALID (SEE BARNES AND OTHERS, 1973)

PREPARED BY: C. BROOK, J. RENNER

NAME: AETNA SPRINGS, CA

INPUT RECORD # 76 MIRRORED ON 3/76
NAME: WALTER SPRINGS (WALTERS MINERAL SPRINGS) ,CA RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 01/75
LOCATION:

STATE: CA COUNTY: NAPA
LATITUDE: 38 39.23 TOWNSHIP: 09N
LONGITUDE: 122 21.43 RANGE: 05W
ELEV: 1010 SECTION: 12 NE1/4 NE1/4 S&M: MT. DIABLO
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: SERPENTINE, NEAR FAULT
SURFACE DISCHARGE TOTAL: 6.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP. 19 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE: 00/00 SOURCE: BERKSTRESSER, 1968

SPRING FLOW			OTHER CHEMICAL DATA MG-265						
TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03
0	0.0	6.10	94.00	232.00	5.60	28.00	54.0	208.0	1560

SI02		SI02		SI02		NA_K_CA		OTHER	
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3	OTHER	OTHER	OTHER	OTHER	OTHER
129.8	134.1	105.3	116.6	81.5					

RESERVOIR PROPERTIES:

RANGE IN RES TEMP 80 C TO 150 C ASSUMED
BEST EST. AVER. TEMP 135.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.04 TO 0.32 E18 CAL; BEST ESTIMATE 0.16 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: BERKSTRESSER, 1968;

TOPO MAPS: ST. HELENA, 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

SMALL DEPOSIT OF TRAVERTINE; LARGE QUANTITY OF GAS DISCHARGES WITH WATER, GEOTHERMOMETRY MAY NOT BE VALID. (SEE BARNES AND OTHERS, 1973)

PREPARED BY: C. BROOK, J. RENNER

NAME: WALTER SPRINGS (WALTERS MINERAL SPRINGS) , CA

INPUT RECORD # 77 MIRRORED ON 3/76
NAME: MARK WEST SPRINGS ,CA RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WAKING FIG: 8 NUMBER: 75 DATE: 01/75
LOCATION:

STATE: CA COUNTY: SONOMA
LATITUDE: 38 32.93 TOWNSHIP: 08N
LONGITUDE: 122 43.20 RANGE: 08W
ELEV: 430 SECTION: 11 SW1/4 SW1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: FAULTED PLIOCENE ANDESITIC TO BASALTIC LAVA FLOWS (SONOMA VOLCANICS)

SURFACE DISCHARGE TOTAL: 113.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 9

TEMPERATURE: RANGE OF SPRING TEMP. 15 C TO 31 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: BERKSTRESSER, 1968

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
31	0.7	8.50	105.00	29.00	3.90	31.00	1.0	16.0	226

OTHER CHEMICAL DATA MG-19, 8-1.0

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
135.0	140.3	112.3	161.6	47.9

RESERVOIR PROPERTIES

RANGE IN RES TEMP 50 C TO 145 C ASSUMED

BEST EST. AVER. TEMP 140.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.02 TO 0.31 E18 CAL; BEST ESTIMATE 0.17 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1965; BERKSTRESSER, 1968; FOX AND OTHERS, 1973

TOPO MAPS: MARK WEST SPRINGS 1:24,000

SPRING IDENTIFIED: YES

COMMENTS:

NEAR FAULT ZONE

PREPARED BY: C. BROOK, J. RENNER

NAME: MARK WEST SPRINGS , CA

INPUT RECORD # 78 MIRRORED ON 3/76
NAME: NAPA ROCK (PRIEST) SODA SPRINGS .CA RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 8 NUMBER: 83 DATE: 01/75

LOCATION:

STATE: CA COUNTY: NAPA
LATITUDE: 38 31.12 TOWNSHIP: 08N
LONGITUDE: 122 15.58 RANGE: 04W
ELEV: 1100 SECTION: 25 .NW1/4 NW1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ENTINITE ROCK AND STRUCTURE TYPE: ALTERED SANDSTONE AND SHALE (GREAT VALLEY SEQUENCE), NEAR FAULT CONTACT WITH SERP

SURFACE DISCHARGE TOTAL: 85.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 2

TEMPERATURE: RANGE OF SPRING TEMP. 26 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: BERKSTRESSER, 1968
SPRING FLOW
TEMP L/MIN PH SIO2 NA K CA SO4 CL HC03
26 85.0 6.40 111.00 136.00 5.60 22.00 0.0 146.0 1920

OTHER CHEMICAL DATA MG-349, LI-0.55, B-23

SIO2	SIO2	SIO2	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
137.7	143.4	115.8	133.2	81.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 80 C TO 150 C ASSUMED
BEST EST. AVER. TEMP 145.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.04 TO 0.32 E18 CAL; BEST ESTIMATE 0.18 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1965; BERKSTRESSER, 1968; FOX AND OTHERS, 1973

TOPO MAPS: CHILES VALLEY, 1:24,000

SPRING IDENTIFIED: YES

COMMENTS:

LARGE TRAVERTINE DEPOSIT; FAULT ZONE. GEOTHERMOMETRY MAY BE INVALID (SEE BARNES AND OTHERS, 1973)

PREPARED BY: C. BROOK, J. RENNER

NAME: NAPA ROCK (PRIEST) SODA SPRINGS . CA

INPUT RECORD # 79 MIRRORED ON 3/76
 NAME: LOS GUILICOS WARM SPRINGS (MORTON S WARM SPRINGS) ,CA RESOURCE CATAGORY: HOT WATER 90 TO 150 C
 WARING FIG: 8 NUMBER: 76 DATE: 01/75
 LOCATION:
 STATE: CA COUNTY: SONOMA
 LATITUDE: 38 23.67 TOWNSHIP: 06N
 LONGITUDE: 122 33.00 RANGE: 06W
 ELEV: 350 SECTION: 5 SW1/4 NW1/4 B&M: MT. DIABLO
 SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S),

ROCK AND STRUCTURE TYPE: PLIOCENE-PLEISTOCENE FLUVATILE DEPOSITS AND INTERBEDDED TUFF OF GLEN ELLEN AND MU
 ICHICA FMS., ANDESITE-BASALT LAVA FLOWS NEARBY

SURFACE DISCHARGE TOTAL: 75.5 L/MIN ESTIMATED: X
 CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
 TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 3

TEMPERATURE: RANGE OF SPRING TEMP. 25 C TO 31 C OR

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: BERKSTRESSER, 1968

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
29	75.0	7.30	86.00	104.00	13.00	19.00	1.0	61.0	290

OTHER CHEMICAL DATA MG-6.4

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
125.7	129.3	100.0	184.4	111.5

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 185 C ASSUMED

BEST EST. AVER. TEMP 135.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.05 TO 0.41 E18 CAL; BEST ESTIMATE 0.16 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1965; BERKSTRESSER, 1968; FOX AND OTHERS, 1973

TOPO MAPS: SANTA ROSA CA, 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

SODIUM BICARBONATE WATER, MAY BE DEPOSITING TRAVERTINE

PREPARED BY: C. BROOK, J. RENNER

NAME: LOS GUILICOS WARM SPRINGS (MORTON S WARM SPRINGS) , CA

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INPUT RECORD # 80 MIRRORED ON 3/76
NAME: NAPA SODA SPRINGS (JACKSONS NAPA SODA SPGS.) ,CA RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WAKING FIG: NUMBER: DATE: 01/75

LOCATION:

STATE: CA COUNTY: NAPA
LATITUDE: 38 23.38 TOWNSHIP: 06N
LONGITUDE: 122 16.65 RANGE: 04W
ELEV: 700 SECTION: 2 ,SW1/4 SW1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONS: HOT SPRING(S),

VOLCANICS) ROCK AND STRUCTURE TYPE: FAULTED ANDESITIC LAVA FLOWS AND PUMIÇITIC ASH FLOW TUFFS OF TERTIARY AGE (SONOMA

SURFACE DISCHARGE TOTAL: 0.8 L/MIN MEASURED X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 27

TEMPERATURE: RANGE OF SPRING TEMP. 16 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: BERKSTRESSER, 1968
SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HCO3
0	0.0	5.90	126.00	49.00	9.60	82.00	1.0	4.6	750

OTHER CHEMICAL DATA MG-76

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY		
143.9	150.8	124.2	1/3 181.9	4/3 59.9

RESERVOIR PROPERTIES

RANGE IN RES TEMP 60 C TO 155 C ASSUMED
BEST EST. AVER. TEMP 150.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.03 TO 0.34 E18 CAL; BEST ESTIMATE 0.18 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1915, BERKSTRESSER, 1968; FOX AND OTHERS, 1973

TOPO MAPS: YOUNTVILLE, 1:24,000

SPRING IDENTIFIED: YES

COMMENTS:

LOCATED AT FAULT INTERSECTION, RELATIVELY HIGH MG AND HCO3 MAY INDICATE GEOTHERMOMETRY NOT USEFUL (SEE BARNES AND OTHERS, 1973)

PREPARED BY: C. BROOK, J. RENNER

NAME: NAPA SODA SPRINGS (JACKSONS NAPA SODA SPGS.) , CA

INPUT RECORD # 81 MIRRORED ON 3/76
NAME: BROCKWAY (CARNELIAN) HOT SPRINGS ,CA RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 8 NUMBER: 44 DATE: 04/75
LOCATION:

STATE: CA COUNTY: PLACER
LATITUDE: 39 13.50 TOWNSHIP: 16N
LONGITUDE: 120 4.00 RANGE: 18E
ELEV: 6340 SECTION: 30 . 1/4 1/4 B&M: M.O.M.

SURFACE MANIFESTATIONS:

ROCK AND STRUCTURE TYPE: ANDESITE, OVERLYING GRANODIORITE
SURFACE DISCHARGE TOTAL: 570.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 6

TEMPERATURE: RANGE OF SPRING TEMP. 49 C TO 60 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/75 SOURCE: MARINER, 1975 UNPUBLISHED

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
55	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0

OTHER CHEMICAL DATA TEMP: SI02, 119C; NA-K-CA, 94

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
0.0	0.0	0.0	0.0	0.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 90 C TO 125 C ASSUMED
BEST EST. AVER. TEMP 120.0
AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.10 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:
DEVELOPMENTS:
REFERENCES: WARING, 1965

TOPO MAPS: KINGS BEACH 1:24,000

SPRING IDENTIFIED:NO
COMMENTS:
ON SHORE OF LAKE TAHOE

PREPARED BY: J. L. RENNER, J. A. CROWLEY

NAME: BROCKWAY (CARNELIAN) HOT SPRINGS , CA

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INVEST RECORD # 82 MIRRORED ON 3/76
NAME: GROVERS HOT SPRINGS, CA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 8 NUMBER: 113 DATE: 12/74

LOCATION:

STATE: CA COUNTY: ALPINE
LATITUDE: 38 41.90 TOWNSHIP: 10N
LONGITUDE: 119 51.60 RANGE: 19E
ELEV: 5900 SECTION: 24 NW1/4 SW1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: PLEISTOCENE ANDESITES & FAULTED GRANITE
SURFACE DISCHARGE TOTAL: 378.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 12

TEMPERATURE: RANGE OF SPRING TEMP. 53 C TO 63 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: FETH AND OTHERS, 1964
SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
0	0.0	7.00	96.00	428.00	11.00	34.00	160.0	183.0	760

OTHER CHEMICAL DATA LI-0.81, F-4.2, B-2.4

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
130.8	135.3	106.6	126.2	108.3

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 150 C ASSUMED

BEST EST. AVER. TEMP 140.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.05 TO 0.33 E18 CAL; BEST ESTIMATE 0.17 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: FETH AND OTHERS, 1964; CURTIS, 1951

TOPO MAPS: HARKLEEVILLE, CA 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

PROBABLY SMALL AREA IN FRACTURE ZONE

PREPARED BY: C. BROOK, J. RENNER

NAME: GROVERS HOT SPRINGS, CA

103

INPUT RECORD # 83 MIRRORED ON 3/76
NAME: FALES HOT SPRINGS, CA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 8 NUMBER: 117 DATE: 00/00

LOCATION:

STATE: CA COUNTY: MONO
LATITUDE: 38 20.00 TOWNSHIP: 06N
LONGITUDE: 119 24.00 RANGE: 23E
ELEV: 0 SECTION: 24, SE1/4 1/4 B&M: H.O.M.
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: GRANITICS, QUARTZ LATITE, VOLCANICS

SURFACE DISCHARGE TOTAL: 95.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.1 KM**2

APPROX. # OF HOT SPRINGS: 20

TEMPERATURE: RANGE OF SPRING TEMP. 50 C TO 62 C OR BOILING

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: WHITE UNPUBLISHED

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
59	0.0	6.80	118.00	550.00	31.00	42.00	263.0	160.0	1090

OTHER CHEMICAL DATA LI 1.7, MG 9.7, B 7.6

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY		
140.6	147.0	119.8	1/3 164.6	4/3 149.9

RESERVOIR PROPERTIES

RANGE IN RES TEMP 120 C TO 165 C ASSUMED

BEST EST. AVER. TEMP 150.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.06 TO 0.36 E18 CAL; BEST ESTIMATE 0.18 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1915; KOENIG, 1963B; LEWIS, 1974

TOPO MAPS: FALES H.S. 1:24,000

SPRING IDENTIFIED: YES

COMMENTS:

MAY BE DEPOSITING TRAVERTINE

PREPARED BY: JACK A. CROWLEY, J. RENNER

NAME: FALES HOT SPRINGS, CA

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INPUT RECORD # 84 MIRRORED ON 3/76
NAME: BUCKEYE HOT SPRING, CA RESOURCE: CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 8 NUMBER: 115 DATE: 04/75

LOCATION:
STATE: CA COUNTY: MONO
LATITUDE: 38 14.30 TOWNSHIP: 04N
LONGITUDE: 119 19.60 RANGE: 24E
ELEV: 6885 SECTION: 4 .NE1/4 1/4 B&M: M.D.M.
SURFACE MANIFESTATIONS: TRAVERTINE, OTHER SPRING DEPOSITS, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: GRANITICS - FAULT OR FRACTURE
SURFACE DISCHARGE TOTAL: 75.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP. 60 C TO 64 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/75 SOURCE: MARINER 1975 UNPUBLISHED

SPRING FLOW
TEMP L/MIN PH SIO2 NA K CA SO4 CL HCO3
60 0.0 0.00 0.00 0.00 0.00 0.00 0.0 0.0

OTHER CHEMICAL DATA TEMP: SIO2, 122; NA-K-CA, 138

SIO2 SIO2 SIO2 NA_K_CA OTHER
ADIABATIC CONDUCTIVE CHALCEDONY 1/3 4/3
0.0 0.0 0.0 0.0 0.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 110 C TO 150 C ASSUMED
BEST EST. AVER. TEMP 140.0
AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON 1.5
DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.20 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

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GEOPHYSICAL SURVEYS:
DEVELOPMENTS:
REFERENCES: WARING, 1965, KOENIG, 1963B

TOPO MAPS: MATTERHORN PK 1:62,500

SPRING IDENTIFIED: YES
COMMENTS:

PREPARED BY: J. L. RENNER, J. A. CROWLEY

NAME: BUCKEYE HOT SPRING, CA

INPUT RECORD # 85 MIRRORED ON 3/76
NAME: BENTON HOT SPRINGS ,CA RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARNING FIG: 8 NUMBER: 127 DATE: 04/75

LOCATION:

STATE: CA COUNTY: MONO
LATITUDE: 37 48.00 TOWNSHIP: 02S
LONGITUDE: 118 31.80 RANGE: 31E
ELEV: 5680 SECTION: 2 ,SW1/4 1/4 B&M: M.D.M.
SURFACE MANIFESTATIONS: HOT SPRING(S),

ROCK AND STRUCTURE TYPE: QUATERNARY VOLCANICS
SURFACE DISCHARGE TOTAL: 1500.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE Ex: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 2
TEMPERATURE: RANGE OF SPRING TEMP. 57 C OR

MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH
CHEMICAL DATA ANALYSIS DATE 00/75 SOURCE: MARINER, 1975 UNPUBLISHED

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
57	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0

OTHER CHEMICAL DATA TEMP: SI02, 113C, NA-K-CA, 79C

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
0.0	0.0	0.0	0.0	0.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 70 C TO 120 C ASSUMED

BEST EST. AVER. TEMP 115.0

AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.10 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS: 85

REFERENCES: WARING, 1965

TOPO MAPS: GLASS MTN. 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

PREPARED BY: J. L. RENNER, J. A. CROWLEY

NAME: BENTON HOT SPRINGS , CA

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INPUT RECORD # 86 MIRRORED ON 3/76
NAME: TRAVERTINE (MARBLE QUARRY) HOT SPRINGS ,CA RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 8 NUMBER: 116 DATE: 04/75

LOCATION:

STATE: CA COUNTY: MONO
LATITUDE: 38 14.80 TOWNSHIP: 05N
LONGITUDE: 119 12.10 RANGE: 25E
ELEV: 6750 SECTION: 34 .SE1/4 SW1/4 H&M: M.O.M.
SURFACE MANIFESTATIONS: TRAVERTINE, OTHER SPRING DEPOSITS, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: ANDESITE
SURFACE DISCHARGE TOTAL: 38.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.1 KM**2
APPROX. # OF HOT SPRINGS: 7. (3 MAIN)

TEMPERATURE: RANGE OF SPRING TEMP. 56 C TO 70 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: WARING, 1915

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
0	0.0	0.00	89.00	1109.00	35.00	60.00	939.0	214.0	0

OTHER CHEMICAL DATA MARINER UNPUBLISHED TEMPS SI02. 114C; NA-K-CA, 172C. SPRING 69C.

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
127.3	131.2	102.0	145.1	155.5

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 175 C ASSUMED
BEST EST. AVER. TEMP 120.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.14 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, G.A., 1915; WARING, 1965; KOENIG, 1963B

TOPO MAPS: BODIE 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

NA-K-CA UNCERTAIN TRAVERTINE DEPOSITION

PREPARED BY: JACK A. CROWLEY, J. RENNER

NAME: TRAVERTINE (MARBLE QUARRY) HOT SPRINGS , CA

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INPUT RECORD # 87 MIRRORED ON 3/76
NAME: BLACK POINT H.S. ,CA RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: NUMBER: DATE: 04/75

LOCATION:
STATE: CA COUNTY: MONO
LATITUDE: 38 2.40 TOWNSHIP: 02N
LONGITUDE: 119 5.00 RANGE: 26E
ELEV: 6440 SECTION: 11 , 1/4 1/4 H&M: M.O.M.
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S),

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM, QUATERNARY PYROCLASTICS NEARBY
SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP.
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH
CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER, 1975, UNPUBLISHED

SPRING FLOW
TEMP L/MIN PH SIO2 NA K CA SO4 CL HCO3
63 0.0 0.00 0.00 0.00 0.00 0.00 0.0 0.0

OTHER CHEMICAL DATA TEMP: SIO2, 122C; NA-K-CA, 124C
SIO2 SIO2 SIO2 NA_K_CA OTHER
ADIABATIC CONDUCTIVE CHALCEDONY 1/3 4/3
0.0 0.0 0.0 0.0 0.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 0 C TO 0 C ASSUMED
BEST EST. AVER. TEMP 125.0
AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.15 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:
DEVELOPMENTS:
REFERENCES: KOENIG, 1963B

TOPO MAPS: BODIE 1:62,500

SPRING IDENTIFIED: YES
COMMENTS:
TRAVERTINE

PREPARED BY: J. A. CROWLEY, J. RENNER

NAME: BLACK POINT H.S. , CA

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INPUT RECORD # 88 MIRRORED ON 3/76
NAME: PAOHA ISLAND ,CA RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 8 NUMBER: 120 DATE: 02/75

LOCATION:

STATE: CA COUNTY: MONO
LATITUDE: 37 59.80 TOWNSHIP: 02N
LONGITUDE: 119 1.20 RANGE: 27E
ELEV: 6409 SECTION: 1/4 1/4 B&M: M.D.M.
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S), FUMAROLE OR WARM VAPOR,

ROCK AND STRUCTURE TYPE: VOLCANICS
SURFACE DISCHARGE TOTAL: 370.0 L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.5 KM**2

APPROX. # OF HOT SPRINGS:
TEMPERATURE: RANGE OF SPRING TEMP. 80 C TO 83 C OR BOILING
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH
CHEMICAL DATA ANALYSIS DATE 00/75 SOURCE: MARINER, 1975, UNPUBLISHED

SPRING FLOW
TEMP L/MIN PH SI02 NA K CA SO4 CL HCO3
0 0.0 0.00 0.00 0.00 0.00 0.00 0.0 0.0 0

OTHER CHEMICAL DATA NO GEOCHEMISTRY, TEMP: SI02, 186C (QTZ); CHALCEDONY, 84C
SI02 SI02 SI02 NA_K_CA OTHER
ADIABATIC CONDUCTIVE CHALCEDONY 1/3 4/3
0.0 0.0 0.0 0.0 0.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 150 C ASSUMED
BEST EST. AVER. TEMP 125.0
AREA 1.0 TO 10.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 0.50 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.50 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 25.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.05 TO 2.00 E18 CAL; BEST ESTIMATE 0.15 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:
DEVELOPMENTS:
REFERENCES: WARING, 1965

TOPO MAPS: MONO CRATERS & BODIE 1:62,500

SPRING IDENTIFIED: NO
COMMENTS:
MAY HAVE NON-QUARTZ SILICA CONTROL. QTZ TEMP MAY BE TOO HIGH

PREPARED BY: JACK A. CROWLEY, J. RENNER

NAME: PAOHA ISLAND , CA

INPUT RECORD # 89 MIRRORED ON 3/76
NAME: MONO HOT SPRING ,CA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 8 NUMBER: 130 DATE: 04/75

LOCATION:

STATE: CA COUNTY: FRESNO
LATITUDE: 37 19.50 TOWNSHIP: 07S
LONGITUDE: 119 1.00 RANGE: 27E
ELEV: 6560 SECTION: 10 , 1/4 1/4 B&M: M.D.M.
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: GRANITICS, VOLCANICS ABOUT 1 MILE TO NORTH
SURFACE DISCHARGE TOTAL: 95.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 4

TEMPERATURE: RANGE OF SPRING TEMP. 38 C TO 44 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/75 SOURCE: MARINER, 1975, UNPUBLISHED

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
43	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0

OTHER CHEMICAL DATA TEMP: SI02, 110C; NA-K-CA, 80

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
0.0	0.0	0.0	0.0	0.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 80 C TO 120 C ASSUMED
BEST EST. AVER. TEMP 115.0
AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.13 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARNING, 1965

TOPO MAPS: KAISER PEAK 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

PREPARED BY: J. L. RENNER, J. A. CROWLEY

NAME: MONO HOT SPRING , CA

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INPUT RECORD # 90 MIRRORED ON 3/76
NAME: BLAYNEY MEADOWS H.S., CA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 8 NUMBER: 131 DATE: 04/75

LOCATION:

STATE: CA COUNTY: FRESNO
LATITUDE: 37 14.10 TOWNSHIP: 08S
LONGITUDE: 118 53.00 RANGE: 28E
ELEV: 7760 SECTION: 23 NW1/4 NW1/4 B&M: M.D.M.
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: CRETACEOUS GRANODIORITE NEAR CONTACT WITH TRIASSIC - JURASSIC METAVOLCANICS AND CRETACEOUS JURASSIC GRANODIORITE.

SURFACE DISCHARGE TOTAL: 151.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 8

TEMPERATURE: RANGE OF SPRING TEMP. 38 C TO 43 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/75 SOURCE: MARINER, 1975 UNPUBLISHED
SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HCO3
43	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0

OTHER CHEMICAL DATA TEMP: SI02, 102; NA-K-CA, 57C

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
0.0	0.0	0.0	0.0	0.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 50 C TO 110
BEST EST. AVER. TEMP 105.0
AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.12 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: BATEMAN, 1965, WARING, 1965;

TOPO MAPS: BLACK CAP MTN 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

PREPARED BY: J. A. CROWLEY, J. L. RENNER

NAME: BLAYNEY MEADOWS H.S., CA

INPUT RECORD # 91 MIRRORED ON 3/76
NAME: MERCEY HOT SPRINGS ,CA RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARNING FIG: 8 NUMBER: 132 DATE: 01/75

LOCATION:

STATE: CA COUNTY: FRESNO
LATITUDE: 36 42.20 TOWNSHIP: 14S
LONGITUDE: 120 51.60 RANGE: 10E
ELEV: 1180 SECTION: 15 ,SE1/4 SE1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: FRACTURED GREENSTONE NEAR FRANCISCAN FM.

SURFACE DISCHARGE TOTAL: 23.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 3

TEMPERATURE: RANGE OF SPRING TEMP. 26 C TO 46 C OR

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: WHITE, 1957

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03
46	0.0	8.60	75.00	830.00	7.10	43.00	5.0	1300.0	13

OTHER CHEMICAL DATA MG - NIL, 8-10

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
119.6	122.2	92.0	41.0	94.5

RESERVOIR PROPERTIES

RANGE IN RES TEMP 90 C TO 130 C ASSUMED

BEST EST. AVER. TEMP 125.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.05 TO 0.28 E18 CAL; BEST ESTIMATE 0.15 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1965; WHITE, 1957; JENNINGS AND STRAND, 1959

TOPO MAPS: MERCEY HOT SPRINGS 1:24,000

SPRING IDENTIFIED: YES

COMMENTS:

PREPARED BY: C. BROOK, J. RENNER

NAME: MERCEY HOT SPRINGS , CA

INPUT RECORD # 92 MIRRORED ON 3/76
NAME: RANDSBURG STEAM WELL .CA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 01/75

LOCATION:

STATE: CA COUNTY: SAN BERNARDINO
LATITUDE: 35 23.00 TOWNSHIP: 29S
LONGITUDE: 117 32.20 RANGE: 41E
ELEV: 3245 SECTION: 25 .SE1/4 NW1/4 d&M: M.D.M.

SURFACE MANIFESTATIONS:

ROCK AND STRUCTURE TYPE: ANDESITE, VOLCANICS UNDERLAIN BY QUARTZ MONZONITE, MESOZOIC IN AGE, ALSO SOME SCHISTS INTRUDED BY MONZ.

SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP.

MAX. WELL TEMP 115 C AT 235 M DEPTH

BOTTOM HOLE TEMP. 115 C AT 235 M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE:

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
0	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
:DIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
0.0	0.0	0.0	0.0	0.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 115 C TO 130 C ASSUMED

BEST EST. AVER. TEMP 125.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.50 KM TO 1.50 KM; BEST ESTIMATE 0.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.50 TO 2.50 KM; BEST ESTIMATE 2.50 KM.

VOLUME 1.50 TO 5.00 KM**3; BEST ESTIMATE 3.75 KM**3

HEAT CONTENT > 15 C 0.09 TO 0.35 E18 CAL; BEST ESTIMATE 0.25 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: KOENIG, 1970; MOYLE, W.R., 1974

TOPO MAPS: KLINKER MTN. 1:24,000

SPRING IDENTIFIED: YES

COMMENTS:

PREPARED BY: JACK A. CROWLEY, J. RENNER

NAME: RANDSBURG STEAM WELL , CA

INPUT RECORD # 93 MIRRORED ON 3/76
NAME: ARROWHEAD HOT SPRINGS AREA (NEAR) ,CA RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 8 NUMBER: 162 DATE: 01/75

LOCATION:
STATE: CA COUNTY: SAN BERNARDINO
LATITUDE: 34 8.60 TOWNSHIP: 01N
LONGITUDE: 117 15.20 RANGE: 04W
ELEV: 1920 SECTION: 11 ,SE1/4 NE1/4 H&M: SB
SURFACE MANIFESTATIONS:

ROCK AND STRUCTURE TYPE: FRACTURED GRANITE & GNEISS
SURFACE DISCHARGE TOTAL: 190.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.1 KM**2
APPROX. # OF HOT SPRINGS: 2

TEMPERATURE: RANGE OF SPRING TEMP. 75 C TO 94 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 08/60 SOURCE: MOYLE, 1974

TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03
0	0.0	8.30	90.00	255.00	12.00	27.00	428.0	65.0	73

OTHER CHEMICAL DATA 82.6; MGO: F8.8

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
127.8	131.8	102.7	147.1	110.9

RESERVOIR PROPERTIES

RANGE IN RES TEMP 125 C TO 155 C ASSUMED
BEST EST. AVER. TEMP 150.0
AREA 1.0 TO 2.5 KM**2; BEST ESTIMATE 2.0 KM**2
BASED ON GEOLOGY, SURFACE EXPRESSION
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 5.00 KM**3; BEST ESTIMATE 3.00 KM**3
HEAT CONTENT > 15 C 0.07 TO 0.42 E18 CAL; BEST ESTIMATE 0.24 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MOYLE, 1974; WARING, 1965

TOPO MAPS: SAN BERNARDINO N 1:24,000, SAN BERNARDINO 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

SPRINGS IN 1N 4W SEC 5 & SEC 11, ARROWHEAD IN SEC. 5. ANALYSIS FROM UNNAMED IN SEC. 11

PREPARED BY: JACK A. CROWLEY, J. RENNER

NAME: ARROWHEAD HOT SPRINGS AREA (NEAR) , CA

INPUT RECORD # 94 MIRRORED ON 3/76
NAME: PILGER ESTATES H.S., CA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 8 NUMBER: 176A DATE: 12/74

LOCATION:
STATE: CA COUNTY: RIVERSIDE
LATITUDE: 33 26.00 TOWNSHIP: 08S
LONGITUDE: 115 41.10 RANGE: 12E
ELEV: 200 SECTION: 36, 1/4 1/4 B&M: SB
SURFACE MANIFESTATIONS:

ROCK AND STRUCTURE TYPE:
SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP. 79 C TO 82 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 04/65 SOURCE: MOYLE, 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
82	0.0	7.70	79.00	888.00	33.00	107.00	225.0	1360.0	268

OTHER CHEMICAL DATA B4.4; MG16; F5

SI02	SI02	SI02	NA_K_CA	OTHER
AJIABATIC	CONDUCTIVE	CHALCEDONY		
121.9	124.9	95.0	1/3 144.8	4/3 131.8

RESERVOIR PROPERTIES

RANGE IN RES TEMP 90 C TO 150 C ASSUMED
BEST EST. AVER. TEMP 145.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.05 TO 0.32 E18 CAL; BEST ESTIMATE 0.18 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS: SPA

REFERENCES: JENNINGS, 1967; CROWELL & SUSUKI, 1959; MOYLE, 1974; WARING, 1965

TOPO MAPS: FRINK NW 1:24,000

SPRING IDENTIFIED: NO

COMMENTS:

NEAR SALTON SEA MAY BE MORE EXTENSIVE BUT PROBABLY RELATED TO FAULTS ALONG CHOCOLATE MTNS. ANOTHER SPRING IN NE 1/4 NE 1/4, SEC 2, T.9S., R.12E., SRM

PREPARED BY: JACK A. CROWLEY, J. RENNER

NAME: PILGER ESTATES H.S. • CA

INPUT RECORD # 95 MIRRORED ON 3/76
NAME: WARNER H.S. ,CA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 8 NUMBER: 179 DATE: 01/75

LOCATION:

STATE: CA COUNTY: SAN DIEGO
LATITUDE: 33 17.00 TOWNSHIP: 10S
LONGITUDE: 116 38.40 RANGE: 03E
ELEV: 9164 SECTION: 25 .NW1/4 NW1/4 B&M: SB

SURFACE MANIFESTATIONS:

ROCK AND STRUCTURE TYPE: FAULTED GRANITE
SURFACE DISCHARGE TOTAL: 570.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 6

TEMPERATURE: RANGE OF SPRING TEMP. 59 C TO 64 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 09/64 SOURCE: MOYLE, 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
0	0.0	9.80	107.00	97.00	1.00	0.40	0.4	19.0	55

OTHER CHEMICAL DATA B.9; MG.2; F4.7

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
135.9	141.4	113.5	100.0	110.9

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 150 C ASSUMED

BEST EST. AVER. TEMP 145.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.05 TO 0.34 E18 CAL; BEST ESTIMATE 0.18 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: VERBAL COMM., OWNER MOYLE 1974, WRI 33-73

TOPO MAPS: WARNER SPRINGS 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

NEAR WHITTIER FAULT ZONE

PREPARED BY: JACK A. CROWLEY, J. RENNER

NAME: WARNER H.S. , CA

INPU. RECORD # 96 MIRRORED ON 3/76
NAME: GLAMIS OR EAST BRAWLEY .CA RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 01/75
LOCATION:

STATE: CA COUNTY: IMPERIAL
LATITUDE: 32 58.00 TOWNSHIP: 14S
LONGITUDE: 115 11.00 RANGE: 17E
ELEV: 120 SECTION: 2 .NE1/4 1/4 B&M: SBM
SURFACE MANIFESTATIONS: NO VISIBLE MANIFESTATION, FOUND BY HEAT FLOW ANOMALY.

ROCK AND STRUCTURE TYPE: SANDY DELTAIC DEPOSITS
SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP.
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE:
SPRING FLOW
TEMP L/MIN PH SIO2 NA K CA SO4 CL HCO3
0 0.0 0.00 0.00 0.00 0.00 0.0 0.0 0.0 0

OTHER CHEMICAL DATA
SIO2 SIO2 SIO2 NA_K_CA OTHER
ADIABATIC CONDUCTIVE CHALCEDONY 1/3 4/3
0.0 0.0 0.0 0.0 0.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 150 C ASSUMED
BEST EST. AVER. TEMP 135.0
AREA 0.6 TO 5.0 KM**2; BEST ESTIMATE 2.0 KM**2
BASED ON TEMP. GRADIENT ANOMALY
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 0.60 TO 10.00 KM**3; BEST ESTIMATE 3.00 KM**3
HEAT CONTENT > 15 C 0.03 TO 0.80 E18 CAL; BEST ESTIMATE 0.20 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:
DEVELOPMENTS:
REFERENCES: BUR REC 1972

TOPO MAPS: GLAMIS NW 1:2400

SPRING IDENTIFIED: NO
COMMENTS:
MAY BE A SMALL AREA OF >150C

PREPARED BY: J. RENNER, J. P. CALZIA
NAME: GLAMIS OR EAST BRAWLEY . CA

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INPL RECORD # 97 MIRRORED ON 3/76
NAME: GLAMIS (EAST), CA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 01/75

LOCATION:

STATE: CA COUNTY: IMPERIAL
LATITUDE: 33 59.00 TOWNSHIP: 13S
LONGITUDE: 115 4.00 RANGE: 18E
ELEV: 350 SECTION: 33, NE1/4 1/4 B&M: S8M

SURFACE MANIFESTATIONS: NO VISIBLE MANIFESTATION, FOUND BY HEAT FLOW ANOMALY.

ROCK AND STRUCTURE TYPE: SANDY DELTAIC SEDIMENTS, ALLUVIUM

SURFACE DISCHARGE TOTAL: L/MIN

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP.

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE:

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HCO3
0	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY		
0.0	0.0	0.0	1/3 0.0	4/3 0.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 150 C ASSUMED

BEST EST. AVER. TEMP 135.0

AREA 3.5 TO 5.0 KM**2; BEST ESTIMATE 4.0 KM**2

BASED ON TEMPERATURE GRADIENTS

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 3.50 TO 10.00 KM**3; BEST ESTIMATE 6.00 KM**3

HEAT CONTENT > 15 C 0.20 TO 0.80 E18 CAL; BEST ESTIMATE 0.40 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: BUR. REC. 1972

TOPO MAPS: GLAMIS 1:24,000

SPRING IDENTIFIED: NO

COMMENTS:

MAY BE A SMALL VOLUME OF > 150C

PREPARED BY: J. RENNER, J. P. CALZIA

NAME: GLAMIS (EAST), CA

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INPUT RECORD # 98 MIRRORED ON 3/76
NAME: DUNES, CA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 01/75

LOCATION:

STATE: CA COUNTY: IMPERIAL
LATITUDE: 32 49.00 TOWNSHIP: 15S
LONGITUDE: 115 1.00 RANGE: 19E
ELEV: 250 SECTION: 28 SW1/4 1/4 B&M: SBM
SURFACE MANIFESTATIONS: NO VISIBLE MANIFESTATION FOUND BY HEAT FLOW ANOMALY.

ROCK AND STRUCTURE TYPE: SANDY DELTAIC SEDIMENTS
SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE:

RANGE OF SPRING TEMP.

MAX. WELL TEMP 103 C AT 265 M DEPTH

BOTTOM HOLE TEMP. 93 C AT 615 M DEPTH

CHEMICAL DATA

ANALYSIS DATE 60/00 SOURCE:

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HCO3
0	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
0.0	0.0	0.0	0.0	0.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 150 C ASSUMED

BEST EST. AVER. TEMP 135.0

AREA 5.0 TO 10.0 KM**2; BEST ESTIMATE 6.0 KM**2

BASED ON TEMPERATURE GRADIENTS

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 5.00 TO 20.00 KM**3; BEST ESTIMATE 9.00 KM**3

HEAT CONTENT > 15 C 0.30 TO 1.60 E18 CAL; BEST ESTIMATE 0.60 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS: TEMPERATURE GRADIENT

DEVELOPMENTS: 1 WELL TO .6 KM

REFERENCES: BUR REC. 1972, DUTCHER AND OTHERS, 1972, MUNGER WELL HISTORY

TOPO MAPS: 1:24000 GLAMIS SE

SPRING IDENTIFIED: NO

COMMENTS:

MAY BE A SMALL AREA OF GREATER THAN 150C

PREPARED BY: J. RENNER, J. P. CALZIA

NAME: DUNES, CA

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Selected Geothermal Resources Assessment Data

Hydrothermal Convection Systems in Colorado

**By: G. L. Galyardt and J. L. Renner,
Denver, Colorado**

Contents

Hot-Spring Data Sheets

Hot water greater than 150°C

Hot water from 90° to 150°C

References

IN RECORD # 99 MIRRORED ON 3/76
NAME: ROUTT HOT SPRING, CO RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARING FIG: 2 NUMBER: 002 DATE: 04/75

LOCATION:

STATE: CO COUNTY: ROUTT
LATITUDE: 40 33.60 TOWNSHIP: 07N
LONGITUDE: 106 51.00 RANGE: 84W
ELEV: 7430 SECTION: 18 SW1/4 SE1/4 B&M: 6TH PM.
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: PRECAMBRIAN GNEISS AND PEGMATITE
SURFACE DISCHARGE TOTAL: 511.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 3

TEMPERATURE: RANGE OF SPRING TEMP. 64 C TO

MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/12 SOURCE: GEORGE, 1920

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
64	0.0	0.00	88.40	162.20	11.14	7.58	43.5	136.9	141

OTHER CHEMICAL DATA 1912

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
127.0	130.8	101.6	168.5	136.7

RESERVOIR PROPERTIES

RANGE IN RES TEMP 0 C TO 0 C ASSUMED

BEST EST. AVER. TEMP 135.0

AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.00 KM TO 1.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.16 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: GEORGE, 1920; WARING, 1965; KUCERA, 1968

TOPO MAPS: 1:24,000 ROCKY PEAK

SPRING IDENTIFIED: YES

COMMENTS:

CHEMICAL DATA NOT RELIABLE

PREPARED BY: GALYARDT & RENNER

NAME: ROUTT HOT SPRING, CO

128

INR RECORD # 100 MIRRORED ON 3/76
NAME: STEAMBOAT SPRINGS, COLO RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 2 NUMBER: 2A DATE: 04/75

LOCATION:

STATE: COLO COUNTY: ROUTT
LATITUDE: 40 29.10 TOWNSHIP: 06N
LONGITUDE: 106 50.30 RANGE: 84W
ELEV: 6700 SECTION: 17 NW1/4 NW1/4 8&M: 6TH P.M.
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: DAKOTA SANDSTONE - FAULTED

SURFACE DISCHARGE TOTAL: L/MIN

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.9 KM**2

APPROX. # OF HOT SPRINGS: 150 (7 ON TOPO)

TEMPERATURE: RANGE OF SPRING TEMP. 38 C TO 66 C OR

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/12 SOURCE: GEORGE, 1920

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	MC03
24	0.0	0.00	84.80	2047.00	155.00	113.00	486.0	1345.0	3253

OTHER CHEMICAL DATA 1912 (GEORGE 1920) AVE. SI02 IN AREA 23 PPM.

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
125.1	128.6	99.1	195.4	227.3

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 200

BEST EST. AVER. TEMP 135.0

AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.16 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: GEORGE, 1920; WARING, 1965; KUCERA, 1968

TOPO MAPS: STEAMBOAT SPRINGS 1:24,000

SPRING IDENTIFIED: YES

COMMENTS:

CHEMICAL DATA NOT RELIABLE

PREPARED BY: RENNER, AND GALYARDT

NAME: STEAMBOAT SPRINGS, COLO

129

INR RECORD # 101 MIRRORED ON 3/76
NAME: IDAHO SPRINGS, COLO RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 2 NUMBER: 5 DATE: 04/75

LOCATION:

STATE: COLO COUNTY: CLEAR CREEK
LATITUDE: 39 44.20 TOWNSHIP: 03S
LONGITUDE: 105 30.20 RANGE: 73W
ELEV: 7600 SECTION: 36 SE1/4 SE1/4 B&M: 6TH P.M.
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: FRACTURED SYENITE
SURFACE DISCHARGE TOTAL: 189.3 L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 8

TEMPERATURE: RANGE OF SPRING TEMP. 36 C TO 50 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 04/68 SOURCE: MALLORY & BARNETT, OPEN FILE 1973

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
50	0.0	0.00	58.00	500.00	77.00	138.00	400.0	65.0	0

OTHER CHEMICAL DATA SEE MALLORY & BARNETT FOR MINOR ELEMENTS, ALSO GEORGE, 1920

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
108.6	109.4	77.9	207.6	153.9

RESERVOIR PROPERTIES

RANGE IN RES TEMP 75 C TO 200 C ASSUMED
BEST EST. AVER. TEMP 115.0
AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON ESTIMATE
DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.00 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MOARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS: BATHS

REFERENCES: SPURR & GARREY, 1908; TWETO, 1968; GEORGE, 1920; WARING, 1965; MALLORY & BARNETT, 1973

TOPO MAPS: IDAHO SPGS. 1:24,000

SPRING IDENTIFIED: NO

COMMENTS:

MOST LIKELY FAULT CONTROLLED. CHEMICAL DATA NOT RELIABLE

PREPARED BY: GALYARDT, RENNER

NAME: IDAHO SPRINGS, COLO

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INPUT RECORD # 102 MIRRORED ON 3/76
NAME: GLENWOOD SPGS .COLO RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 2 NUMBER: 006 DATE: 04/75

LOCATION:

STATE: COLO COUNTY: GARFIELD
LATITUDE: 39 33.00 TOWNSHIP: 06S
LONGITUDE: 107 19.30 RANGE: 89W
ELEV: 5740 SECTION: 9 .SE1/4 NE1/4 B&M: 6TH P.M.
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: BELDEN FM. (PENNSYLVANIAN) FAULTED: COPIUS BASALT & CINDER CONES (QUATERNARY)

SURFACE DISCHARGE TOTAL: 11360.0 L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 18.2 KM**2
APPROX. # OF HOT SPRINGS: 11

TEMPERATURE: RANGE OF SPRING TEMP. 66 C TO 23 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/12 SOURCE: GEORGE, 1920

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
41	53.0	8.50	99.60	7585.50	477.50	853.10	2693.0	11593.0	799

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
132.5	137.3	108.9	190.5	241.8

RESERVOIR PROPERTIES

RANGE IN RES TEMP 200 C TO 66 C ASSUMED
BEST EST. AVER. TEMP 140.0
AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.17 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS: SPA

REFERENCES: GEORGE, 1920; WARING, 1965; BASS AND NORTHRUP, 1963; LANDON, 1933

TOPO MAPS: GLENWOOD 1:24,000

SPRING IDENTIFIED: NO

COMMENTS:

SPGS OCCUR ALONG FAULTS WHICH CROSS THE COLO R. MEDIAN TEMP. 51 C. "AVE". SILICA IS NEAR 45PPM. SINCE SPGS OCCUR NEAR THE RIVER THERE MAY BE DILUTION BY FRESH WATER OR DOWNWARD CIRCULATION OF RIVER WATER ALONG THE FAULT DUE TO HEAD EXERTED BY WATER IN THE COLO. R. CHEMICAL DATA NOT RELIABLE.

PREPARED BY: GALYARDT, RENNER

NAME: GLENWOOD SPGS . COLO

INPH RECORD # 103 MIRRORED ON 3/76
NAME: AVALANCHE SPRINGS, COLO RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARING FIG: 2 NUMBER: 008 DATE: 04/75
LOCATION:
STATE: COLO COUNTY: PITKIN
LATITUDE: 39 13.90 TOWNSHIP: 09S
LONGITUDE: 107 13.50 RANGE: 88W
ELEV: 6920 SECTION: 33, SW1/4 1/4 8&M: 6TH P.M.
SURFACE MANIFESTATIONS: HOT SPRING(S),

ROCK AND STRUCTURE TYPE: SPGS ISSUE AT CONTACT OF GRANODIORITE & SEDI ROCKS
SURFACE DISCHARGE TOTAL: 53.9 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 5 IN .8KM TREND
TEMPERATURE: RANGE OF SPRING TEMP. 57 C TO 44 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH
CHEMICAL DATA ANALYSIS DATE 00/12 SOURCE: GEORGE, 1920
SPRING FLOW
TEMP L/MIN PH SI02 NA K CA S04 CL HC03
54 757.0 0.00 98.00 337.00 90.00 382.80 1214.0 259.9 473
OTHER CHEMICAL DATA
SI02 SI02 SI02 NA_K_CA OTHER
ADIABATIC CONDUCTIVE CHALCEDONY 1/3 4/3
131.8 136.4 107.9 223.3 124.6

RESERVOIR PROPERTIES
RANGE IN RES TEMP 100 C TO 225 C ASSUMED
BEST EST. AVER. TEMP 140.0
AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.17 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

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GEOPHYSICAL SURVEYS:
DEVELOPMENTS:
REFERENCES: GEORGE, 1920; WARING, 1965; OBRADOVICH AND OTHERS, 1969

TOPO MAPS: REDSTONE 1:24,000

SPRING IDENTIFIED: NO
COMMENTS:

SPGS. ARE ABOUT .35 MILES N. OF PENNY HOT SPGS SHOWN ON THE REDSTONE TOPO. THEY ARE NEXT TO THE RIVER (E. SIUE). CHEMICAL DATA NOT RELIABLE.

PREPARED BY: GALYARDT, RENNER

NAME: AVALANCHE SPRINGS, COLO

INR RECORD # 104 MIRRORED ON 3/76
NAME: COTTONWOOD SPRINGS ,COLO RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARNING FIG: 2 NUMBER: 019 DATE: 04/75

LOCATION:

STATE: CLO COUNTY:CHAFFEE
LATITUDE: 38 48.70 TOWNSHIP: 14S
LONGITUDE: 106 13.50 RANGE: 79W
ELEV: 8630 SECTION: 21 ,SE1/4 SE1/4 B&M: 6TH P.M.
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: GRANITE NEAR MONZONITE INTRUSION

SURFACE DISCHARGE TOTAL: 568.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 8.0 KM**2

APPROX. # OF HOT SPRINGS: 5

TEMPERATURE: RANGE OF SPRING TEMP. 50 C TO 62 C OR

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 09/68 SOURCE: MALLORY & BARNETT, 1973, ALSO GEORGE, 1920

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
57	0.0	0.00	55.00	108.00	2.60	5.60	108.0	28.0	0

OTHER CHEMICAL DATA MALLORY & BARNETT, SPECTROCHEM. ANALYSES WITH MINOR ELEMENTS

SI02	SI02	SI02	NA_K_CA	OTHER
ADIAHATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
106.4	106.8	75.1	117.0	83.2

RESERVOIR PROPERTIES

RANGE IN RES TEMP 75 C TO 125 C ASSUMED

BEST EST. AVER. TEMP 110.0

AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 4.0 KM**2

BASED ON ZEOLITIC ALTERATION, GEOLOGY

DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 6.00 KM**3

HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.34 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: GEORGE, 1920; WARING, 1965; SHARP 1970; MALLORY & BARNETT, 1973; SCOTT, 1975

TOPO MAPS: BUENA VISTA 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

EXTENSIVE ZEOLITIC ALTERATION ASSOCIATED WITH FORMER HOT SPRING ACTIVITY.

PREPARED BY: GALYARDT, RENNER

NAME: COTTONWOOD SPRINGS . COLO

IN RECORD # 105 MIRRORED ON 3/76
NAME: MT. PRINCETON SPRINGS, COLO RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 2 NUMBER: 20 DATE: 04/75

LOCATION:

STATE: COLO COUNTY: CHAFFEE
LATITUDE: 38 43.90 TOWNSHIP: 15S
LONGITUDE: 106 10.20 RANGE: 78W
ELEV: 8150 SECTION: 19 SW1/4 NW1/4 B&M: 6TH P.M.
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: TERTIARY QTZ MONZONITE
SURFACE DISCHARGE TOTAL: 189.3 L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 8.0 KM**2

APPROX. # OF HOT SPRINGS: 4 MAIN, 30 OTHERS
TEMPERATURE: RANGE OF SPRING TEMP. 36 C TO 65 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 09/68 SOURCE: MALLORY & BARNETT OPEN FILE 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HCO3
54	0.0	0.00	61.00	57.00	1.70	10.00	64.0	0.4	0

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY		
110.7	111.8	80.6	1/3 113.3	4/3 52.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 50 C TO 120
BEST EST. AVER. TEMP 115.0
AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 5.0 KM**2
BASED ON SURFACE EXPRESSION OF ZEOLITIZATION, GEOLOGY
DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 7.50 KM**3
HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.45 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS: SPA, VERY SHALLOW WELLS, SPACE HEAT

REFERENCES: GEORGE, 1920; SHARP, 1970; WARING, 1965; MALLORY & BARNETT, 1973; SCOTT AND OTHERS, 1975

TOPO MAPS: PONCHA SPGS 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

ZEOLITIZATION PRESENT OVER 8KM2 BUT PROBABLY IS OLDER AND NOT ONGOING. HOWEVER THE WATERS ARE PRESENTLY REPORTED TO BE DEPOSITING CALCITE, OPAL AND PHILLIPSITE

PREPARED BY: GALYARDT, RENNER

NAME: MT. PRINCETON SPRINGS, COLO

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INP RECORD # 106 MIRRORED ON 3/76
NAME: PONCHA HOT SPRINGS, COLO RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 2 NUMBER: 021 DATE: 04/75

LOCATION:

STATE: COLO COUNTY: CHAFFEE
LATITUDE: 38 29.90 TOWNSHIP: 49N
LONGITUDE: 106 4.50 RANGE: 09E
ELEV: 7960 SECTION: 15 SW1/4 SW1/4 B&M: N.M. P.M.
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: PRECAMBRIAN, GRANITE, GNEISS; SEDIMENTARY INFILL
SURFACE DISCHARGE TOTAL: 1893.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 3

TEMPERATURE: RANGE OF SPRING TEMP. 30 C TO 76 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/74 SOURCE: WRD 1974 UNPUBLISHED

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
66	1.9	0.00	86.00	200.00	8.60	16.00	190.0	51.0	218

OTHER CHEMICAL DATA MALLORY & BARNETT, 1973, GEORGE, 1920

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
125.7	129.3	100.0	143.2	108.4

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 150 C ASSUMED

BEST EST. AVER. TEMP 145.0

AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.18 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MURCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS: UNDERGROUND COLLECTION SYSTEM OF NATURAL FLOW, SPA, SWIMMING POOL

REFERENCES: WHITE, 1955; KNEPPER, 1974; RUSSELL, 1950; MALLORY AND BARNETT, 1973; GEORGE, 1920; WARING, 1965; VAN ALSTINE, 1969, 1974, 1975; SCOTT AND OTHERS, 1975; COX, 1945

TOPO MAPS: BONANAZA 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

EAST MOUND ONE GULLY OVER FROM THE IDENTIFIED WEST MOUNT (TOPO). ACTUAL DISCHARGE AND SPRINGS OBSCURED BY UNDERGROUND COLLECTION SYSTEM. ASSOCIATED WITH FLOURITE DEPOSITS. NA-K-CA TEMP. MAY BE TOO HIGH

PREPARED BY: GALYARDT, RENNER

NAME: PONCHA HOT SPRINGS • COLO

INR RECORD # 107 MIRRORED ON 3/76
NAME: MINERAL (CHAMBERLAIN) HOT WELL, COLO RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 2 NUMBER: 023 DATE: 04/75

LOCATION:
STATE: COLO COUNTY: SAGUACHE
LATITUDE: 38 10.10 TOWNSHIP: 45N
LONGITUDE: 105 55.00 RANGE: 10E
ELEV: 7747 SECTION: 7 NE1/4 1/4 H&M: NMPM
SURFACE MANIFESTATIONS: SINTER, TRAVERTINE, HOT SPRING(S).

EARBY ROCK AND STRUCTURE TYPE: GRABEN, FAULTS ACTIVE MIOCENE TO PRESENT; VALLEY FILL; UPPER TERTIARY VOLCANICS N

SURFACE DISCHARGE TOTAL: 189.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 30
TEMPERATURE: RANGE OF SPRING TEMP. 46 C TO 63 C OR
MAX. WELL TEMP 60 C AT 354 M DEPTH BOTTOM HOLE TEMP. C AT 354 M DEPTH
CHEMICAL DATA ANALYSIS DATE 09/74 SOURCE: WRD 1974 UNPUBLISHED (FLOWING WELL)

SPRING FLOW
TEMP L/MIN PH SIO2 NA K CA SO4 CL MC03
63 132.5 7.00 51.00 140.00 14.00 56.00 160.0 39.0 348
OTHER CHEMICAL DATA SEE MALLORY & BARNETT FOR MINOR ELEMENTS, 1973; GEORGE, 1920
SIO2 SIO2 SIO2 NA_K_CA OTHER
ADIABATIC CONDUCTIVE CHALCEDONY 1/3 4/3
103.3 103.3 71.2 168.2 91.3

RESERVOIR PROPERTIES
RANGE IN RES TEMP 70 C TO 170 C ASSUMED
BEST EST. AVER. TEMP 105.0
AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.12 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

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GEOPHYSICAL SURVEYS: GRAVITY, DC RESISTIVITY
DEVELOPMENTS: 1 WELL - IRRIG, SPA.
REFERENCES: LIPMAN, STEVEN, AND MEHNERT, 1970; JORDAN, 1974; KNEPPER, 1974; SIEBENTHAL, 1910; POWELL, 1958; GEORGE, 1920; MALLORY & BARNETT, 1973; GACA AND KARIG, 1965; KLEIN, 1971; SCOTT, 1970, WARING, 1965
TOPO MAPS: VILLA GROVE 1:24,000

SPRING IDENTIFIED: YES
COMMENTS:
JORDAN, COLO. SCH. MINES MS THESIS, 1974, HAS GEOPHYSICS FOR THE MINERAL HOT SPGS, VALLEY VIEW HOT SPGS AREA.

PREPARED BY: GALYARDT, RENNER

NAME: MINERAL (CHAMBERLAIN) HOT WELL, COLO

IM RECORD # 108 MIRRORED ON 3/76
NAME: WAUNITA (LOWER SPG.) , COLO RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARING FIG: 2 NUMBER: 014 DATE: 04/75

LOCATION:

STATE: COLO COUNTY: GUNNISON
LATITUDE: 38 31.00 TOWNSHIP: 49N
LONGITUDE: 106 29.10 RANGE: 04E
ELEV: 8940 SECTION: 11 , SW1/4 SW1/4 B&M: N M P M
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: DAKOTA SANDSTONE, MAJOR THRUST FAULT; UPPER TERTIARY QUARTZ MONZONITE FLOW
SURFACE DISCHARGE TOTAL: 3785.0 L/MIN MEASURED X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 2 GROUPS MORE THAN 100 SPRINGS
TEMPERATURE: RANGE OF SPRING TEMP. 71 C TO 60 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/12 SOURCE: GEORGE, 1920

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
70	37.8	0.00	85.70	154.60	2.50	5.40	182.0	27.4	175

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
125.6	129.2	99.8	106.4	86.8

RESERVOIR PROPERTIES

RANGE IN RES TEMP 80 C TO 140 C ASSUMED
BEST EST. AVER. TEMP 130.0
AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.16 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: GEORGE, 1920; STARK & BEHRE, 1936; GODWIN AND GASKILL, 1964; OBRADOVICH AND OTHERS, 1969

TOPO MAPS: PITKIN 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

PREPARED BY: GALYARDT, RENNER

NAME: WAUNITA (LOWER SPG.) , COLO

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INR RECORD # 109 MIRRORED ON 3/76
NAME: CEBOLLA (POWDERHORN), COLO RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 2 NUMBER: 015 DATE: 04/75

LOCATION:

STATE: COLO COUNTY: GUNNISON
LATITUDE: 38 16.50 TOWNSHIP: 46N
LONGITUDE: 107 5.90 RANGE: 02W
ELEV: 8085 SECTION: 4 .NW1/4 NE1/4 B&M: N M P M
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: CIMMARON FAULT, 35 MI EXTENSION; PRECAMBRIAN METAMORPHIC & IGNEOUS OLIGOCENE FLOW
S OF S. JUAN VOLCANIC FIELD

SURFACE DISCHARGE TOTAL: 378.5 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 20 IN 2 GROUPS
TEMPERATURE: RANGE OF SPRING TEMP. 26 C TO 46 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/12 SOURCE: GEORGE, 1920

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03
46	7.6	0.00	79.50	267.20	74.70	133.30	132.0	120.0	1107

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
122.2	125.2	95.3	232.8	143.8

RESERVOIR PROPERTIES

RANGE IN RES TEMP 95 C TO 235 C ASSUMED
BEST EST. AVER. TEMP 130.0
AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.16 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: GEORGE, 1920; WARING, 1965; OLSON AND WALLACE, S. R., 1956; HEDLUND AND OLSON, 1975

TOPO MAPS: POWDERHORN 1:24,000

SPRING IDENTIFIED: YES

COMMENTS:

CHEMICAL DATA NOT RELIABLE

PREPARED BY: GALYARDT, RENNER

NAME: CEBOLLA (POWDERHORN) . COLO

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IN RECORD # 110 MIRRORED ON 3/76
NAME: ORVIS (RIDGWAY) , COLO RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 2 NUMBER: 027 DATE: 04/75

LOCATION:

STATE: COLO COUNTY: OURAY
LATITUDE: 38 8.00 TOWNSHIP: 45N
LONGITUDE: 107 44.00 RANGE: 08W
ELEV: 7060 SECTION: 22 .SE1/4 SW1/4 H&M: N M P M
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: ALLUVIUM OVERLYING FAULTED PENNSYLVANIAN STRATA
SURFACE DISCHARGE TOTAL: 1136.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 1

TEMPERATURE: RANGE OF SPRING TEMP. 58 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/12 SOURCE: GEORGE 1920
SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
58	1136.0	0.00	57.50	374.00	102.00	274.10	1287.0	103.0	278

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
108.3	108.9	77.4	230.6	141.2

RESERVOIR PROPERTIES

RANGE IN RES TEMP 75 C TO 235 C ASSUMED
BEST EST. AVER. TEMP 110.0
AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.00 TO 0.10 E18 CAL; BEST ESTIMATE 0.13 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: GEORGE, 1920; WARING, 1965

TOPO MAPS: DALLAS 1:24,000

SPRING IDENTIFIED: YES

COMMENTS:

CHEMICAL DATA NOT RELIABLE

PREPARED BY: GALYARDT, RENNER

NAME: ORVIS (RIDGWAY) , COLO

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IN RECORD # 111 MIRRORED ON 3/76
NAME: WAGON WHEEL GAP, COLO RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARING FIG: 2 NUMBER: 031 DATE: 04/75

LOCATION:

STATE: COLO COUNTY: MINERAL
LATITUDE: 37 45.00 TOWNSHIP: 40N
LONGITUDE: 106 49.25 RANGE: 01E
ELEV: 8485 SECTION: 2, NE1/4 1/4 B&M: N.M.P.M.
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: NE OF CREEDE CALDERA (OLIGOCENE) GRANITE CUT BY DIKES, CAPPING VOLCANIC FLOWS (OLIGOCENE), FLUORITE

SURFACE DISCHARGE TOTAL: 378.5 L/MIN MEASURED X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 3

TEMPERATURE: RANGE OF SPRING TEMP. 66 C TO 57 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 09/68 SOURCE: MALLORY & BARNETT, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
57	189.3	7.00	86.00	462.00	46.00	65.00	165.0	231.0	976

OTHER CHEMICAL DATA SPECT. ANALYSES FOR MINOR ELEMENTS, MALLORY AND BARNETT, 1973; ALSO GEORGE, 1920

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
125.7	129.3	100.0	188.0	152.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 190 C ASSUMED
BEST EST. AVER. TEMP 135.0
AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.16 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS: SPA

REFERENCES: STEVEN AND RATTE, 1973; WARING, 1965; MALLORY & BARNETT, 1973; WHITE, 1955; EMMONS AND LARSEN, 1913

TOPO MAPS: SPAR CITY, CREEDE 1:62,500

SPRING IDENTIFIED: NO

COMMENTS:

ASSOCIATED WITH A MINERALIZED FISSURE, AND FLUORITE DEPOSITS VEIN ITSELF CONTAINS ANOMALOUS CONCENTRATIONS OF A G & AU. SILICEOUS SINTER DEPOSIT ALONG FISSURE AT A HIGHER ELEV. WHERE SPG ISSUED IN THE GEOL. PAST. NA-K-CA T EMP PROBABLY TOO HIGH

PREPARED BY: GALYARDT, RENNER

NAME: WAGON WHEEL GAP, COLO

INFO RECORD # 112 MIRRORED ON 3/76
NAME: PAGOSA (ARLINGTON HOTEL WELL) • COLO RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 2 NUMBER: 39, 40 DATE: 04/75

LOCATION:

STATE: COLO COUNTY: ARCHULETA
LATITUDE: 37 15.50 TOWNSHIP: 35N
LONGITUDE: 107 0.50 RANGE: 02W
ELEV: 7060 SECTION: 13 ,SE1/4 SW1/4 H&M: N.M.P.M.
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: BEDROCK UPPER CRETACEOUS MANCOS SHALE, MAJOR FAULT
SURFACE DISCHARGE TOTAL: 380.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP. 60 C TO 70 C OR
MAX. WELL TEMP 60 C AT 118 M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/12 SOURCE: GEORGE, 1920
SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
60	378.5	0.00	160.20	607.00	260.00	230.20	1494.0	200.5	631

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
156.1	165.5	141.1	277.6	204.5

RESERVOIR PROPERTIES

RANGE IN RES TEMP 140 C TO 280 C ASSUMED
BEST EST. AVER. TEMP 150.0
AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.20 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MURPHY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS: 1 WELL, SPACE HEAT
REFERENCES: WARING, 1965; GEORGE, 1920; WOOD, G. M., KELLY V.C. AND MAC ALPIN, 1948

TOPO MAPS: PAGOSA 1:24,000

SPRING IDENTIFIED: YES

COMMENTS:

CHEMICAL DATA NOT RELIABLE

PREPARED BY: GALYARDT, RENNER

NAME: PAGOSA (ARLINGTON HOTEL WELL) • COLO

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Selected Geothermal Resources Assessment Data

Hydrothermal Convection Systems in Hawaii

By: D. E. White, Menlo Park, California

and

J. L. Renner, Denver, Colorado

Contents

Hot-Spring Data Sheets

Hot water greater than 150°C

Hot water from 90° to 150°C

References

IN RECORD # 113 MIRRORED ON 3/76
NAME: STEAMING FLATS AREA (SULPHUR BANK AREA) ,HAWAII RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 10 NUMBER: 4 DATE: 04/75

LOCATION:

STATE: HAWAII COUNTY: HAWAII
LATITUDE: 19 26:50 TOWNSHIP:
LONGITUDE: 155 16.00 RANGE:
ELEV: 3960 SECTION: , 1/4 1/4 8&M:
SURFACE MANIFESTATIONS: FUMAROLE OR WARM VAPOR,

ROCK AND STRUCTURE TYPE: BASALT
SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 5.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP. 97 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE:

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HCO3
0	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
0.0	0.0	0.0	0.0	0.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 240 C ASSUMED

BEST EST. AVER. TEMP 150.0

AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.18 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1965; WHITE AND WARING, 1963, PETERSON, 1967

TOPO MAPS: KILAUEA CRATER 1:24,000

SPRING IDENTIFIED: YES

COMMENTS:

THIS SYSTEM MAY BE HOTTER AND MORE EXTENSIVE. THE SYSTEM MAY BE SHALLOWER AND THINNER IF SIMILAR TO THE KILAUEA
A DRILL HOLE AREA; FUMAROLE TEMPERATURE = 97C

PREPARED BY: J. L. RENNER; D. E. WHITE

NAME: STEAMING FLATS AREA (SULPHUR BANK AREA) , HAWAII

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IN RECORD # 114 MIRRORED ON 3/76
NAME. UPPER KAU AREA, HAWAII RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 04/75

LOCATION:

STATE: HAWAII COUNTY: HAWAII
LATITUDE: 19 23.70 TOWNSHIP:
LONGITUDE: 155 17.30 RANGE:
ELEV: 3616 SECTION: , 1/4 1/4 H&M:

SURFACE MANIFESTATIONS: FOUND BY RESISTIVITY ANOMALY.

ROCK AND STRUCTURE TYPE: BASALT
SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP. 22 C OR

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. 37 C AT 1262 M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE:

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
0	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0

OTHER CHEMICAL DATA

SI02 ADIABATIC	SI02 CONDUCTIVE	SI02. CHALCEDONY	NA_K_CA	OTHER
0.0	0.0	0.0	1/3 0.0 4/3 0.0	

RESERVOIR PROPERTIES

RANGE IN RES TEMP 0 C TO 0 MEASURED

BEST EST. AVER. TEMP 100.0

AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 5.0 KM**2

BASED ON RESISTIVITY ANOMALY

DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 0.50 KM.

DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 1.20 KM.

THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 0.70 KM.

VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 3.50 KM**3

HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.18 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS: MICROEARTHQUAKES, ELECTROMAGNETIC SOUNDING

DEVELOPMENTS: ONE RESEARCH WELL OF ABOUT 1262 M.

REFERENCES: ZABLOCKI, C. J. AND OTHERS 1974; JACKSON & KELLER, 1972; PETERSON, 1967

TOPO MAPS: KILAUEA CRATER 1:24,000

SPRING IDENTIFIED:NO

COMMENTS:

RESISTIVITY ANOMALY DRILLED BY NSF GRANT TO G.V. KELLER, 1973. IDENTIFIED A LOW TEMPERATURE CONVECTION SYSTEM.
CONVECTIVE ZONE FROM 490M TO 1150M THEN STEEP CONDUCTIVE. GRADIENT PRESUMABLY TO NEAR BASALTIC MAGMA TEMPERAT
URE

PREPARED BY: J. RENNER, D. E. WHITE

NAME: UPPER KAU AREA , HAWAII

IN RECORD # 115 MIRRORED ON 3/76
NAME: 1955 ERUPTION AREA (EAST RIFT) , HI RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 06/75

LOCATION:

STATE: HI COUNTY: HAWAII
LATITUDE: 19 26.50 TOWNSHIP:
LONGITUDE: 154 57.00 RANGE:
ELEV: 0 SECTION: , 1/4 1/4 B&M:

SURFACE MANIFESTATIONS:

ROCK AND STRUCTURE TYPE:
SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP. HOT

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE:

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HCO3
0	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIAHATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
0.0	0.0	0.0	0.0	0.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 0 C TO 0 C ASSUMED

BEST EST. AVER. TEMP 150.0

AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 2.0 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.00 KM.

DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 2.00 KM.

VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 4.00 KM**3

HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.32 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS: 3 WELLS DRILLED 1961; DEEPEST 210 M, 113 C

REFERENCES:

TOPO MAPS: PAHOA SOUTH 1:24,000

SPRING IDENTIFIED:

COMMENTS:

STEAMING AREA, NSF GRANT 1975 TO UNIVERSITY OF HAWAII FOR DEEP TEST

PREPARED BY: D. E. WHITE

NAME: 1955 ERUPTION AREA (EAST RIFT) , HI

INP RECORD # 116 MIRRORED ON 3/76
NAME: PUULENA AREA (EAST RIFT) HI RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 06/75

LOCATION:
STATE: HI COUNTY: HAWAII
LATITUDE: 19 28.30 TOWNSHIP:
LONGITUDE: 154 53.00 RANGE:
ELEV: 0 SECTION: 1/4 1/4 H&M:
SURFACE MANIFESTATIONS: NO VISIBLE MANIFESTATION.

ROCK AND STRUCTURE TYPE:
SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP.
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE:
SPRING FLOW
TEMP L/MIN PH SIO2 NA K CA SO4 CL HCO3
0 0.0 0.00 0.00 0.00 0.00 0.00 0.00 0.0 0

OTHER CHEMICAL DATA
SIO2 SIO2 SIO2 NA_K_CA OTHER
ADIABATIC CONDUCTIVE CHALCEDONY 1/3 4/3
0.0 0.0 0.0 0.0 0.0

RESERVOIR PROPERTIES
RANGE IN RES TEMP 0 C TO 0 C ASSUMED
BEST EST. AVER. TEMP 150.0
AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 2.0 KM**2
BASED ON
DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.00 KM.
DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 2.00 KM.
VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 4.00 KM**3
HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.32 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:
DEVELOPMENTS:
REFERENCES:

TOPO MAPS: PAHOA SOUTH 1:24,000

SPRING IDENTIFIED:NO
COMMENTS:
NO SURFACE MANIFESTATIONS. GEOPHYSICAL ANOMALIES IDENTIFIED

PREPARED BY:D. E. WHITE

NAME: PUULENA AREA (EAST RIFT) HI

References cited - Hawaii

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- Zablocki, C. J., Tilling, R. I., Peterson, D. W., Christiansen, R. L., Keller, G. V., and Murray, J. C., 1974, A deep research drill hole at the summit of an active volcano, Kilauea, Hawaii: Geophys. Research Letters, v. 1, no. 7, p. 323-326.

Selected Geothermal Resources Assessment Data

Hydrothermal Convection Systems in Idaho

By: HansPeter Oberlindacher, Menlo Park, California

J. L. Renner, Denver, Colorado

and

K. E. Telleen, Menlo Park, California

Contents

Hot-Spring Data Sheets

Hot water greater than 150°C

Hot water from 90° to 150°C

References

INPUT RECORD # 117 MIRRORED ON 3/76
NAME: BIG CREEK H.S. , ID RESOURCE CATAGORY: HOT WATER > 150 C
WARING FIG: 4 NUMBER: 052 DATE: 02/75

LOCATION:

STATE: ID COUNTY: LEMHI
LATITUDE: 45 18.76 TOWNSHIP: 23N
LONGITUDE: 114 19.24 RANGE: 18E
ELEV: 5570 SECTION: 22 , 1/4 SW1/4 B&M: BOISE
SURFACE MANIFESTATIONS: SINTER, TRAVERTINE, HOT SPRING(S),

ROCK AND STRUCTURE TYPE: CRETACEOUS GRANITIC ROCKS
SURFACE DISCHARGE TOTAL: 284.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP. 15 C TO 82 C OR 93.0
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
93	0.0	7.50	150.00	220.00	14.00	5.30	53.0	29.0	488

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
152.7	161.4	136.3	172.9	163.5

RESERVOIR PROPERTIES

RANGE IN RES TEMP 150 C TO 180 C ASSUMED

BEST EST. AVER. TEMP 175.0

AREA 1.0 TO 3.0 KM**2; BEST ESTIMATE 2.0 KM**2

BASED ON GEOLOGY

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 6.00 KM**3; BEST ESTIMATE 3.00 KM**3

HEAT CONTENT > 15 C 0.08 TO 0.57 E18 CAL; BEST ESTIMATE 0.29 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1965; YOUNG AND MITCHELL, 1973

TOPO MAPS: SHOUP 1:62,500, ELK CITY 1:250,000

SPRING IDENTIFIED:

COMMENTS:

MIXING MODELS SUGGESTS 220C

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: BIG CREEK H.S. , ID

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INPUT RECORD # 118 MIRRORED ON 3/76
NAME: SHARKEY H.S. , ID RESOURCE CATAGORY: HOT WATER > 150 C
WARING FIG: 7 NUMBER: 060 DATE: 02/75

LOCATION:
STATE: ID COUNTY: LEMHI
LATITUDE: 45 0.94 TOWNSHIP: 20N
LONGITUDE: 113 51.10 RANGE: 24E
ELEV: 5550 SECTION: 34 SW1/4 SW1/4 B&M: BOISE
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: OLIGOCENE SILICIC VOLC. ROCKS
SURFACE DISCHARGE TOTAL: 30.0 L/MIN MEASURED X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE Ex: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP. 52 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
52	0.0	7.40	91.00	270.00	17.00	7.30	160.0	51.0	470

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
128.3	132.4	103.4	173.2	166.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 135 C TO 180 C ASSUMED
BEST EST. AVER. TEMP 175.0
AREA 1.0 TO 3.0 KM**2; BEST ESTIMATE 2.0 KM**2
BASED ON GEOLOGY
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 6.00 KM**3; BEST ESTIMATE 3.00 KM**3
HEAT CONTENT > 15 C 0.07 TO 0.59 E18 CAL; BEST ESTIMATE 0.29 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: ANDERSON, 1957; WARING, 1965; YOUNG AND MITCHELL, 1973

TOPO MAPS: GOLDSTONE MTN. 1:62,500, DILLON 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

NA-K-CA TEMPERATURE MAY BE INNACCURATE, MAY BE SINTER DEPOSITON, MIXING TEMPERATURE 220C

PREPARED BY: PETER OBERLINDACHER, J. RENNEN

NAME: SHARKEY H.S. , ID

155

INPUT RECORD # 119 MIRRORED ON 3/76
NAME: WEISER ,ID RESOURCE CATAGORY: HOT WATER > 150 C
WARNING FIG: 4 NUMBER: 021 DATE: 04/75

LOCATION:

STATE: ID COUNTY: WASHINGTON
LATITUDE: 44 17.90 TOWNSHIP: 11N
LONGITUDE: 117 2.90 RANGE: 06W
ELEV: 2200 SECTION: 14 , 1/4 1/4 B&M: BOISE
SURFACE MANIFESTATIONS: HOT SPRING(S),

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM, IDAHO GROUP (PLEISTOCENE & PLIOCENE)

SURFACE DISCHARGE TOTAL: 20.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: NUMEROUS

TEMPERATURE: RANGE OF SPRING TEMP. 25 C TO 77 C OR

MAX. WELL TEMP 77 C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: YOUNG AND WHITEHEAD, 1974B

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
0	0.0	9.30	140.00	140.00	5.00	2.90	150.0	56.0	35

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
149.2	157.2	131.4	142.3	127.6

RESERVOIR PROPERTIES

RANGE IN RES TEMP 130 C TO 250 C ASSUMED

BEST EST. AVER. TEMP 160.0

AREA 9.0 TO 120.0 KM**2; BEST ESTIMATE 35.0 KM**2

BASED ON AMT., GEOLOGY

DEPTH TO TOP OF RES. 0.50 KM TO 2.00 KM; BEST ESTIMATE 1.00 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.50 KM; BEST ESTIMATE 2.00 KM.

VOLUME 9.00 TO 300.00 KM**3; BEST ESTIMATE 70.00 KM**3

HEAT CONTENT > 15 C 0.60 TO 42.00 E18 CAL; BEST ESTIMATE 6.10 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS: GRAVITY, MAG, AMT, TEMPERATURE GRADIENT

DEVELOPMENTS:

REFERENCES: NEWCOMB, 1970; YOUNG & WHITEHEAD, 1974B

TOPO MAPS: OLDS FERRY SE 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

GEOPHYSICAL EVIDENCE SUGGESTS CRANE CREEK AND WEISER MAY BE INTERCONNECTED. MIXING MODEL INDICATES 228C POSSIBLE.

PREPARED BY: PETER OBERLINDACHER, J. RENNER, D. WILLIAMS

NAME: WEISER , ID

156

INPUT RECORD # 120 MIRRORED ON 3/76
NAME: CRANE CREEK ,ID RESOURCE CATAGORY: HOT WATER > 150 C
WARNING FIG: NUMBER: DATE: 04/75

LOCATION:
STATE: ID COUNTY: WASHINGTON
LATITUDE: 44 18.30 TOWNSHIP: 11N
LONGITUDE: 116 44.70 RANGE: 03W
ELEV: 2400 SECTION: 7 . 1/4 1/4 B&M: HOISE
SURFACE MANIFESTATIONS: SINTER, TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: IDAHO GROUP UNDIFFERENTIATED
SURFACE DISCHARGE TOTAL: 200.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS:
TEMPERATURE: RANGE OF SPRING TEMP. 57 C TO 92 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: YOUNG AND WHITEHEAD, 1974B

SPRING FLOW
TEMP L/MIN PH SIO2 NA K CA SO4 CL MC03
77 0.0 7.10 180.00 290.00 19.00 26.00 250.0 300.0 190

OTHER CHEMICAL DATA

SIO2 SIO2 SIO2 NA_K_CA OTHER
ADIABATIC CONDUCTIVE CHALCEDONY 1/3 4/3
162.4 173.1 149.8 165.5 132.5

RESERVOIR PROPERTIES

RANGE IN RES TEMP 150 C TO 270 C ASSUMED
BEST EST. AVER. TEMP 180.0
AREA 20.0 TO 100.0 KM**2; BEST ESTIMATE 30.0 KM**2
BASED ON AMT., GEOLOGY
DEPTH TO TOP OF RES. 0.50 KM TO 2.00 KM; BEST ESTIMATE 1.00 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.50 KM; BEST ESTIMATE 2.00 KM.
VOLUME 20.00 TO 250.00 KM**3; BEST ESTIMATE 60.00 KM**3
HEAT CONTENT > 15 C 1.60 TO 38.00 E18 CAL; BEST ESTIMATE 5.90 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS: GRAVITY, MAG, AMT
DEVELOPMENTS:
REFERENCES: NEWCOMB, 1970; YOUNG AND WHITEHEAD, 1974B

TOPO MAPS: CRANE CREEK RES. 1:62,500; BAKER. ORE. 1:250,000

SPRING IDENTIFIED: NO

COMMENTS:

MIXING MODELS INDICATE POSSIBLE RESERVOIR OF 239C; EXTENSIVE SINTER IN AREA OF MERCURY MINERALIZATION, MAY BE CONNECTED AT DEPTH TO WEISER

PREPARED BY: PETER OBERLINDACHER, J. RENNEN, D. WILLIAMS

NAME: CRANE CREEK . ID

INPUT RECORD # 121 MIRRORED ON 3/76
NAME: WELL NEAR CAMBRIDGE ,ID RESOURCE CATAGORY: HOT WATER > 150 C
WAKING FIG: NUMBER: DATE: 02/75
LOCATION:

STATE: ID COUNTY: WASHINGTON
LATITUDE: 44 34.39 TOWNSHIP: 14N
LONGITUDE: 116 40.66 RANGE: 03W
ELEV: 2680 SECTION: 3 SE1/4 SE1/4 8&M: BOISE
SURFACE MANIFESTATIONS:

ROCK AND STRUCTURE TYPE: MIOCENE BASALT
SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP.
MAX. WELL TEMP 25 C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW
TEMP L/MIN PH SIO2 NA K CA S04 CL HC03
26 0.0 8.70 70.00 73.00 6.80 2.60 15.0 1.0 157

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED

SIO2	SIO2	SIO2	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
116.6	118.6	88.1	180.0	134.6

RESERVOIR PROPERTIES

RANGE IN RES TEMP 110 C TO 190 C ASSUMED
BEST EST. AVER. TEMP 180.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.06 TO 0.42 E18 CAL; BEST ESTIMATE 0.22 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: NEWCOMB, 1970; YOUNG AND MITCHELL, 1973

TOPO MAPS: CAMBRIDGE 1:62,500

SPRING IDENTIFIED: NO

COMMENTS:

NA-K-CA MAY BE INACCURATE, SAMPLE FROM FLOWING WELL.

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: WELL NEAR CAMBRIDGE , ID

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INPUT RECORD # 122 MIRRORED ON 3/76
NAME: WARDROP H.S. ID RESOURCE CATAGORY: HOT WATER > 150 C
WARNING FIG: NUMBER: DATE: 02/75

LOCATION:

STATE: ID COUNTY: CAMAS
LATITUDE: 43 23.00 TOWNSHIP: 01N
LONGITUDE: 114 55.90 RANGE: 13E
ELEV: 0 SECTION: 32 NW1/4 NE1/4 B&M: HOISE

SURFACE MANIFESTATIONS: HOT SPRING(S),

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM NEAR PLEISTOCENE BASALT & CRETACEOUS GRANITIC ROCKS

SURFACE DISCHARGE TOTAL: 730.0 L/MIN MEASURED X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: NUMEROUS

TEMPERATURE: RANGE OF SPRING TEMP. 66 C TO

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
66	0.0	8.00	73.00	54.00	3.00	1.40	12.0	0.0	51

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
118.4	120.8	90.5	153.8	113.6

RESERVOIR PROPERTIES

RANGE IN RES TEMP 120 C TO 170 C ASSUMED

BEST EST. AVER. TEMP 155.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.06 TO 0.37 E18 CAL; BEST ESTIMATE 0.19 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: YOUNG AND MITCHELL, 1973; WALTON, 1962

TOPO MAPS: FAIRFIELD 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

MIXING MODEL SUGGESTS APPROX. 160 C, MAY BE PART OF A LARGER SYSTEM IN THE CAMAS PRAIRIE

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: WARDROP H.S. ID

159

INPUT RECORD # 123 MIRRORED ON 3/76
NAME: MURPHY H.S. ,ID RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 02/75

LOCATION:

STATE: IJ COUNTY: OWYHEE
LATITUDE: 42 2.20 TOWNSHIP: 16S
LONGITUDE: 115 32.40 RANGE: 09E
ELEV: 0 SECTION: 24 .NW1/4 NW1/4 H&M: BOISE
SURFACE MANIFESTATIONS: HOT SPRING(S),

ROCK AND STRUCTURE TYPE: PLIOCENE SILICIC VOLCANIC ROCKS
SURFACE DISCHARGE TOTAL: 265.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 2

TEMPERATURE: RANGE OF SPRING TEMP. 51 C OR

MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03
51	0.0	7.10	83.00	30.00	2.00	0.60	4.7	2.3	67

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
124.1	127.5	97.9	160.0	112.2

RESERVOIR PROPERTIES

RANGE IN RES TEMP 120 C TO 165 C ASSUMED

BEST EST. AVER. TEMP 160.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.06 TO 0.36 E18 CAL; BEST ESTIMATE 0.19 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: YOUNG AND MITCHELL, 1973

TOPO MAPS: TWIN FALLS 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

MIXING MODEL SUGGESTS 200C

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: MURPHY H.S. . ID

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INPUT RECORD # 124 MIRRORED ON 3/76
NAME: RED RIVER H.S. ,ID RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 4 NUMBER: 010 DATE: 03/75

LOCATION:

STATE: ID COUNTY: IDAHO
LATITUDE: 45 47.25 TOWNSHIP: 28N
LONGITUDE: 115 8.82 RANGE: 10E
ELEV: 5200 SECTION: 3, 1/4 SE1/4 H&M: HOISE
SURFACE MANIFESTATIONS: SINTER, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: CRETACEOUS GRANITIC RXS
SURFACE DISCHARGE TOTAL: 132.0 L/MIN MEASURED X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 9

TEMPERATURE: RANGE OF SPRING TEMP. 37 C TO 55 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03
55	0.0	8.60	76.00	81.00	1.60	2.70	44.0	4.4	36

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
120.2	122.9	92.7	110.3	80.1

RESERVOIR PROPERTIES

RANGE IN RES TEMP 80 C TO 130
BEST EST. AVER. TEMP 125.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.04 TO 0.28 E18 CAL; BEST ESTIMATE 0.15 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: YOUNG AND MITCHELL, 1973; WARING, 1965

TOPO MAPS: BLACK HAWK MTN. 1:24,000; ELK CITY 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4. IN GEOTHERMAL INVESTIGATIONS IN IDAHO. PART 1, 1973. IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30. MIXING MODEL T=190C

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: RED RIVER H.S. , ID

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INPUT RECORD # 125 MIRRORED ON 3/76
NAME: RIGGINS H.S. .ID RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 4 NUMBER: 013 DATE: 03/75
LOCATION:

STATE: ID COUNTY: IDAHO
LATITUDE: 45 24.70 TOWNSHIP: 24N
LONGITUDE: 116 28.49 RANGE: 02E
ELEV: 2000 SECTION: 14 ,NE1/4 SE1/4 H&M: BOISE
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM OVERLYING PALEOZOIC & MESOZOIC GNEISSES.

SURFACE DISCHARGE TOTAL: 189.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 4

TEMPERATURE: RANGE OF SPRING TEMP. 47 C OR

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03
42	0.0	8.60	72.00	160.00	3.40	6.20	300.0	8.0	11

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
117.8	120.1	89.7	116.6	94.7

RESERVOIR PROPERTIES

RANGE IN RES TEMP 95 C TO 130 C ASSUMED

BEST EST. AVER. TEMP 125.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.05 TO 0.27 E18 CAL; BEST ESTIMATE 0.15 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1965; YOUNG AND MITCHELL, 1973; HAMILTON, 1969

TOPO MAPS: RIGGINS SH.S. 1:24,000; ORANGEVILLE 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO PART 1, 1973. IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30. MIXING MODEL T=220C

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: RIGGINS H.S. .ID

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INPUT RECORD # 126 MIRRORED ON 3/76
NAME: BURGDORF H.S. ID RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARING FIG: 4 NUMBER: 014 DATE: 03/75

LOCATION:

STATE: ID COUNTY: IDAHO
LATITUDE: 45 16.74 TOWNSHIP: 22N
LONGITUDE: 115 55.19 RANGE: 04E
ELEV: 6100 SECTION: 1 SE1/4 NW1/4 B&M: 80ISE
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S),

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM NEAR CRETACEOUS GRANITIC ROCKS

SURFACE DISCHARGE TOTAL: 612.0 L/MIN MEASURED X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 2

TEMPERATURE: RANGE OF SPRING TEMP. 45 C OR

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
45	0.0	0.00	73.00	49.00	0.80	2.30	18.0	3.0	19

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY		
118.4	120.8	90.5	1/3 97.8	4/3 56.9

RESERVOIR PROPERTIES

RANGE IN RES TEMP 50 C TO 130 C ASSUMED

BEST EST. AVER. TEMP 125.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.02 TO 0.28 E18 CAL; BEST ESTIMATE 0.15 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1965; YOUNG AND MITCHELL, 1973

TOPO MAPS: BURGDORF 1:62,500; ELK CITY 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO PART 1, 1973. IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30.

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: BURGDORF H.S. , ID

INPUT RECORD # 127 MIRRORED ON 3/76
NAME: ZIM S RESORT HOT SPRINGS (YOGHANN) .ID RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 4 NUMBER: 016 DATE: 03/75

LOCATION:

STATE: ID COUNTY: ADAMS
LATITUDE: 45 2.56 TOWNSHIP: 20N
LONGITUDE: 116 17.02 RANGE: 01E
ELEV: 3950 SECTION: 26 .SE1/4 SE1/4 B&M: HOISE
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S),

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUV. NEAR MIOCENE BASALT
SURFACE DISCHARGE TOTAL: L/MIN

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP. 65 C TO HOT

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
65	0.0	8.50	64.00	190.00	3.60	12.00	330.0	32.0	47

OTHER CHEMICAL DATA TABLE 2 REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
112.8	114.2	83.2	110.0	83.4

RESERVOIR PROPERTIES

RANGE IN RES TEMP 80 C TO 125 C ASSUMED

BEST EST. AVER. TEMP 120.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.04 TO 0.26 E18 CAL; BEST ESTIMATE 0.14 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: HAMILTON, 1969; WARING, 1965; YOUNG AND MITCHELL, 1973

TOPO MAPS: BALLY MTN. 1:24,000; GRANGEVILLE 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO PART I, 1973. IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: ZIM S RESORT HOT SPRINGS (YOGHANN) . ID

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INPUT RECORD # 128 MIRRORED ON 3/76
NAME: KRIGBAUM H.S. ID RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 4 NUMBER: 017 DATE: 03/75
LOCATION:

STATE: ID COUNTY: ADAMS
LATITUDE: 44 58.11 TOWNSHIP: 19N
LONGITUDE: 116 11.43 RANGE: 02E
ELEV: 4700 SECTION: 22 .NW1/4 NW1/4 B&M: BOISE
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: CRETACEOUS GRANITIC NEAR MIOCENE BASALT
SURFACE DISCHARGE TOTAL: 151.0 L/MIN MEASURED X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 2

TEMPERATURE: RANGE OF SPRING TEMP. 43 C TO
MAX. WELL TEMP C AT M DEPTH. BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973
SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
43	0.0	8.80	73.00	140.00	3.30	5.30	190.0	26.0	81

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
AJIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
118.4	120.8	90.5	120.1	95.8

RESERVOIR PROPERTIES

RANGE IN RES TEMP 90 C TO 130 C ASSUMED
BEST EST. AVER. TEMP 125.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.05 TO 0.28 E18 CAL; BEST ESTIMATE 0.15 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: NEWCOMB, 1970; WARING, 1965; YOUNG AND MITCHELL, 1973

TOPO MAPS: BAKER 1:250,000

SPRING IDENTIFIED: NO

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO. PART 1, 1973. IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30. MIXING MODEL T=200C.

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: KRIGBAUM H.S. ID

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INPUT RECORD # 129 MIRRORED ON 3/76
NAME: STARKEY HOT SPRINGS .ID RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 04/75

LOCATION:

STATE: ID COUNTY: ADAMS
LATITUDE: 44 51.18 TOWNSHIP: 18N
LONGITUDE: 116 25.75 RANGE: 01W
ELEV: 3240 SECTION: 34 .NW1/4 SE1/4 B&M: BOISE
SURFACE MANIFESTATIONS: TRAVERTINE, OTHER SPRING DEPOSITS, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: MIOCENE BASALT
SURFACE DISCHARGE TOTAL: 491.0 L/MIN MEASURED X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 7

TEMPERATURE: RANGE OF SPRING TEMP. 56 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973
SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
56	0.0	8.60	56.00	86.00	1.60	4.50	150.0	0.0	60

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
107.2	107.7	76.1	105.5	69.8

RESERVOIR PROPERTIES

RANGE IN RES TEMP 70 C TO 125 C ASSUMED

BEST EST. AVER. TEMP 115.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.03 TO 0.26 E18 CAL; BEST ESTIMATE 0.13 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: LIVINGSTON AND LANEY, 1920; YOUNG AND MITCHELL, 1973

TOPO MAPS: NEW MEADOWS 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO, PART 1, 1973. IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: STARKEY HOT SPRINGS . ID

166

INPUT RECORD # 130 MIRRORED ON 3/76
NAME: WHITE LICKS HOT SPRINGS .ID RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 4 NUMBER: 019 DATE: 03/75

LOCATION:

STATE: ID COUNTY: ADAMS
LATITUDE: 44 40.92 TOWNSHIP: 16N
LONGITUDE: 116 13.75 RANGE: 02E
ELEV: 4872 SECTION: 33 SW1/4 NW1/4 B&M: HOISE
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: NEAR MIOCENE BASALT AND CRETACEOUS GRANITICS

SURFACE DISCHARGE TOTAL: 113.0 L/MIN MEASURED X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: NUMEROUS(8)

TEMPERATURE: RANGE OF SPRING TEMP. 65 C TO

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
65	0.0	7.60	110.00	420.00	17.00	39.00	660.0	0.0	71

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
137.2	142.9	115.2	144.9	121.6

RESERVOIR PROPERTIES

RANGE IN RES TEMP 130 C TO 155 C ASSUMED

BEST EST. AVER. TEMP 150.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.07 TO 0.34 E18 CAL; BEST ESTIMATE 0.18 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1965; YOUNG AND MITCHELL, 1973

TOPO MAPS: CASCADE 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO PART 1, 1973. IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30. MIXING MODEL T=220C. MAY BE PART OF A LARGER SYSTEM INCLUDING HOT SPRINGS NEAR COVE SCHOOL.

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: WHITE LICKS HOT SPRINGS . ID

167

INPUT RECORD # 131 MIRRORED ON 3/76
NAME: SPRINGS NEAR COVE SCHOOL ,ID RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 03/75

LOCATION:

STATE: ID COUNTY: WASHINGTON
LATITUDE: 44 35.00 TOWNSHIP: 14N
LONGITUDE: 116 37.73 RANGE: 02W
ELEV: 2720 SECTION: 6 ,NW1/4 NW1/4 B&M: BOISE
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM NEAR MIOCENE BASALT

SURFACE DISCHARGE TOTAL: 1630.0 L/MIN MEASURED X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: NUMEROUS

TEMPERATURE: RANGE OF SPRING TEMP. 70 C OR

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
70	0.0	7.80	72.00	200.00	3.80	17.00	200.0	140.0	24

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
117.8	120.1	89.7	108.6	78.1

RESERVOIR PROPERTIES

RANGE IN RES TEMP 80 C TO 130 C ASSUMED

BEST EST. AVER. TEMP 125.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.04 TO 0.28 E18 CAL; BEST ESTIMATE 0.15 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: NEWCOMB, 1970; YOUNG AND MITCHELL, 1973

TOPO MAPS: CAMBRIDGE 1:62,500

SPRING IDENTIFIED:NO

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO PART 1, 1973. IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: SPRINGS NEAR COVE SCHOOL , ID

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INPUT RECORD # 132 MIRRORED ON 3/76
NAME: SPRING NEAR DEER CREEK .ID RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARING FIG: NUMBER: DATE: 03/75
LOCATION:

STATE: ID COUNTY: WASHINGTON
LATITUDE: 44 32.36 TOWNSHIP: 14N
LONGITUDE: 116 45.00 RANGE: 03W
ELEV: 2720 SECTION: 19 ,NW1/4 SW1/4 B&M: HOISE
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM NEAR MIOCENE BASALT
SURFACE DISCHARGE TOTAL: 219.0 L/MIN MEASURED X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP. 50 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH
CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW
TEMP L/MIN PH SI02 NA K CA SO4 CL HCO3
50 0.0 8.50 55.00 80.00 1.90 8.00 110.0 15.0 81

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
106.4	106.8	75.1	110.2	62.7

RESERVOIR PROPERTIES

RANGE IN RES TEMP 65 C TO 115 C ASSUMED
BEST EST. AVER. TEMP 110.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.03 TO 0.24 E18 CAL; BEST ESTIMATE 0.13 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: NEWCOMB, 1970; YOUNG AND MITCHELL, 1973

TOPO MAPS: STURGILL PK 1:62,500; CAMBRIDGE 1:62,500

SPRING IDENTIFIED:NO

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO PART 1, 1973. IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30.

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: SPRING NEAR DEER CREEK . ID

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INPUT RECORD # 133 MIRRORED ON 3/76
NAME: WELL NEAR MIDVALE , ID RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 03/75

LOCATION:
STATE: ID COUNTY: WASHINGTON
LATITUDE: 44 28.33 TOWNSHIP: 13N
LONGITUDE: 116 43.88 RANGE: 03W
ELEV: 2550 SECTION: 8 SW1/4 SW1/4 B&M: BOISE
SURFACE MANIFESTATIONS: FOUND BY DRILLING

ROCK AND STRUCTURE TYPE: MIOCENE BASALT
SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP.
MAX. WELL TEMP 28 C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03
28	0.0	8.30	84.00	73.00	23.00	8.70	14.0	3.1	225

OTHER CHEMICAL DATA TABLE 2. REFERENCE CITED, SAMPLE & TEMP. FROM WELL

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
124.7	128.1	98.6	242.6	153.6

RESERVOIR PROPERTIES

RANGE IN RES TEMP 125 C TO 240 C ASSUMED
BEST EST. AVER. TEMP 135.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.07 TO 0.54 E18 CAL; BEST ESTIMATE 0.16 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:
DEVELOPMENTS: WATER WELL
REFERENCES: YOUNG AND MITCHELL, 1973; WALKER AND SISCO, 1964

TOPO MAPS: CRANE CK RES 1:62,500

SPRING IDENTIFIED: NO

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO PART 1, 1973. IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30. TRAVERTINE DEPOSITING FROM WELL

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: WELL NEAR MIDVALE , ID

170

INPUT RECORD # 134 MIRRORED ON 3/76
NAME: WELL NEAR MIDVALE AIRPORT .ID RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 03/75

LOCATION:

STATE: ID COUNTY: WASHINGTON
LATITUDE: 44 28.20 TOWNSHIP: 13N
LONGITUDE: 116 45.89 RANGE: 04W
ELEV: 2580 SECTION: 13 NE1/4 NW1/4 B&M: BOISE
SURFACE MANIFESTATIONS: FOUND BY DRILLING

ROCK AND STRUCTURE TYPE: MIOCENE BASALT
SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP.

MAX. WELL TEMP 28 C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
28	0.0	8.50	73.00	86.00	0.70	3.50	14.0	3.2	188

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED, SAMPLE FROM FLOWING WELL

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
118.4	120.8	90.5	78.0	50.6

RESERVOIR PROPERTIES

RANGE IN RES TEMP 50 C TO 130 C ASSUMED

BEST EST. AVER. TEMP 125.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.02 TO 0.28 E18 CAL; BEST ESTIMATE 0.15 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WALKER AND SISCO, 1964; YOUNG AND MITCHELL, 1973

TOPO MAPS: MANN CK 1:62,500

SPRING IDENTIFIED: NO

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO PART 1, 1973. IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30. WELL DEPOSITS TRAVERTINE. GEOCHEMICAL TEMPERATURES MAY BE UNRELIABLE.

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: WELL NEAR MIDVALE AIRPORT .ID

INPUT RECORD # 135 MIRRORED ON 3/76
NAME: HOT CREEK SPRINGS ,ID RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 4 NUMBER: 027 DATE: 03/75

LOCATION:

STATE: ID COUNTY: VALLEY
LATITUDE: 44 38.47 TOWNSHIP: 15N
LONGITUDE: 116 2.68 RANGE: 03E
ELEV: 4960 SECTION: 13 ,NW1/4 NW1/4 H&M: BOISE
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM NEAR MIOCENE BASALT & CRETACEOUS GRANITES

SURFACE DISCHARGE TOTAL: 3016.0 L/MIN MEASURED X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: SEVERAL

TEMPERATURE: RANGE OF SPRING TEMP. 34 C OR

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03
34	0.0	9.80	60.00	60.00	0.60	1.30	16.0	16.0	17

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
110.0	111.0	79.7	86.3	61.6

RESERVOIR PROPERTIES

RANGE IN RES TEMP 60 C TO 125 C ASSUMED

BEST EST. AVEP. TEMP 115.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.03 TO 0.26 E18 CAL; BEST ESTIMATE 0.13 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: NEWCOMB, 1970; WARING, 1965; YOUNG AND MITCHELL, 1973

TOPO MAPS: CASCADE 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO, PART 1, 1973. IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30. MIXING MODEL SUGGESTS 195C.

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: HOT CREEK SPRINGS , ID

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INPUT RECORD # 136 MIRRORED ON 3/76
NAME: MOLLY S H.S. ,ID RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 4 NUMBER: 031 DATE: 03/75
LOCATION:

STATE: ID COUNTY: VALLEY
LATITUDE: 44 38.26 TOWNSHIP: 15N
LONGITUDE: 115 41.57 RANGE: 06E
ELEV: 5300 SECTION: 14 ,SW1/4 NE1/4 B&M: HOISE
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: CRETACEOUS GRANITIC ROCKS
SURFACE DISCHARGE TOTAL: 76.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 7

TEMPERATURE: RANGE OF SPRING TEMP. 58 C TO 59 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW

TEMP	L/MIN	PM	SI02	NA	K	CA	S04	CL	HC03
59	0.0	7.70	87.00	70.00	1.50	2.00	17.0	10.0	48

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY		
126.3	130.0	100.7	1/3 113.5	4/3 83.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 80 C TO 140 C ASSUMED
BEST EST. AVER. TEMP 135.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.04 TO 0.30 E18 CAL; BEST ESTIMATE 0.16 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1965; YOUNG AND MITCHELL, 1973

TOPO MAPS: WARM LAKE 1:62,500

SPRING IDENTIFIED:NO

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO PART 1, 1973. IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30. MIXING MODEL SUGGESTS 195C.

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: MOLLY S H.S. , ID

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INPUT RECORD # 137 MIRRORED ON 3/76
NAME: VULCAN H.S. ,ID RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 4 NUMBER: 032 DATE: 03/75

LOCATION:

STATE: ID COUNTY: VALLEY
LATITUDE: 44 34.05 TOWNSHIP: 14N
LONGITUDE: 115 41.53 RANGE: 06E
ELEV: 5600 SECTION: 11 ,SE1/4 NW1/4 B&M: BOISE
SURFACE MANIFESTATIONS: SINTER, HOT SPRING(S),

ROCK AND STRUCTURE TYPE: CRETACEOUS GRANITIC ROCKS
SURFACE DISCHARGE TOTAL: 1890.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 13

TEMPERATURE: RANGE OF SPRING TEMP. 84 C TO 87 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
87	0.0	8.50	120.00	94.00	3.00	1.80	43.0	17.0	120

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
141.5	147.9	120.9	134.9	114.3

RESERVOIR PROPERTIES

RANGE IN RES TEMP 130 C TO 150 C ASSUMED
BEST EST. AVER. TEMP 150.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3.
HEAT CONTENT > 15 C 0.07 TO 0.32 E18 CAL; BEST ESTIMATE 0.18 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1965; YOUNG AND MITCHELL, 1973

TOPO MAPS: WARM LAKE 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO PART 1, 1973. IDAHO DEPT OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: VULCAN H.S. , ID

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INPUT RECORD # 138 MIRRORED ON 3/76
NAME: CABARTON H.S. ,ID RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 03/75
LOCATION:

STATE: ID COUNTY: VALLEY
LATITUDE: 44 25.03 TOWNSHIP: 13N
LONGITUDE: 116 1.68 RANGE: 04E
ELEV: 4718 SECTION: 31 .NE1/4 SW1/4 H&M: BOISE
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: CRETACEOUS GRANITICS
SURFACE DISCHARGE TOTAL: 265.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: NUMEROUS

TEMPERATURE: RANGE OF SPRING TEMP. 71 C OR
MAX. WELL TEMP 56 C AT M DEPTH BOTTOM HOLE TEMP. 71 C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973
SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
71	0.0	7.70	78.00	100.00	1.90	1.70	0.0	0.0	0

OTHER CHEMICAL DATA TABLE 2. REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
121.4	124.2	94.2	114.5	99.1

RESERVOIR PROPERTIES:

RANGE IN RES TEMP 100 C TO 135 C ASSUMED
BEST EST. AVER. TEMP 130.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.05 TO 0.28 E18 CAL; BEST ESTIMATE 0.15 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: NE-COMB, 1970; YOUNG AND MITCHELL, 1973

TOPO MAPS: SMITHS FERRY 1:62,500

SPRING IDENTIFIED: NO

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO, PART 1, 1973. IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30. MIXING MODEL SUGGESTS T=165C

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: CABARTON H.S. , ID

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INPUT RECORD # 139 MIRRORED ON 3/76
NAME: BOILING SPRINGS ,ID RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: NUMBER: DATE: 03/75

LOCATION:
STATE: ID COUNTY: VALLEY
LATITUDE: 44 21.87 TOWNSHIP: 12N
LONGITUDE: 115 51.41 RANGE: 05E
ELEV: 4050 SECTION: 22 ,NW1/4 NW1/4 B&M: HOISE
SURFACE MANIFESTATIONS: SINTER, TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: CRETACEOUS GRANITICS
SURFACE DISCHARGE TOTAL: 624.0 L/MIN MEASURED X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: NUMEROUS

TEMPERATURE: RANGE OF SPRING TEMP. 80 C TO 86 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973
SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
85	0.0	8.80	94.00	71.00	1.70	1.90	12.0	12.0	81

OTHER CHEMICAL DATA TABLE 2. REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
129.8	134.1	105.3	118.5	88.5

RESERVOIR PROPERTIES

RANGE IN RES TEMP 90 C TO 150 C ASSUMED
BEST EST. AVER. TEMP 140.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.04 TO 0.32 E18 CAL; BEST ESTIMATE 0.17 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/MR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: DICKSON AND TUNELL, 1968; WARING, 1965; YOUNG AND MITCHELL, 1973

TOPO MAPS: BOILING SPGS 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO PART 1, 1973. IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30. DEPOSITING MINOR ZEOLITES, CALCITE AND MERCURY MINERALS.

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: BOILING SPRINGS , ID

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INPUT RECORD # 140 MIRRORED ON 3/76
NAME: SPRING NEAR PAYETTE RIVER, ID RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 03/75

LOCATION:

STATE: ID COUNTY: HOISE
LATITUDE: 44 5.14 TOWNSHIP: 09N
LONGITUDE: 116 2.99 RANGE: 03E
ELEV: 3800 SECTION: 25 SW1/4 NE1/4 B&M: HOISE
SURFACE MANIFESTATIONS: SINTER, TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: CRETACEOUS GRANITIC RX
SURFACE DISCHARGE TOTAL: 76.0 L/MIN MEASURED X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 1

TEMPERATURE: RANGE OF SPRING TEMP. 80 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH
CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW
TEMP L/MIN PH SI02 NA K CA SO4 CL HC03
80 0.0 8.10 120.00 130.00 4.80 4.50 79.0 34.0 160

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
141.5	147.9	120.9	139.4	113.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 130 C TO 160 C ASSUMED
BEST EST. AVER. TEMP 150.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.07 TO 0.35 E18 CAL; BEST ESTIMATE 0.18 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MOARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: YOUNG AND MITCHELL, 1973

TOPO MAPS: BANKS 1:62,500

SPRING IDENTIFIED: NO

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO PART 1, 1973, IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30. MIXING MODEL SUGGESTS 200C.

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: SPRING NEAR PAYETTE RIVER, ID

INPUT RECORD # 141 MIRRORED ON 3/76
NAME: SPRING NEAR GRIMES PASS ,ID RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 4 NUMBER: 76 DATE: 03/75
LOCATION:

STATE: ID COUNTY:BOISE
LATITUDE: 44 2.77 TOWNSHIP: 08N
LONGITUDE: 115 51.12 RANGE: 05E
ELEV: 3500 SECTION: 10 ,SE1/4 NW1/4 H&M: BOISE
SURFACE MANIFESTATIONS: HOT SPRING(S),

ROCK AND STRUCTURE TYPE: CRETACEOUS GRANITIC RXS
SURFACE DISCHARGE TOTAL: 265.0 L/MIN MEASURED X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP. 55 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH
CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW
TEMP L/MIN PH SIO2 NA K CA SO4 CL HCO3
55 0.0 8.60 59.00 68.00 1.10 1.90 38.0 5.6 40

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED

SIO2	SIO2	SIO2	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
109.3	110.2	78.8	102.7	73.7

RESERVOIR PROPERTIES

RANGE IN RES TEMP 75 C TO 120 C ASSUMED
BEST EST. AVER. TEMP 115.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.04 TO 0.25 E18 CAL; BEST ESTIMATE 0.14 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: ANDERSON, 1947; WARING, 1965; YOUNG AND MITCHELL, 1973

TOPO MAPS: GARDEN VALLEY, 1:62,500

SPRING IDENTIFIED:NO

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO, PART 1, 1973, IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30; AREA MAY BE LARGER; WARING SPRINGS 74 & 75 NEARBY.

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: SPRING NEAR GRIMES PASS , ID

178

INPUT RECORD # 142 MIRRORED ON 3/76
NAME: KIRKHAM H.S. ID RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARING FIG: 4 NUMBER: 079 DATE: 03/75

LOCATION:

STATE: ID COUNTY: BOISE
LATITUDE: 44 4.32 TOWNSHIP: 09N
LONGITUDE: 115 32.63 RANGE: 08E
ELEV: 4000 SECTION: 32 NE1/4 SW1/4 B&M: BOISE
SURFACE MANIFESTATIONS: SINTER, TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: CRETACEOUS GRANITICS
SURFACE DISCHARGE TOTAL: 945.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: NUMEROUS

TEMPERATURE: RANGE OF SPRING TEMP. 48 C TO 65 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03
65	0.0	7.80	69.00	66.00	1.30	1.90	45.0	3.0	46

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
116.0	117.9	87.3	109.8	78.7

RESERVOIR PROPERTIES

RANGE IN RES TEMP 80 C TO 125 C ASSUMED

BEST EST. AVER. TEMP 120.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.04 TO 0.26 E18 CAL; BEST ESTIMATE 0.14 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1965; YOUNG AND MITCHELL, 1973

TOPO MAPS: CHALLIS 1:250,000

SPRING IDENTIFIED:NO

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO PART 1, 1973, IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL NO. 30

PREPARED BY: PETER OBERLINDACHER, J. RENNEN

NAME: KIRKHAM H.S. ID

179

INPUT RECORD # 143 MIRRORED ON 3/76
NAME: BONNEVILLE H. S. , ID RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 4 NUMBER: 080 DATE: 03/75
LOCATION:

STATE: ID COUNTY:BOISE
LATITUDE: 44 9.46 TOWNSHIP: 10N
LONGITUDE: 115 18.38 RANGE: 10E
ELEV: 5200 SECTION: 31 , 1/4 SW1/4 B&M: BOISE
SURFACE MANIFESTATIONS: SINTER, TRAVERTINE, HOT SPRING(S),

ROCK AND STRUCTURE TYPE: CRETACEOUS GRANITIC ROCKS
SURFACE DISCHARGE TOTAL: 1374.0 L/MIN MEASURED X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 8

TEMPERATURE: RANGE OF SPRING TEMP. 68 C TO 85 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
85	0.0	8.10	100.00	67.00	2.90	2.20	52.0	7.2	21

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
132.7	137.6	109.2	141.9	103.5

RESERVOIR PROPERTIES

RANGE IN RES TEMP 130 C TO 160 C ASSUMED
BEST EST. AVER. TEMP 145.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.07 TO 0.35 E18 CAL; BEST ESTIMATE 0.18 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1965; YOUNG AND MITCHELL, 1973

TOPO MAPS: CHALLIS 1:250,000

SPRING IDENTIFIED:NO

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO PART 1, 1973, IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL: NO. 30. MIXING MODEL SUGGESTS 175C.

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: BONNEVILLE H. S. , ID

180

INPUT RECORD # 144 MIRRORED ON 3/76
NAME: STANLEY H.S. ID RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 4 NUMBER: 094 DATE: 03/75

LOCATION:

STATE: ID COUNTY: CUSTER
LATITUDE: 44 13.45 TOWNSHIP: 10N
LONGITUDE: 114 55.62 RANGE: 13E
ELEV: 6221 SECTION: 3 NE1/4 SW1/4 H&M: BOISE

SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM NEAR CRETACEOUS GRANITIC ROCKS

SURFACE DISCHARGE TOTAL: 416.0 L/MIN MEASURED X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 6

TEMPERATURE: RANGE OF SPRING TEMP. 31 C TO 41 C OR

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
41	0.0	8.80	55.00	60.00	0.50	2.20	31.0	5.0	30

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
106.4	106.8	75.1	77.4	46.6

RESERVOIR PROPERTIES

RANGE IN RES TEMP 50 C TO 150 C ASSUMED

BEST EST. AVER. TEMP 110.0

AREA 2.0 TO 8.0 KM**2; BEST ESTIMATE 4.0 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 2.00 TO 16.00 KM**3; BEST ESTIMATE 6.00 KM**3

HEAT CONTENT > 15 C 0.04 TO 1.30 E18 CAL; BEST ESTIMATE 0.34 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO DARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: CHOATE, 1962; WARING, 1965; YOUNG AND MITCHELL, 1973

TOPO MAPS: STANLEY 1:62,500 ; CHALLIS 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO, PART 1, 1973, IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30. MIXING MODEL SUGGESTS 180C. MAY BE PART OF MORE EXTENSIVE SYSTEM EXTENDING APPROX. 10 KM NE TO SUNBEAM H.S.

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: STANLEY H.S. ID

181

INPUT RECORD # 145 MIRRORED ON 3/76
NAME: SUNBEAM H.S. ID RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 4 NUMBER: 093 DATE: 03/75

LOCATION:

STATE: ID COUNTY: CUSTER
LATITUDE: 44 16.06 TOWNSHIP: 11N
LONGITUDE: 114 44.86 RANGE: 15E
ELEV: 5980 SECTION: 19, 1/4 SW 1/4 B&M: BOISE
SURFACE MANIFESTATIONS: SINTER, TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: CRETACEOUS GRANITIC RXS
SURFACE DISCHARGE TOTAL: 1678.0 L/MIN MEASURED X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: NUMEROUS
TEMPERATURE: RANGE OF SPRING TEMP. 65 C TO 76 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
76	0.0	8.50	91.00	85.00	2.40	1.50	54.0	12.0	119

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
128.3	132.4	103.4	129.4	109.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 125 C TO 150
BEST EST. AVER. TEMP 140.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.07 TO 0.32 E18 CAL; BEST ESTIMATE 0.17 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: YOUNG AND MITCHELL, 1973; CHOATE, 1962; WARING, 1965

TOPO MAPS: SUNBEAM 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO; PART I; 1973; IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30. MAY BE PART OF A LARGER SYSTEM EXTENDING APPROX. 10 KM SW TO STANLEY H.S.

PREPARED BY: PETER OBERLINDACHER, J. RENNERT

NAME: SUNBEAM H.S. ID

182

INPUT RECORD # 146 MIRRORED ON 3/76
NAME: SLATE CREEK H.S. ID RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 4 NUMBER: 099 DATE: 03/75

LOCATION:

STATE: ID COUNTY: CUSTER
LATITUDE: 44 10.13 TOWNSHIP: 10N
LONGITUDE: 114 37.45 RANGE: 16E
ELEV: 7040 SECTION: 30, 1/4 NE1/4 H&M: BOISE

SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: PALEOZOIC ARGILLITE
SURFACE DISCHARGE TOTAL: 700.0 L/MIN MEASURED X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 8

TEMPERATURE: RANGE OF SPRING TEMP. 32 C TO 50 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
50	0.0	8.00	86.00	83.00	4.50	8.10	110.0	7.0	110

OTHER CHEMICAL DATA TABLE 2. REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
125.7	129.3	100.0	145.6	90.6

RESERVOIR PROPERTIES

RANGE IN RES TEMP 90 C TO 140 C ASSUMED
BEST EST. AVER. TEMP 130.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.05 TO 0.30 E18 CAL; BEST ESTIMATE 0.15 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: ROSS, 1937; WARING, 1965; YOUNG AND MITCHELL, 1973

TOPO MAPS: LIVINGSTON CK. 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO PART 1, 1973, IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30. MIXING MODEL SUGGESTS T=210C

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: SLATE CREEK H.S. , ID

183

INPUT RECORD # 147 MIRRORED ON 3/76
NAME: ROYSTONE H.S. (AREA) ,ID RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 4 NUMBER: 066 DATE: 02/75
LOCATION:

STATE: ID COUNTY: GEM
LATITUDE: 43 57.20 TOWNSHIP: 07N
LONGITUDE: 116 18.00 RANGE: 01E
ELEV: 2520 SECTION: 8 ,SE1/4 SW1/4 B&M: BOISE
SURFACE MANIFESTATIONS: HOT SPRING(S),

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM NEAR MIOCENE BASALT

SURFACE DISCHARGE TOTAL: 76.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 5

TEMPERATURE: RANGE OF SPRING TEMP. 45 C TO 55 C OR

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72' SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
55	0.0	7.50	120.00	160.00	7.70	8.70	110.0	62.0	187

OTHER CHEMICAL DATA TABLE 2, REF. CITED

SI02	SI02	SI02	NA_K_CA	OTHER
AUIABATIC	CONDUCTIVE	CHALCEDONY		
141.5	147.9	120.9	1/3 149.7	4/3 117.0

RESERVKIR PROPERTIES

RANGE IN RES TEMP 85 C TO 160 C ASSUMED

BEST EST. AVER. TEMP 150.0

AREA 1.0 TO 3.0 KM**2; BEST ESTIMATE 2.0 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 6.00 KM**3; BEST ESTIMATE 3.00 KM**3

HEAT CONTENT > 15 C 0.04 TO 0.52 E18 CAL; BEST ESTIMATE 0.24 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: NEWCOMB, 1970; WARING, 1965; YOUNG AND MITCHELL, 1973

TOPO MAPS: MONTOUR 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

LOCATIONS SHOWN FIG 4, GEOTHERMAL INV. IN IDAHO, PT. 1, 1973, IDAHO WATER INFO BULL. #30

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: ROYSTONE H.S. (AREA) , ID

INPUT RECORD # 148 MIRRORED ON 3/76
NAME: NE BOISE THERMAL AREA .ID RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: NUMBER: DATE: 03/75

LOCATION:

STATE: ID COUNTY: ADA
LATITUDE: 43 36.14 TOWNSHIP: 03N
LONGITUDE: 116 9.93 RANGE: 02E
ELEV: 2800 SECTION: 12 .SE1/4 SW1/4 8&M: BOISE
SURFACE MANIFESTATIONS: SINTER, TRAVERTINE, HOT SPRING(S),

ROCK AND STRUCTURE TYPE: PLIOCENE AND PLEISTOCENE SEDIMENTS

SURFACE DISCHARGE TOTAL: L/MIN

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP. HOT

MAX. WELL TEMP 75 C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03
75	0.0	7.30	78.00	75.00	1.30	2.00	23.0	9.3	141

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY		
121.4	124.2	94.2	1/3 106.2	4/3 79.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 80 C TO 130 C ASSUMED

BEST EST. AVER. TEMP 125.0

AREA 1.0 TO 8.0 KM**2; BEST ESTIMATE 4.0 KM**2

BASED ON GEOLOGY, SURFACE EXPRESSION

DEPTH TO TOP OF RES. 0.50 KM TO 2.00 KM; BEST ESTIMATE 1.00 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.50 KM; BEST ESTIMATE 2.00 KM.

VOLUME 1.00 TO 20.00 KM**3; BEST ESTIMATE 8.00 KM**3

HEAT CONTENT > 15 C 0.04 TO 1.40 E18 CAL; BEST ESTIMATE 0.53 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS: WATER USED TO HEAT HOMES.

REFERENCES: SAVAGE, 1958; YOUNG AND MITCHELL, 1973

TOPO MAPS: BOISE SOUTH 1:24,000; BOISE 1:62,500

SPRING IDENTIFIED: NO

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO, PART 1, 1973, IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30. LINEAR ZONE OF SPRINGS AND ASSOCIATED THERMAL WELLS ON NE EDGE OF BOISE; USED FOR SPACE HEATING.

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: NE BOISE THERMAL AREA . ID

185

INPUT RECORD # 149 MIRRORED ON 3/76
NAME: NEINMEYER H.S. ID RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARING FIG: 4 NUMBER: 116 DATE: 03/75

LOCATION:

STATE: ID COUNTY: ELMORE
LATITUDE: 43 45.49 TOWNSHIP: 05N
LONGITUDE: 115 34.66 RANGE: 07E
ELEV: 3800 SECTION: 24 . 1/4 NW1/4 B&M: BOISE
SURFACE MANIFESTATIONS: SINTER, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: CRETACEOUS GRANITICS
SURFACE DISCHARGE TOTAL: 1320.0 L/MIN MEASURED X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 13
TEMPERATURE: RANGE OF SPRING TEMP. 68 C TO 76 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973
SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03
76	0.0	0.00	100.00	67.00	1.80	1.10	31.0	3.0	5

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
132.7	137.6	109.2	126.2	102.9

RESERVOIR PROPERTIES

RANGE IN RES TEMP 120 C TO 150 C ASSUMED
BEST EST. AVER. TEMP 140.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.06 TO 0.32 E18 CAL; BEST ESTIMATE 0.17 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1965; YOUNG AND MITCHELL, 1973

TOPO MAPS: HAILEY 1:250,000

SPRING IDENTIFIED: NO

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO PART 1, 1973, IDAHO DEPT OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30. MIXING MODEL SUGGESTS 190C.

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: NEINMEYER H.S. ID

INPUT RECORD # 150 MIRRORED ON 3/76
NAME: DUTCH FRANKS SPRING .ID RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 4 NUMBER: 119 DATE: 03/75

LOCATION:

STATE: ID COUNTY: ELMORE
LATITUDE: 43 47.73 TOWNSHIP: 05N
LONGITUDE: 115 25.53 RANGE: 09E
ELEV: 5500 SECTION: 7 . 1/4 NW1/4 B&M: HOISE

SURFACE MANIFESTATIONS: SINTER, TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: CRETACEOUS GRANITIC RXS
SURFACE DISCHARGE TOTAL: 1134.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: MANY

TEMPERATURE: RANGE OF SPRING TEMP. 53 C TO 65 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973
SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
65	0.0	8.60	72.00	57.00	1.20	2.20	30.0	2.4	17

OTHER CHEMICAL DATA TABLE 2. REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY		
117.8	120.1	89.7	1/3 109.5	4/3 71.5

RESERVOIR PROPERTIES

RANGE IN RES TEMP 70 C TO 130 C ASSUMED
BEST EST. AVER. TEMP 125.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.03 TO 0.28 E18 CAL; BEST ESTIMATE 0.15 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1965; YOUNG AND MITCHELL, 1973

TOPO MAPS: HAILEY 1:250,000

SPRING IDENTIFIED:NO

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO PART 1, 1973, IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: DUTCH FRANKS SPRING . ID

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INPUT RECORD # 151 MIRRORED ON 3/76
NAME: PARADISE H.S. ID RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 03/75

LOCATION:

STATE: ID COUNTY: ELMORE
LATITUDE: 43 33.24 TOWNSHIP: 03N
LONGITUDE: 115 16.29 RANGE: 10E
ELEV: 4377 SECTION: 33 ,SE1/4 NW1/4 B&M: HOISE
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: CRETACEOUS GRANITIC RXS

SURFACE DISCHARGE TOTAL: L/MIN

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: SEVERAL

TEMPERATURE: RANGE OF SPRING TEMP. 56 C OR

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03
56	0.0	9.20	69.00	50.00	1.00	1.50	17.0	2.6	45

OTHER CHEMICAL DATA TABLE 2. REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
116.0	117.9	87.3	108.3	72.4

RESERVOIR PROPERTIES

RANGE IN RES TEMP 75 C TO 125 C ASSUMED

BEST EST. AVER. TEMP 120.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.04 TO 0.26 E18 CAL; BEST ESTIMATE 0.14 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: YOUNG AND MITCHELL, 1973

TOPO MAPS: FEATHERVILLE, 1:24,000

SPRING IDENTIFIED: NO

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATION IN IDAHO, PART 1, 1973, IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: PARADISE H.S. , ID

INP RECORD # 152 MIRRORED ON 3/76
NAME: WORSWICK (WASEWICK) H.S. ID RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARING FIG: 4 NUMBER: 136 DATE: 03/75

LOCATION:

STATE: ID COUNTY: CAMAS
LATITUDE: 43 33.48 TOWNSHIP: 03N
LONGITUDE: 114 47.17 RANGE: 14E
ELEV: 5950 SECTION: 28 NE1/4 SE1/4 B&M: BOISE
SURFACE MANIFESTATIONS: SINTER, TRAVERTINE, HOT SPRING(S),

ROCK AND STRUCTURE TYPE: CRETACEOUS GRANITICS
SURFACE DISCHARGE TOTAL: 1762.0 L/MIN MEASURED X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: NUMEROUS(50)

TEMPERATURE: RANGE OF SPRING TEMP. 50 C TO 81 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
81	0.0	7.30	96.00	69.00	1.90	1.80	35.0	5.0	51

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
130.8	135.3	106.6	124.2	93.3

RESERVOIR PROPERTIES

RANGE IN RES TEMP 95 C TO 145 C ASSUMED
BEST EST. AVER. TEMP 140.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.05 TO 0.31 E18 CAL; BEST ESTIMATE 0.17 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MOARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: UMPLEBY, 1913; WARING, 1965; YOUNG AND MITCHELL, 1973

TOPO MAPS: SYDNEY BUTTE, 1:24,000; HAILEY 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO PART 1, 1973, IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: WORSWICK (WASEWICK) H.S. ID

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INPUT RECORD # 153 MIRRORED ON 3/76
NAME: GUYER HOT SPRINGS, ID RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARING FIG: 4 NUMBER: 142 DATE: 03/75

LOCATION:

STATE: ID COUNTY: BLAINE
LATITUDE: 43 40.51 TOWNSHIP: 04N
LONGITUDE: 114 24.60 RANGE: 17E
ELEV: 5910 SECTION: 15 NE1/4 NE1/4 B&M: BOISE
SURFACE MANIFESTATIONS: SINTER, TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: PALEOZOIC LIMESTONE
SURFACE DISCHARGE TOTAL: 3780.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: SEVERAL

TEMPERATURE: RANGE OF SPRING TEMP. 55 C TO 70 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW

TEMP	L/MIN	PM	SI02	NA	K	CA	SO4	CL	HC03
71	0.0	8.00	86.00	84.00	2.10	2.90	72.0	11.0	51

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
125.7	129.3	100.0	119.6	88.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 90 C TO 140 C ASSUMED
BEST EST. AVER. TEMP 135.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.05 TO 0.30 E18 CAL; BEST ESTIMATE 0.16 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: UMPLEBY AND OTHERS, 1930; WARING, 1965; YOUNG AND MITCHELL, 1973

TOPO MAPS: GRIFFIN BUTTE 1:24,000

SPRING IDENTIFIED: YES

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO, PART 1, 1973, IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30

PREPARED BY: PETER OBERLINDAGHER, J. RENNER

NAME: GUYER HOT SPRINGS, ID

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INPUT RECORD # 154 MIRRORED ON 3/76
NAME: CLARENDON HOT SPRINGS .ID RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 4 NUMBER: 144 DATE: 03/75

LOCATION:

STATE: ID COUNTY:BLAINE
LATITUDE: 43 33.64 TOWNSHIP: 03N
LONGITUDE: 114 24.89 RANGE: 17E
ELEV: 5740 SECTION: 27 ,SW1/4 SE1/4 B&M: BOISE
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: PALEOZOIC QUARTZITE
SURFACE DISCHARGE TOTAL: 378.0 L/MIN MEASURED X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: NUMEROUS

TEMPERATURE: RANGE OF SPRING TEMP. 42 C TO 47 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
47	0.0	8.20	80.00	81.00	1.70	2.20	68.0	11.0	29

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
122.5	125.5	95.7	114.0	86.7

RESERVOIR PROPERTIES

RANGE IN RES TEMP 80 C TO 135 C ASSUMED
BEST EST. AVER. TEMP 130.0
AREA 1.0 TO 2.0 KM**2;BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.04 TO 0.29 E18 CAL; BEST ESTIMATE 0.16 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: UMPLEBY AND OTHERS, 1930; WARING, 1965; YOUNG AND MITCHELL, 1973

TOPO MAPS: MAHONEY BUTTE, 1:24,000

SPRING IDENTIFIED: YES

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO, PART 1, 1973, IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30. MIXING MODEL SUGGESTS 215C.

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: CLARENDON HOT SPRINGS . ID

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INPUT RECORD # 155 MIRRORED ON 3/76
NAME: HAILEY HOT SPRINGS ,ID RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 4 NUMBER: 145 DATE: 03/75

LOCATION:

STATE: ID COUNTY:BLAINE
LATITUDE: 43 30.34 TOWNSHIP: 02N
LONGITUDE: 114 22.02 RANGE: 18E
ELEV: 5455 SECTION: 18 ,NW1/4 SE1/4 B&M: BOISE
SURFACE MANIFESTATIONS: SINTER,HOT SPRING(S).

ROCK AND STRUCTURE TYPE: PALEOZOIC LS.
SURFACE DISCHARGE TOTAL: 265.0 L/MIN MEASURED X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: SEVERAL

TEMPERATURE: RANGE OF SPRING TEMP. 59 C TO 63 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
59	0.0	8.70	85.00	68.00	1.50	2.00	51.0	10.0	88

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
125.2	128.7	99.3	114.3	82.6

RESERVOIR PROPERTIES

RANGE IN RES TEMP 80 C TO 140 C ASSUMED

BEST EST. AVER. TEMP 135.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.04 TO 0.30 E18 CAL; BEST ESTIMATE 0.16 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: UMPLEBY AND OTHERS, 1930; WARING, 1965; YOUNG AND MITCHELL, 1973

TOPO MAPS: HAILEY, 1:24,000

SPRING IDENTIFIED: YES

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO PART 1, 1973. IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30. MIXING MODEL SUGGESTS 190C

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: HAILEY HOT SPRINGS , ID

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INPUT RECORD # 156 MIRRORED ON 3/76
NAME: WELL NEAR BROCKIE AIRPORT ,ID RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 03/75

LOCATION:

STATE: ID COUNTY: BUTTE
LATITUDE: 43 32.43 TOWNSHIP: 03N
LONGITUDE: 118 30.12 RANGE: 25E
ELEV: 5730 SECTION: 32 ,SE1/4 SW1/4 H&M: BOISE

SURFACE MANIFESTATIONS: FOUND BY DRILLING

ROCK AND STRUCTURE TYPE: PLEISTOCENE BASALT
SURFACE DISCHARGE TOTAL: 45.0 L/MIN MEASURED X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP. 41 C OR
MAX. WELL TEMP 41 C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
41	0.0	6.30	55.00	72.00	21.00	74.00	170.0	21.0	322

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED. SAMPLE FROM WELL

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
106.4	106.8	75.1	213.6	91.2

RESERVOIR PROPERTIES

RANGE IN RES TEMP 90 C TO 115 C ASSUMED
BEST EST. AVER. TEMP 110.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.05 TO 0.24 E18 CAL; BEST ESTIMATE 0.13 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY:
AVERAGE WELL FLOW TO KG/MH; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: YOUNG AND MITCHELL, 1973

TOPO MAPS: GROUSE 1:24,000; IDAHO FALLS 1:250,000

SPRING IDENTIFIED:NO

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO PART 1, 1973, IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: WELL NEAR BROCKIE AIRPORT , ID

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INPUT RECORD # 157 MIRRORED ON 3/76
NAME: ELK CREEK H.S. .ID RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 03/75
LOCATION:

STATE: ID COUNTY: CAMAS
LATITUDE: 43 25.38 TOWNSHIP: 01N
LONGITUDE: 115 37.64 RANGE: 15E
ELEV: 5670 SECTION: 14 .SE1/4 NE1/4 B&M: HOISE
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S),

ROCK AND STRUCTURE TYPE: CRETACEOUS GRANITIC ROCKS NEAR CONTACT WITH OLIGOCENE VOLCANICS

SURFACE DISCHARGE TOTAL: 57.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 5

TEMPERATURE: RANGE OF SPRING TEMP. 43 C TO 54 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
54	0.0	8.20	63.00	87.00	1.40	2.30	48.0	25.0	82

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
112.1	113.4	82.3	104.4	80.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 80 C TO 130 C ASSUMED

BEST EST. AVER. TEMP 120.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.04 TO 0.55 E18 CAL; BEST ESTIMATE 0.14 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WALTON, 1962; YOUNG AND MITCHELL, 1973

TOPO MAPS: BLAINE 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO, PART 1, 1973, IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30. MAY BE PART OF A LARGER SYSTEM UNDERLYING CAMAS PRAIRIE.

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: ELK CREEK H.S. , ID

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INPUT RECORD # 158 MIRRORED ON 3/76
NAME: WELL NEAR PUNKIN CORNER ,ID RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 03/75

LOCATION:
STATE: ID COUNTY: CAMAS
LATITUDE: 43 18.13 TOWNSHIP: 01S
LONGITUDE: 114 54.40 RANGE: 13E
ELEV: 5055 SECTION: 27 ,SW1/4 SW1/4 B&M: BOISE
SURFACE MANIFESTATIONS: FOUND BY DRILLING

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM
SURFACE DISCHARGE TOTAL: 15.0 L/MIN MEASURED X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP. 35 C TO
MAX. WELL TEMP 35 C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW
TEMP L/MIN PH SI02 NA K CA SO4 CL HCO3
35 0.0 7.40 76.00 92.00 1.30 3.20 6.4 12.0 216

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
120.2	122.9	92.7	98.2	71.2

RESERVOIR PROPERTIES

RANGE IN RES TEMP 0 C TO 70 MEASURED
BEST EST. AVER. TEMP 0.0
AREA 125.0 TO 1.0 KM**2; BEST ESTIMATE 2.0 KM**2
BASED ON 1.5
DEPTH TO TOP OF RES. 0.00 KM TO 1.00 KM; BEST ESTIMATE 2.00 KM.
DEPTH TO BOTTOM OF RES. 1.50 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 3.00 TO 1.00 KM; BEST ESTIMATE 2.00 KM.
VOLUME 1.50 TO 1.00 KM**3; BEST ESTIMATE 4.00 KM**3
HEAT CONTENT > 15 C 0.00 TO 0.03 E18 CAL; BEST ESTIMATE 0.28 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WALTON, 1962; YOUNG AND MITCHELL, 1973

TOPO MAPS: FAIRFIELD 1:62,500

SPRING IDENTIFIED:NO

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO PART 1, 1973. IDAHO DEPT OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30. DEPOSITING SILICA. MAY BE PART OF A LARGER SYSTEM UNDERLYING CAMAS PRAIRIE.

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: WELL NEAR PUNKIN CORNER • ID

195

INPUT RECORD # 159 MIRRORED ON 3/76
NAME: BARRONS H.S. ID RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 03/75
LOCATION:

STATE: ID COUNTY: CAMAS
LATITUDE: 43 18.13 TOWNSHIP: 01S
LONGITUDE: 114 54.40 RANGE: 13E
ELEV: 5055 SECTION: 34 SW1/4 NW1/4 B&M: BOISE
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM NEAR PLEISTOCENE BASALT & CRETACEOUS GRANITIC ROCKS

SURFACE DISCHARGE TOTAL: 117.0 L/MIN MEASURED X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: NUMEROUS

TEMPERATURE: RANGE OF SPRING TEMP. 62 C TO 71 C OR

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
70	0.0	7.30	77.00	99.00	2.50	3.60	13.0	15.0	226

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
120.8	123.5	93.5	120.8	91.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 90 C TO 135 C ASSUMED

BEST EST. AVER. TEMP 130.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.04 TO 0.29 E18 CAL; BEST ESTIMATE 0.16 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WALTON, 1962; YOUNG AND MITCHELL, 1973

TOPO MAPS: FAIRFIELD 1:62,500

SPRING IDENTIFIED: NO

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO, PART 1, 1973, IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30. MAY BE PART OF A LARGER SYSTEM UNDERLYING CAMAS PRAIRIE.

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: BARRONS H.S. ID

196

INPUT RECORD # 160 MIRRORED ON 3/76
NAME: WELL NEAR MAGIC RESERVOIR .ID RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 03/75

LOCATION:
STATE: ID COUNTY:BLAINE
LATITUDE: 43 19.73 TOWNSHIP: 01S
LONGITUDE: 114 23.18 RANGE: 17E
ELEV: 4805 SECTION: 23 NE1/4 NE1/4 B&M: NOISE
SURFACE MANIFESTATIONS: FOUND BY DRILLING

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM
SURFACE DISCHARGE TOTAL: 57.0 L/MIN MEASURED X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 1

TEMPERATURE: RANGE OF SPRING TEMP.

MAX. WELL TEMP 71 C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03
0	0.0	6.40	100.00	330.00	19.00	22.00	60.0	83.0	766

OTHER CHEMICAL DATA TABLE 2. REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
132.7	137.6	109.2	162.6	139.4

RESERVOIR PROPERTIES

RANGE IN RES TEMP 120 C TO 276 C ASSUMED

BEST EST. AVER. TEMP 140.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.06 TO 0.62 E18 CAL; BEST ESTIMATE 0.17 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: SMITH, 1959; YOUNG AND MITCHELL, 1973

TOPO MAPS: BELLEVUE 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO, PART 1, 1973, IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30. DEPOSITING TRAVERTINE. MIXING MODEL SUGGESTS 275C.

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: WELL NEAR MAGIC RESERVOIR .ID

197

INPUT RECORD # 161 MIRRORED ON 3/76
NAME: WELL NEAR BENNETT CREEK ,ID RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 03/75
LOCATION:

STATE: ID COUNTY:ELMORE
LATITUDE: 43 6.89 TOWNSHIP: 03S
LONGITUDE: 115 27.94 RANGE: 08E
ELEV: 3400 SECTION: 36 .SE1/4 SW1/4 B&M: BOISE
SURFACE MANIFESTATIONS: FOUND BY DRILLING

ROCK AND STRUCTURE TYPE: PLIOCENE AND PLEISTOCENE SEDS. (?) POSSIBLY DIATOMACEOUS

SURFACE DISCHARGE TOTAL: 2646.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP.

MAX. WELL TEMP 68 C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
68	0.0	8.50	86.00	87.00	0.80	1.50	14.0	4.5	74

OTHER CHEMICAL DATA TABLE 2. REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
125.7	129.3	100.0	86.9	71.2

RESERVOIR PROPERTIES

RANGE IN RES TEMP 70 C TO 140 C ASSUMED

BEST EST. AVER. TEMP 135.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.03 TO 0.30 E18 CAL; BEST ESTIMATE 0.16 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: DION AND GRIFFITHS, 1967; MALDE AND POWERS, 1972; YOUNG AND MITCHELL, 1973

TOPO MAPS: BENNETH MTN. 1:62,500

SPRING IDENTIFIED:NO

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO PART 1, 1973, IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL; NO. 30; MAY BE PART OF A LARGER SYSTEM INCLUDING LATTY H.S. RADIO TOWERS AND RYEGRASS CREEK. TEMPERATURE MAY BE TOO HIGH BECAUSE OF EQUILIBRIUM WITH DIATOMITE.

PREPARED BY:PETER OBERLINDACHER, J. RENNER

NAME: WELL NEAR BENNETT CREEK , ID

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INPUT RECORD # 162 MIRRORED ON 3/76
NAME: LATTY H.S. ID RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 03/75

LOCATION:
STATE: ID COUNTY: ELMORE
LATITUDE: 43 6.97 TOWNSHIP: 03S
LONGITUDE: 115 18.33 RANGE: 10E
ELEV: 3900 SECTION: 31 SE1/4 SE1/4 H&M. BOISE
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: PLEISTOCENE BASALT; VITRIC TUFFS
SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 6.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 1

TEMPERATURE: RANGE OF SPRING TEMP. 55 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

TEMP	FLOW	PH	SI02	NA	K	CA	SO4	CL	HC03
55	0.0	8.40	100.00	54.00	1.70	0.40	10.0	3.0	90

OTHER CHEMICAL DATA TABLE 2. REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
132.7	137.6	109.2	137.2	124.4

RESERVOIR PROPERTIES

RANGE IN RES TEMP 130 C TO 150 C ASSUMED
BEST EST. AVER. TEMP 140.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.07 TO 0.32 E18 CAL; BEST ESTIMATE 0.17 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MALDE AND OTHERS, 1963; YOUNG AND MITCHELL, 1973

TOPO MAPS: BENNETT MTN. 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO, PART 1, 1973, IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30. MAY BE PART OF AN EXTENSIVE SYSTEM INCLUDING BENNETT CREEK, RADIO TOWERS AND RYEGHASS CREEK. VITRIC TUFFS AND PERHAPS DIATOMITE MAY MAKE GEOTHERMOMETRY QUESTIONABLE.

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: LATTY H.S. ID

INPUT RECORD # 163 MIRRORED ON 3/76
NAME: WELL NEAR RYEGRASS CREEK ,ID RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 03/75

LOCATION:

STATE: ID COUNTY:ELMORE
LATITUDE: 43 5.75 TOWNSHIP: 04S
LONGITUDE: 115 24.58 RANGE: 09E
ELEV: 3450 SECTION: 8 ,NW1/4 NE1/4 B&M: BOISE
SURFACE MANIFESTATIONS: FOUND BY DRILLING

ROCK AND STRUCTURE TYPE: PLIOGENE & PLEISTOCENE BASALT AND SEDIMENTS, POSSIBLY DIATOMACEOUS

SURFACE DISCHARGE TOTAL: L/MIN

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE Ex: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 4

TEMPERATURE: RANGE OF SPRING TEMP.

MAX. WELL TEMP 62 C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03
62	0.0	7.80	85.00	82.00	0.80	0.90	14.0	3.2	81

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
125.2	128.7	99.3	91.2	81.5

RESERVOIR PROPERTIES

RANGE IN RES TEMP 80 C TO 140 C ASSUMED

BEST EST. AVER. TEMP 135.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.04 TO 0.30 E18 CAL; BEST ESTIMATE 0.16 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MALDE AND POWERS, 1972; RALSTON AND CHAPMAN, 1968; YOUNG AND MITCHELL, 1973

TOPO MAPS: BENNETT MTN. 1:62,500

SPRING IDENTIFIED:NO

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO, PART 1, 1973, IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30. DEPOSITING TRAVERTINE. MAY BE PART OF AN EXTENSIVE SYSTEM INCLUDING BENNETT CREEK, LATTY, AND RADIO TOWERS. GEOCHEMISTRY MAY BE QUESTIONABLE DUE TO DIATOMACEOUS EARTH.

PREFARED BY:PETER OBERLINDACHER, J. RENNER

NAME: WELL NEAR RYEGRASS CREEK , ID

200

INPUT RECORD # 164 MIRRORED ON 3/76
NAME: WELL NEAR RADIO TOWERS .ID RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 03/75

LOCATION:

STATE: ID COUNTY: ELMORE
LATITUDE: 43 2.24 TOWNSHIP: 045
LONGITUDE: 115 27.45 RANGE: 08E
ELEV: 3175 SECTION: 36 .NW1/4 NW1/4 S6M: BOISE
SURFACE MANIFESTATIONS: FOUND BY DRILLING

ROCK AND STRUCTURE TYPE: PLIOCENE AND PLEISTOCENE SEDS POSSIBLY DIATOMACEOUS

SURFACE DISCHARGE TOTAL: 30.0 L/MIN MEASURED X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP.

MAX. WELL TEMP 38 C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03
38	30.2	7.80	86.00	160.00	3.70	3.20	5.4	10.0	447

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
125.7	129.3	100.0	124.6	114.4

RESERVOIR PROPERTIES

RANGE IN RES TEMP 120 C TO 140 C ASSUMED

BEST EST. AVER. TEMP 130.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.06 TO 0.30 E18 CAL; BEST ESTIMATE 0.16 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDAFCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MALDE AND POWERS, 1963; RALSTON AND CHAPMAN, 1968; YOUNG AND MITCHELL, 1973

TOPO MAPS: BENNETT MTN. 1:62,500

SPRING IDENTIFIED:NO

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO PART 1, 1973, IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30. GEOTHERMOMETRY MAY BE QUESTIONABLE. MAY BE MORE EXTENSIVE AREA INCLUDING BENNETT CREEK, LATTY, AND RYEGRASS CREEK.

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: WELL NEAR RADIO TOWERS .ID

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INPUT RECORD # 165 MIRRORED ON 3/76
NAME: WHITE ARROW H.S. ,ID RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 4 NUMBER: 170 DATE: 03/75
LOCATION:

STATE: ID COUNTY: GOODING
LATITUDE: 43 2.93 TOWNSHIP: 04S
LONGITUDE: 114 57.24 RANGE: 13E
ELEV: 3320 SECTION: 30 ,SE1/4 NE1/4 B&M: BOISE
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM NEAR PLIOCENE BASALT
SURFACE DISCHARGE TOTAL: 3122.0 L/MIN MEASURED X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 4

TEMPERATURE: RANGE OF SPRING TEMP. 65 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH
CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03
65	0.0	7.50	97.00	91.00	1.60	1.20	15.0	66.0	141

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIBATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
131.3	135.9	107.3	112.5	100.2

RESERVOIR PROPERTIES

RANGE IN RES TEMP 115 C TO 150 C ASSUMED
BEST EST. AVER. TEMP 140.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.06 TO 0.32 E18 CAL; BEST ESTIMATE 0.17 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MALDE AND OTHERS, 1963; WARING, 1965; YOUNG AND MITCHELL, 1973

TOPO MAPS: DAVIS MTN. 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO. PART 1, 1973. IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION; BULL. NO. 30. MIXING MODEL SUGGESTS 200C.

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: WHITE ARROW H.S. , ID

202

INPUT RECORD # 166 MIRRORED ON 3/76
NAME: WELL NEAR CHALK MINE .10 RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WAKING FIG: NUMBER: DATE: 03/75
LOCATION:

STATE: ID COUNTY: GOODING
LATITUDE: 43 2.93 TOWNSHIP: 04S
LONGITUDE: 114 55.00 RANGE: 13E
ELEV: 3350 SECTION: 28 .SW1/4 NE1/4 B&M: BOISE
SURFACE MANIFESTATIONS: FOUND BY DRILLING

ROCK AND STRUCTURE TYPE:
SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP.
MAX. WELL TEMP 47 C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973
SPRING FLOW
TEMP L/MIN PH SIO2 NA K CA SO4 CL HCO3
47 0.0 7.00 92.00 100.00 5.90 9.80 19.0 8.2 278

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED
SIO2 SIO2 SIO2 NA_K_CA OTHER
ADIABATIC CONDUCTIVE CHALCEDONY 1/3 4/3
128.8 133.0 104.0 150.9 97.9

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 150 C ASSUMED
BEST EST. AVER. TEMP 140.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.05 TO 0.32 E18 CAL; BEST ESTIMATE 0.17 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: STEARNS AND OTHERS, 1938; YOUNG AND MITCHELL, 1973

TOPO MAPS: DAVIS MTN. 1:62,500

SPRING IDENTIFIED: NO

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO, PART 1, 1973, IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30. WELL DEPOSITS TRAVERTINE.

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: WELL NEAR CHALK MINE .10

203

INPUT RECORD # 167 MIRRORED ON 3/76
NAME: WELL NEAR CLOVER CREEK , ID RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 03/75

LOCATION:

STATE: ID COUNTY: GOODING
LATITUDE: 43 1.36 TOWNSHIP: 05S
LONGITUDE: 115 0.55 RANGE: 12E
ELEV: 3119 SECTION: 3 .NE1/4 NE1/4 B&M: BOISE

SURFACE MANIFESTATIONS: FOUND BY DRILLING

ROCK AND STRUCTURE TYPE: PLIOCENE SEDIMENTS AND BASALT

SURFACE DISCHARGE TOTAL: L/MIN

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP.

MAX. WELL TEMP 43 C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03
43	0.0	8.60	62.00	90.00	0.80	1.60	19.0	8.4	83

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
111.4	112.6	81.4	85.7	70.2

RESERVOIR PROPERTIES

RANGE IN RES TEMP 70 C TO 130 C ASSUMED

BEST EST. AVER. TEMP 120.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.03 TO 0.28 E18 CAL; BEST ESTIMATE 0.14 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MALDE AND OTHERS, 1963; YOUNG AND MITCHELL, 1973

TOPO MAPS: KING MTN. 1:62,500

SPRING IDENTIFIED:NO

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO, PART 1, 1973, IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30. WELL DEPOSITS TRAVERTINE.

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: WELL NEAR CLOVER CREEK , ID

204

INPUT RECORD # 168 MIRRORED ON 3/76
NAME: WELL NEAR GRAVEL PITS ,ID RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 03/75

LOCATION:

STATE: ID COUNTY:ELMORE
LATITUDE: 42 54.27 TOWNSHIP: 05S
LONGITUDE: 115 29.47 RANGE: 08E
ELEV: 2500 SECTION: 34 .SE1/4 1/4 B&M: BOISE
SURFACE MANIFESTATIONS: FOUND BY DRILLING

ROCK AND STRUCTURE TYPE: PLIOCENE & PLEISTOCENE SEDIMENTS(?) POSSIBLY DIATOMACEOUS

SURFACE DISCHARGE TOTAL: 7.6 L/MIN MEASURED X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP.

MAX. WELL TEMP 34 C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
34	0.0	7.70	58.00	320.00	11.00	9.10	6.5	59.0	797

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
109.6	109.4	77.9	144.4	140.8

RESERVOIR PROPERTIES

RANGE IN RES TEMP 110 C TO 180 C ASSUMED

BEST EST. AVER. TEMP 145.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.06 TO 0.39 E18 CAL; BEST ESTIMATE 0.18 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MALDE AND POWERS, 1972; RALSTON AND CHAPMAN, 1968; YOUNG AND MITCHELL, 1973

TOPO MAPS: HAMMETT 1:24,000; GLENN'S FERRY 1:62,500

SPRING IDENTIFIED:NO

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO PART 1, 1973. IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30. WELL DEPOSITS TRAVERTINE. DIATOMACEOUS EARTH POSSIBLE AT DEPTH. GEOTHERMOMETRY MAY BE INACCURATE.

PREP.:RED BY:PETER OBERLINDACHER, J. RENNER

NAME: WELL NEAR GRAVEL PITS , ID

205

INPUT RECORD # 169 MIRRORED ON 3/76
NAME: BRUNEAU-GRANDVIEW ,ID RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 4 NUMBER: 160-169 DATE: 04/75

LOCATION:

STATE: ID COUNTY:OWYHEE
LATITUDE: 42 56.00 TOWNSHIP: 06S
LONGITUDE: 115 56.00 RANGE: 04E
ELEV: 2650 SECTION: , 1/4 1/4 B&M: BOISE
SURFACE MANIFESTATIONS: HOT SPRING(S),

ROCK AND STRUCTURE TYPE: SILICIC VOLCANICS, PLEISTOCENE ALLUVIUM, PLIOCENE BANBURY BASALT
SURFACE DISCHARGE TOTAL: 10000.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP. 84 C OR
MAX. WELL TEMP 36 C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND WHITEHEAD, 1974A

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03
36	0.0	8.90	100.00	25.00	6.40	6.80	29.0	11.0	108

OTHER CHEMICAL DATA A SOMEWHAT REPRESENTATIVE WELL

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
132.7	137.6	109.2	208.3	93.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 160 C ASSUMED
BEST EST. AVER. TEMP 145.0
AREA 700.0 TO 2500.0 KM**2; BEST ESTIMATE 2250.0 KM**2
BASED ON GRAV, AEROMAG, WELLS, AMT, DC RES, SEISMIC REF, GEOLOGY
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 700.00 TO 5000.00 KM**3; BEST ESTIMATE 3375.00 KM**3
HEAT CONTENT > 15 C 36.00 TO 435.00 E18 CAL; BEST ESTIMATE 263.00 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS: GRAV, MAG, DC RESIST., AMT.
DEVELOPMENTS: NUMEROUS WARM WATER WELLS
REFERENCES: WARING, 1965; YOUNG AND WHITEHEAD, 1974A

TOPO MAPS: HOT SPRING, JACKASS BUTTE, LITTLE VALLEY, SUGAR VALLEY, BRUNEAU, GRAND VIEW 1:24,000; BRUNEAU, GRAND VIEW, BIGFOOT BUTTE, INDIAN COVE 1:62,500

SPRING IDENTIFIED: NO

COMMENTS:

SI02 SEEMS UNIFORM IN LARGE NUMBER OF WELLS AND SPRINGS. IT APPEARS MORE SUITABLE THAN THE NA-K-1/3CA TEMPERATURES WHICH ARE ERATIC. AREA 30X75 KM**2. MIXING MODELS UP TO 275C.

PREPARED BY: PETER OBERLINDACHER, J. RENNER, D. WILLIAMS

NAME: BRUNEAU-GRANDVIEW , ID

206

INPUT RECORD # 170 MIRRORED ON 3/76
NAME: BANBURY AREA ,ID RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 4 NUMBER: 174-175 DATE: 02/75

LOCATION:

STATE: ID COUNTY: TWIN FALLS
LATITUDE: 42 41.40 TOWNSHIP: 08S
LONGITUDE: 114 50.00 RANGE: 14E
ELEV: 2920 SECTION: 31-33 . 1/4 1/4 B&M: HOISE
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S),

ROCK AND STRUCTURE TYPE: PLEISTOCENE & PLIOCENE SEDIMENTS ON PLIOCENE & OLDER BASALT & SILICIC VOLCANICS

SURFACE DISCHARGE TOTAL: 1550.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP.

MAX. WELL TEMP 59 C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
59	225.0	8.50	97.00	100.00	1.50	1.10	26.0	27.0	88

OTHER CHEMICAL DATA ANALYSIS FROM WELL IN SEC. 33

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
131.3	135.9	107.3	108.1	101.1

RESERVOIR PROPERTIES

RANGE IN RES TEMP 105 C TO 145 C ASSUMED

BEST EST. AVER. TEMP 140.0

AREA 2.0 TO 10.0 KM**2; BEST ESTIMATE 8.0 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 2.00 TO 20.00 KM**3; BEST ESTIMATE 12.00 KM**3

HEAT CONTENT > 15 C 0.11 TO 1.60 E18 CAL; BEST ESTIMATE 0.90 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MALDE AND POWERS, 1972; STEARNS AND OTHERS, 1938; WARING, 1965; YOUNG AND MITCHELL, 1973

TOPO MAPS: THOUSAND SPRINGS, 1:24,000

SPRING IDENTIFIED: YES

COMMENTS:

COMBINES BANBURY, MIRACLE (OR RINGS?), AND AN UNNAMED SPRING IN SEC. 30 T. 8S., R. 14E. LOCATIONS: FIG. 4, IDA
NO WATER INFO BULL. 30. MIXING MODEL SUGGESTS 215C.

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: BANBURY AREA , ID

207

INPUT RECORD # 171 MIRRORED ON 3/76
NAME: WELL NEAR CEDAR HILL ,ID RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 05/75

LOCATION:
STATE: ID COUNTY:TWIN FALLS
LATITUDE: 42 24.92 TOWNSHIP: 12S
LONGITUDE: 114 18.09 RANGE: 18E
ELEV: 4200 SECTION: 1 ,NW1/4 NW1/4 B&M: NOISE
SURFACE MANIFESTATIONS: FOUND BY DRILLING

ROCK AND STRUCTURE TYPE: PLIOCENE SILICIC VOLC. ROCKS
SURFACE DISCHARGE TOTAL: 2050.0 L/MIN MEASURED X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP.
MAX. WELL TEMP 38 C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH
CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW
TEMP L/MIN PH SI02 NA K CA S04 CL HC03
38 0.0 7.60 67.00 16.00 6.00 18.00 9.3 8.0 93

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED. SAMPLE FROM FLOWING WELL

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
114.7	116.4	85.7	212.7	64.9

RESERVOIR PROPERTIES

RANGE IN RES TEMP 65 C TO 125 C ASSUMED
BEST EST. AVER. TEMP 120.0
AREA 1.0 TO 10.0 KM**2; BEST ESTIMATE 6.0 KM**2
BASED ON GEOLOGY, SURFACE EXPRESSION
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 20.00 KM**3; BEST ESTIMATE 4.00 KM**3
HEAT CONTENT > 15 C 0.03 TO 1.30 E18 CAL; BEST ESTIMATE 0.60 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: CROSTHWAITE, 1969; YOUNG AND MITCHELL, 1973

TOPO MAPS: STRICKER BUTTE 1:62,500

SPRING IDENTIFIED:NO

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO, PART 1, 1973, IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30 COMBINED WITH SPRING IN 11S, 19E, SEC.33. COMBINED WITH SPRING IN 11S, 19E SEC. 33.

PREPARED BY:PETER OBERLINDACHER, J. RENNER

NAME: WELL NEAR CEDAR HILL , ID

208

INPUT RECORD # 172 MIRRORED ON 3/76
NAME: WELL NEAR BRIDGER SPRING .ID RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 03/75
LOCATION:

STATE: ID COUNTY: CASSIA
LATITUDE: 42 28.69 TOWNSHIP: 11S
LONGITUDE: 113 37.46 RANGE: 25E
ELEV: 4290 SECTION: 11 SW1/4 SW1/4 B&M: BOISE
SURFACE MANIFESTATIONS: FOUND BY DRILLING

ROCK AND STRUCTURE TYPE: PRECAMBRIAN QUARTZITE
SURFACE DISCHARGE TOTAL: 7900.0 L/MIN MEASURED X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP.

MAX. WELL TEMP 60 C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
60	0.0	7.70	60.00	110.00	3.90	8.20	59.0	55.0	125

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED SAMPLE FROM WELL

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
110.0	111.0	79.7	130.7	88.6

RESERVOIR PROPERTIES

RANGE IN RES TEMP 90 C TO 120

BEST EST. AVER. TEMP 115.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.05 TO 0.25 E18 CAL; BEST ESTIMATE 0.14 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: CROSTHWAITE, 1957; YOUNG AND MITCHELL, 1973

TOPO MAPS: ALBION 1:24,000

SPRING IDENTIFIED: NO

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO, PART 1, 1973, IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30. MIXING MODEL SUGGESTS 150C.

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: WELL NEAR BRIDGER SPRING .ID

209

INPUT RECORD # 173 MIRRORED ON 3/76
NAME: OAKLEY WARM SPRING, ID RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARING FIG: 4 NUMBER: 182 DATE: 03/75

LOCATION:
STATE: ID COUNTY: CASSIA
LATITUDE: 42 10.42 TOWNSHIP: 14S
LONGITUDE: 113 51.65 RANGE: 22E
ELEV: 3227 SECTION: 27 SW1/4 SE1/4 M&M: HOISE
SURFACE MANIFESTATIONS: HOT SPRING(S),

ROCK AND STRUCTURE TYPE: PRECAMBRIAN QUARTZITE
SURFACE DISCHARGE TOTAL: 38.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 1
TEMPERATURE: RANGE OF SPRING TEMP. 47 C OR
MAX. WELL TEMP C AT M DEPTH
CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973
BOTTOM HOLE TEMP. C AT M DEPTH

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
47	0.0	9.60	70.00	87.00	2.20	2.70	22.0	53.0	43

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED
ADIAHATIC CONDUCTIVE CHALCEDONY NA_K_CA OTHER
116.6 118.6 88.1 1/3 4/3
121.0 91.7

RESERVOIR PROPERTIES
RANGE IN RES TEMP 90 C TO 125 C ASSUMED
BEST EST. AVER. TEMP 120.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.05 TO 0.25 E18 CAL; BEST ESTIMATE 0.14 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

210
GEOPHYSICAL SURVEYS:
DEVELOPMENTS:
REFERENCES: WARING, 1965; YOUNG AND MITCHELL, 1973; ANDERSON, 1931

TOPO MAPS: BASIN 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO, PART 1, 1973, IDAHO DEPT. OF
WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30, MIXING MODEL SUGGESTS 195C.

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: OAKLEY WARM SPRING, ID

INPUT RECORD # 174 MIRRORED ON 3/76
NAME: RAFT RIVER ,ID RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARNING FIG: 4 NUMBER: 184 DATE: 04/75
LOCATION:

STATE: ID COUNTY: CASSIA
LATITUDE: 42 6.10 TOWNSHIP: 15S
LONGITUDE: 113 22.80 RANGE: 26E
ELEV: 4850 SECTION: 23 , 1/4 1/4 B&M: BOISE
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: PLIOCENE-PLEISTOCENE RIVER & FAN DEP, MIOCENE-PLIOCENE INTRUSIVES & LAVAS, SILICIC
SURFACE DISCHARGE TOTAL: 227.0 L/MIN MEASURED X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP.

MAX. WELL TEMP 140 C AT 1400 M DEPTH BOTTOM HOLE TEMP. 140 C AT 400 M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	MC03
96	0.0	7.70	97.00	1110.00	35.00	130.00	61.0	900.0	36

OTHER CHEMICAL DATA TABLE 2, REF. CITED (WELL IN SE1/4 SE1/4 SEC 23)

SI02	SI02	SI02	NA_K_CA	OTHER
ADIAHATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
131.3	135.9	107.3	139.2	131.9

RESERVOIR PROPERTIES

RANGE IN RES TEMP 130 C TO 170 MEASURED

BEST EST. AVER. TEMP 140.0

AREA 4.0 TO 44.0 KM**2; BEST ESTIMATE 20.0 KM**2

BASED ON GEOPHYSICS, GEOLOGY

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 4.00 TO 88.00 KM**3; BEST ESTIMATE 30.00 KM**3

HEAT CONTENT > 15 C 0.20 TO 8.20 E18 CAL; BEST ESTIMATE 2.30 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW 226800 TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: NACE ET AL, 61; WILLIAMS AND OTHERS, 1974; U.S. GEOL. SURVEY, 1974; MABEY AND WILSON, 1974; WILSON A
NO MABEY, 1974; HOOVER, 1974; YOUNG AND MITCHELL, 1973; NACE AND OTHERS, 1961

TOPO MAPS: CHOKECHERRY 1:24,000; "WELL (HOT)"

SPRING IDENTIFIED: YES

COMMENTS:

ERDA WELL TO 1400M DEPTH, B.M. TEMP 140C SHUT IN PSI 55; FLOWING TEMPERATURE REPORTED AS 96C, FLOWING 3800 LPM

PREPARED BY: PETER OBERLINDACHER, J. RENNER, D. WILLIAMS

NAME: RAFT RIVER , ID

INPUT RECORD # 175 MIRRORED ON 3/76
NAME: MAPLE GROVE H.S. ,ID RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WAKING FIG: NUMBER: DATE: 03/75

LOCATION:

STATE: ID COUNTY:FRANKLIN
LATITUDE: 42 18.23 TOWNSHIP: 13S
LONGITUDE: 111 42.24 RANGE: 41E
ELEV: 5000 SECTION: 7 ,SW1/4 NE1/4 H&M: BOISE
SURFACE MANIFESTATIONS: TRAVERTINE,HOT SPRING(S).

ROCK AND STRUCTURE TYPE: PALEOZOIC QTZITE(?)
SURFACE DISCHARGE TOTAL: 1323.0 L/MIN MEASURED X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: NUMEROUS

TEMPERATURE: RANGE OF SPRING TEMP. 76 C OR

MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
76	0.0	7.30	55.00	490.00	110.00	89.00	260.0	630.0	491

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
106.4	106.8	75.1	236.2	187.2

RESERVOIR PROPERTIES

RANGE IN RES TEMP 105 C TO 235 C ASSUMED

BEST EST. AVER. TEMP 110.0

AREA 1.0 TO 3.0 KM**2;BEST ESTIMATE 2.0 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 6.00 KM**3; BEST ESTIMATE 3.00 KM**3

HEAT CONTENT > 15 C 0.05 TO 0.79 E18 CAL; BEST ESTIMATE 0.17 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: DION, 1969; YOUNG AND MITCHELL, 1973

TOPO MAPS: ONEIDA NARROW RESERVOIR 1:24,000; PRESTON 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO, PART 1, 1973. IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: MAPLE GROVE H.S. , ID

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INPUT RECORD # 176. MIRRORED ON 3/76
NAME: WELL NEAR RIVERDALE .ID RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 03/75

LOCATION:

STATE: ID COUNTY: FRANKLIN
LATITUDE: 42 9.86 TOWNSHIP: 14S
LONGITUDE: 111 50.38 RANGE: 39E
ELEV: 4750 SECTION: 36 ,SE1/4 NE1/4 B&M: BOISE

SURFACE MANIFESTATIONS: FOUND BY DRILLING

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM
SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP.

MAX. WELL TEMP 44 C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03
45	0.0	7.30	80.00	360.00	24.00	25.00	15.0	320.0	524

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY		
122.5	125.5	95.7	1/3 170.4	4/3 147.5

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 175 C ASSUMED

BEST EST. AVER. TEMP 125.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.05 TO 0.38 E18 CAL; BEST ESTIMATE 0.15 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: DION, 1969; YOUNG AND MITCHELL, 1973

TOPO MAPS: RIVERDALE 1:24,000; PRESTON, 1:250,000

SPRING IDENTIFIED: NO

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO, PART 1, 1973, IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30. WELL DEPOSITS TRAVERTINE.

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: WELL NEAR RIVERDALE .ID

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INPUT RECORD # 177 MIRRORED ON 3/76
NAME: WAYLAND H.S. , ID RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 03/75

LOCATION:

STATE: ID COUNTY: FRANKLIN
LATITUDE: 42 8.23 TOWNSHIP: 155
LONGITUDE: 111 56.85 RANGE: 39E
ELEV: 4580 SECTION: 8 .SE1/4 NW1/4 B&M: BOISE
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM IN TRAVERTINE DEPOSITS

SURFACE DISCHARGE TOTAL: 3402.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP. 77 C OR

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03
77	0.0	7.00	80.00	3100.00	660.00	160.00	50.0	5400.0	699

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
122.5	125.5	95.7	270.1	336.2

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 275

BEST EST. AVER. TEMP 130.0

AREA 1.0 TO 6.0 KM**2; BEST ESTIMATE 5.0 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 12.00 KM**3; BEST ESTIMATE 7.50 KM**3

HEAT CONTENT > 15 C 0.05 TO 1.90 E18 CAL; BEST ESTIMATE 0.52 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: DION, 1969; YOUNG AND MITCHELL, 1973

TOPO MAPS: BANIDA 1:24,000 , PRESTON 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO, PART 1, 1973, IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: WAYLAND H.S. , ID

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INPUT RECORD # 178 MIRRORED ON 3/76
NAME: WELL NEAR NEWDALE ,ID RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 03/75

LOCATION:

STATE: ID COUNTY:FREMONT
LATITUDE: 43 53.15 TOWNSHIP: 07N
LONGITUDE: 111 35.41 RANGE: 41E
ELEV: 5130 SECTION: 35 SE1/4 SW1/4 R6M: HOISE

SURFACE MANIFESTATIONS: FOUND BY DRILLING

ROCK AND STRUCTURE TYPE: TERTIARY SILICIC VOLCANIC ROCKS(?) (YOUNG AND MITCHELL,1973)

SURFACE DISCHARGE TOTAL: L/MIN

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP.

MAX. WELL TEMP 36 C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
36	0.0	7.90	75.00	78.00	8.60	28.00	33.0	24.0	240

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED. SAMPLE FROM WELL

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
119.0	122.2	92.0	169.1	83.7

RESERVOIR PROPERTIES

RANGE IN RES TEMP 80 C TO 130 C ASSUMED

BEST EST. AVER. TEMP 125.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.04 TO 0.28 E18 CAL; BEST ESTIMATE 0.15 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: YOUNG AND MITCHELL, 1973

TOPO MAPS: NEWDALE 1:24,000

SPRING IDENTIFIED: NO

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO, PART 1, 1973, IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: WELL NEAR NEWDALE . ID

2/5

INPUT RECORD # 179. MIRRORED ON 3/76
NAME: ASHTON WARM SPRING .ID RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 03/75

LOCATION:

STATE: ID COUNTY: FREMONT
LATITUDE: 44 5.70 TOWNSHIP: 09N
LONGITUDE: 111 27.54 RANGE: 42E
ELEV: 5190 SECTION: 23 .NE1/4 SE1/4 H&M: HOISE
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: PLEISTOCENE BASALT
SURFACE DISCHARGE TOTAL: 8.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP. 41 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/72 SOURCE: YOUNG AND MITCHELL, 1973
SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
41	0.0	7.60	110.00	36.00	1.60	1.10	4.7	2.9	92

OTHER CHEMICAL DATA TABLE 2, REFERENCE CITED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
137.2	142.9	115.2	139.0	91.2

RESERVOIR PROPERTIES

RANGE IN RES TEMP 90 C TO 150 C ASSUMED
BEST EST. AVER. TEMP 145.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.05 TO 0.32 E18 CAL; BEST ESTIMATE 0.18 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

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GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: STEARNS AND OTHERS, 1939; YOUNG AND MITCHELL, 1973

TOPO MAPS: ASHTON 1:24,000

SPRING IDENTIFIED: NO

COMMENTS:

SPRING AND WELL LOCATIONS SHOWN ON FIG. 4 IN GEOTHERMAL INVESTIGATIONS IN IDAHO, PART 1, 1973. IDAHO DEPT. OF WATER ADMINISTRATION WATER INFORMATION BULL. NO. 30

PREPARED BY: PETER OBERLINDACHER, J. RENNER

NAME: ASHTON WARM SPRING . ID

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Selected Geothermal Resources Assessment Data

Hydrothermal Convection Systems in Montana

By: J. L. Renner, Denver, Colorado

Contents

Hot-Spring Data Sheets

Hot water greater than 150°C

Hot water from 90° to 150°C

References

INPUT RECORD # 180 MIRRORED ON 3/76
NAME: HELENA HOT SPRINGS (BROADWATER), MONT RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 2 NUMBER: 7 DATE: 03/75

LOCATION:

STATE: MONT COUNTY: LEWIS AND CLARK
LATITUDE: 46 36.50 TOWNSHIP: 10N
LONGITUDE: 112 5.00 RANGE: 04W
ELEV: 3900 SECTION: 23, 1/4 1/4 B&M: MONTANA
SURFACE MANIFESTATIONS: HOT SPRING(S),

ROCK AND STRUCTURE TYPE: LOWER PALEOZOIC SEDS, DOLOMITE
SURFACE DISCHARGE TOTAL: 110.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 2

TEMPERATURE: RANGE OF SPRING TEMP. 50 C TO 65 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/74 SOURCE: MARINER UNPUBLISHED USGS DATA

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03
62	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER		
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	SI02	CHAL	NA-K-C
0.0	0.0	0.0	0.0	136	96	135

RESERVOIR PROPERTIES

RANGE IN RES TEMP 0 C TO 0
BEST EST. AVER. TEMP 140.0
AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.12 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

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GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1965; KNOPF, 1963; PERRY 1949

TOPO MAPS: HELENA 1:62,500

SPRING IDENTIFIED:NO

COMMENTS:

PREPARED BY:RENNER

NAME: HELENA HOT SPRINGS (BROADWATER) . MONT

INPUT RECORD # 181 MIRRORED ON 3/76
NAME: WHITE SULPHUR SPRINGS, MONT RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WAKING FIG: 2 NUMBER: 24 DATE: 04/75

LOCATION:

STATE: MONT COUNTY: MEAGHER
LATITUDE: 46 32.80 TOWNSHIP: 09N
LONGITUDE: 110 54.20 RANGE: 06E
ELEV: 5020 SECTION: 18 NW1/4 NW1/4 B&M: MONTANA

SURFACE MANIFESTATIONS:

ROCK AND STRUCTURE TYPE: MIOCENE LAKE BEDS OVERLYING BELT SUPERGROUP

SURFACE DISCHARGE TOTAL: 1900.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 9

TEMPERATURE: RANGE OF SPRING TEMP. 40 C TO 57 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/74 SOURCE: MARINER UNPUBLISHED USGS DATA

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
46	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0

OTHER CHEMICAL DATA MIXING SUGGESTS 150C

SI02	SI02	SI02	NA_K_CA	OTHER				
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	SI02	CHAL	NA-K-C		
0.0	0.0	0.0	0.0	0.0	0.0	103	74	148

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 150 C ASSUMED

BEST EST. AVER. TEMP 150.0

AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.18 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1965; WEED, W.H., AND PIRSSON, L.V., 1896; GROFF, S.L., 1965; WEED 1898

TOPO MAPS: WHITE SULPHUR SPRINGS 1:24,000

SPRING IDENTIFIED: YES

COMMENTS:

ABOUT 100 SPRINGS, MIXING INDICATES 150C

PREPARED BY: J. RENNER

NAME: WHITE SULPHUR SPRINGS, MONT

224

INPUT RECORD # 182 MIRRORED ON 3/76
NAME: ALHAMBRA MONT RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 2 NUMBER: 18 DATE: 03/75

LOCATION:

STATE: MONT COUNTY: JEFFERSON

LATITUDE: 46 27.00 TOWNSHIP: 08N

LONGITUDE: 111 59.00 RANGE: 03W

ELEV: 4280 SECTION: 16 .NE1/4 NW1/4 B&M: MONTANA

SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: TERTIARY INTRUSIVES

SURFACE DISCHARGE TOTAL: L/MIN

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 22

TEMPERATURE: RANGE OF SPRING TEMP. 53 C TO 59 C OR

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/74 SOURCE: MARINER UNPUBLISHED USGS DATA

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SG4	CL	HC03
56	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	SI02
0.0	0.0	0.0	0.0	115
				CHAL 86
				NA-K-C 111

RESERVOIR PROPERTIES

RANGE IN RES TEMP 0 C TO 0

BEST EST. AVER. TEMP 120.0

AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.14 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1965; ROBERTS AND GUDE, 1953; WEEB 1912;

TOPO MAPS: CLANCY 1:62,500

SPRING IDENTIFIED:NO

COMMENTS:

PREPARED BY:RENNER

NAME: ALHAMBRA MONT

225

INPUT RECORD # 183 MIRRORED ON 3/76
NAME: BOULDER, MONT RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 2 NUMBER: 19 DATE: 03/75

LOCATION:

STATE: MONT COUNTY: JEFFERSON
LATITUDE: 46 12.00 TOWNSHIP: 05N
LONGITUDE: 112 5.60 RANGE: 04W
ELEV: 4840 SECTION: 10 NE1/4 SW1/4 B&M: MONTANA
SURFACE MANIFESTATIONS: SINTER, HOT SPRING(S),

ROCK AND STRUCTURE TYPE: FISSURED GRANITE
SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: MANY (2 GROUPS)

TEMPERATURE: RANGE OF SPRING TEMP. 62 C TO 76 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/74 SOURCE: MARINER UNPUBLISHED USGS DATA
SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
62	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	SI02
0.0	0.0	0.0	0.0	143
				98
				135

RESERVOIR PROPERTIES

RANGE IN RES TEMP 0 C TO 0
BEST EST. AVER. TEMP 145.0
AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM,
VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.15 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1965; WHITE, 1955; WEED, 1900, 1912, 1905

TOPO MAPS: BOULDER 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

PREPARED BY: RENNER

NAME: BOULDER, MONT

226

INPUT RECORD # 184 MIRRORED ON 3/76
NAME: GREGSON HOT SPRINGS, MONT RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WAKING FIG: 2 NUMBER: 17 DATE: 03/75

LOCATION:

STATE: MONT COUNTY: SILVER HOW
LATITUDE: 46 2.60 TOWNSHIP: 03N
LONGITUDE: 112 48.40 RANGE: 10W
ELEV: 5140 SECTION: 2, SE1/4 NW1/4 B&M: MONTANA
SURFACE MANIFESTATIONS: HOT SPRING(S),

ROCK AND STRUCTURE TYPE: TERTIARY RHYOLITE, QUARTZ MONZONITE

SURFACE DISCHARGE TOTAL: L/MIN

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: SEVERAL

TEMPERATURE: RANGE OF SPRING TEMP. 67 C TO 74 C OR

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/74 SOURCE: MARINER UNPUBLISHED USGS DATA

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HCO3
74	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0

OTHER CHEMICAL DATA

SI02 ADIABATIC	SI02 CONDUCTIVE	SI02 CHALCEDONY	NA_K_CA	OTHER SI02	CHAL	NA-K-C
0.0	0.0	0.0	1/3 0.0	4/3 0.0	128	93 126

RESERVOIR PROPERTIES

RANGE IN RES TEMP 0 C TO 0

BEST EST. AVER. TEMP 130.0

AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.14 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1965; KONIZESKI, R.L. ETAL, 1962

TOPO MAPS: ANACONDA 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

PREPARED BY: RENNEN

NAME: GREGSON HOT SPRINGS, MONT

227

INPUT RECORD # 185 MIRRORED ON 3/76
NAME: PIPESTONE MONT RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 2 NUMBER: 20 DATE: 03/75
LOCATION:

STATE: MONT COUNTY: JEFFERSON
LATITUDE: 45 53.80 TOWNSHIP: 02N
LONGITUDE: 112 13.90 RANGE: 05W
ELEV: 4540 SECTION: 28 .SE1/4 NW1/4 B&M: MONTANA
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: GRANITE
SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: SEVERAL

TEMPERATURE: RANGE OF SPRING TEMP. 61 C OR HOT
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH
CHEMICAL DATA ANALYSIS DATE 00/74 SOURCE: MARINER UNPUBLISHED USGS DATA

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
57	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0

OTHER CHEMICAL DATA

SI02 ADIABATIC	SI02 CONDUCTIVE	SI02 CHALCEDONY	NA_K_CA	OTHER SI02	CHAL	NA-K-C
0.0	0.0	0.0	1/3 0.0	4/3 0.0	115 72	113

RESERVOIR PROPERTIES

RANGE IN RES TEMP 0 C TO 0
BEST EST. AVER. TEMP 120.0
AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.14 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

228
GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: PROSTKA, 1966; WARING, 1965; WEED, 1912

TOPO MAPS: DRY MOUNTAIN 1:24,000

SPRING IDENTIFIED: YES

COMMENTS:

PREPARED BY: RENNER

NAME: PIPESTONE MONT

INPUT RECORD # 186 MIRRORED ON 3/76
NAME: BARKELS (SILVER STAR) HOT SPRINGS, MONT RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 2 NUMBER: 30 DATE: 03/75

LOCATION:

STATE: MONT COUNTY: MADISON

LATITUDE: 45 41.50 TOWNSHIP: 02S

LONGITUDE: 112 17.20 RANGE: 06W

ELEV: 4600 SECTION: 1 1/4 1/4 B&M: MONTANA

SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: LAKE BEDS OVERLYING GRANITE

SURFACE DISCHARGE TOTAL: 200.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 4

TEMPERATURE: RANGE OF SPRING TEMP. 71 C TO 72 C OR HOT

MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/74 SOURCE: MARINER, UNPUBLISHED USGS DATA

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
72	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	SI02
0.0	0.0	0.0	0.0	143
				CHAL 110
				NA-K-C 139

RESERVOIR PROPERTIES

RANGE IN RES TEMP 0 C TO 0

BEST EST. AVER. TEMP 145.0

AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.14 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: SAHINEN, 1939; WARING, 1965; WINCHELL, A. N., 1914

TOPO MAPS: TWIN BRIDGES 1:62,500

SPRING IDENTIFIED: NO

COMMENTS:

PREPARED BY: RENNER

NAME: BARKELS (SILVER STAR) HOT SPRINGS, MONT

229

INPUT RECORD # 187 MIRRORED ON 3/76
NAME: NORRIS (HAPGOOD), MONT RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARING FIG: 2 NUMBER: 32 DATE: 03/75

LOCATION:

STATE: MONT COUNTY: MADISON
LATITUDE: 45 34.60 TOWNSHIP: 03S
LONGITUDE: 111 41.00 RANGE: 01W
ELEV: 4820 SECTION: 14 .NE1/4 SE1/4 B&M; MONTANA

SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: SYENITE
SURFACE DISCHARGE TOTAL: 200.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 5

TEMPERATURE: RANGE OF SPRING TEMP. 52 C OR

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/74 SOURCE: MARINER, UNPUBLISHED USGS DATA

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
52	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	SI02
0.0	0.0	0.0	0.0	130
			4/3	CHAL
			0.0	100
				NA-K-C
				153

RESERVOIR PROPERTIES

RANGE IN RES TEMP 0 C TO 0

BEST EST. AVER. TEMP 150.0

AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.14 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: PEALE, A. C., 1896; WARING, 1965

TOPO MAPS: NORRIS 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

NO MODERN MAPPING. OLD MAPS SHOW NO FAULTS. IN AN AREA OF TERTIARY AU-AG MINERALIZATION.

PREPARED BY: RENNER

NAME: NORRIS (HAPGOOD), MONT

280

INPUT RECORD # 188 MIRRORED ON 3/76
NAME: JARDINE (JACKSON OR BIG HOLE) ,MONT RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 2 NUMBER: 25 DATE: 04/75

LOCATION:

STATE: MONT COUNTY: BEAVERHEAD
LATITUDE: 45 21.80 TOWNSHIP: 05S
LONGITUDE: 113 24.70 RANGE: 15W
ELEV: 6500 SECTION: 26 . 1/4 1/4 B&M: MONTANA

SURFACE MANIFESTATIONS:

ROCK AND STRUCTURE TYPE: TERTIARY STRATA OVERLYING BELT SUPERGROUP
SURFACE DISCHARGE TOTAL: 5700.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: ABOUT 100

TEMPERATURE: RANGE OF SPRING TEMP. 58 C OR

MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/74 SOURCE: MARINER - UNPUBLISHED USGS DATA

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03
58	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0

OTHER CHEMICAL DATA MIXING INDICATES 150C

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	SI02
0.0	0.0	0.0	0.0	104
			4/3	75
				148

RESERVOIR PROPERTIES

RANGE IN RES TEMP 0 C TO 0 C ASSUMED

BEST EST. AVER. TEMP 150.0

AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.18 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1965

TOPO MAPS: DILLON, MONT 1:250,000

SPRING IDENTIFIED:NO

COMMENTS:

MIXING INDICATES 150C

PREPARED BY: J. RENNEN

NAME: JARDINE (JACKSON OR BIG HOLE) . MONT

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Selected Geothermal Resources Assessment Data

Hydrothermal Convection Systems in Nevada

By: E. A. Johnson, Menlo Park, California

J. L. Renner, Denver, Colorado

and

K. E. Telleen, Menlo Park, California

Contents

Hot-Spring Data Sheets

Hot water greater than 150°C

Hot water from 90° to 150°C

References

INPUT RECORD # 189 MIRRORED ON 3/76
NAME: BALTAZOR HOT SPRINGS, NEVADA RESOURCE CATEGORY: HOT WATER > 150 C
WARNING FIG: NUMBER: DATE: 01/75
LOCATION:

STATE: NEVADA COUNTY: HUMBOLDT
LATITUDE: 41 55.34 TOWNSHIP: 46N
LONGITUDE: 118 42.65 RANGE: 28E
ELEV: 4213 SECTION: 13 NW1/4 1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONS: HOT SPRING(S), SINTER, TRAVERTINE,

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM; TERTIARY VOLCANICS; CRETACEOUS GRANODIORITE

SURFACE DISCHARGE TOTAL: 100.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP. 80 C TO

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/73 SOURCE: MARINER & OTHERS, 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
80	0.0	8.00	160.00	180.00	8.70	8.40	220.0	48.0	139

OTHER CHEMICAL DATA SEE COMMENTS

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
156.1	165.5	141.0	152.0	124.6

RESERVOIR PROPERTIES

RANGE IN RES TEMP 150 C TO 175 C ASSUMED

BEST EST. AVER. TEMP 170.0

AREA 1.0 TO 4.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.50 KM TO 1.50 KM; BEST ESTIMATE 1.00 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.50 TO 2.50 KM; BEST ESTIMATE 2.00 KM.

VOLUME 1.50 TO 6.00 KM**3; BEST ESTIMATE 3.00 KM**3

HEAT CONTENT > 15 C 0.12 TO 0.58 E18 CAL; BEST ESTIMATE 0.28 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER & OTHERS, 1974; WILDEN, 1964

TOPO MAPS: DENIO 1:62,500; VYA 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

LOW CA. (MAY BE A MIXED WATER THOUGH CHLORIDE & MAGNESIUM ARE LOW). GEOTHERMAL SYSTEM MAY BE LARGER, HIGH HEAT FLOW NEARBY; SOUTHERLY EXTENSION OF ALVORD DESERT, OREGON AREA; FLOWING WELL DISCHARGING 25 LPM, 90C.

PREPARED BY: E. A. JOHNSON, J. RENNER

NAME: BALTAZOR HOT SPRINGS, NEVADA

235

INFO RECORD # 190 MIRRORED ON 3/76
NAME: EAST & WEST PINTO HOT SPRINGS, NEVADA RESOURCE CATEGORY: HOT WATER > 150 C
WARNING FIG: 8 NUMBER: 9 DATE: 01/75
LOCATION:

STATE: NEVADA COUNTY: HUMBOLDT
LATITUDE: 41 21.00 TOWNSHIP: 40N
LONGITUDE: 118 47.00 RANGE: 28E
ELEV: 4500 SECTION: 19, SE1/4 NE1/4 36M: M.O.M.
SURFACE MANIFESTATIONS: SINTER, TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: CRETACEOUS OR TERTIARY GRANODIORITE

SURFACE DISCHARGE TOTAL: 500.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 2 (WELL AT WEST PINTO)

TEMPERATURE: RANGE OF SPRING TEMP. 93 C TO

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03
93	0.0	7.14	150.00	330.00	23.00	14.00	120.0	160.0	495

OTHER CHEMICAL DATA SEE COMMENTS

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	NA-K
152.7	161.4	136.3	176.3	145
			4/3	
			162.7	

RESERVOIR PROPERTIES

RANGE IN RES TEMP 150 C TO 180 C ASSUMED

BEST EST. AVER. TEMP 165.0

AREA 1.0 TO 7.0 KM**2; BEST ESTIMATE 5.0 KM**2

BASED ON GEOLOGY, SURFACE EXPRESSION

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 14.00 KM**3; BEST ESTIMATE 7.50 KM**3

HEAT CONTENT > 15 C 0.08 TO 1.40 E18 CAL; BEST ESTIMATE 0.68 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; WARING, 1965; WILUEN, 1964;

TOPO MAPS: VYA 1:250,000

SPRING IDENTIFIED: NO

COMMENTS:

TWO AREAS PROBABLY INTERCONNECTED, 2 SPRINGS IN EASTERN AREA DEPOSITING TRAVERTINE, 1 WELL IN WESTERN AREA. NA
-K-CA MAY BE TOO HIGH

PREPARED BY: E. A. JOHNSON, J. RENNER

NAME: EAST & WEST PINTO HOT SPRINGS, NEVADA

236

INPUT RECORD # 191 MIRRORED ON 3/76
NAME: GREAT BOILING SPRINGS (GERLACH), NEVADA RESOURCE CATEGORY: HOT WATER > 150 C
WARING FIG: 8 NUMBER: 38 DATE: 01/75
LOCATION:

STATE: NEVADA COUNTY: WASHOE
LATITUDE: 40 39.72 TOWNSHIP: 32N
LONGITUDE: 119 21.74 RANGE: 23E
ELEV: 3960 SECTION: 15 ,NW1/4 1/4 8&M: MT. DIABLO
SURFACE MANIFESTATIONS: SINTER, HOT SPRING(S),

ROCK AND STRUCTURE TYPE: CRETACEOUS OR TERTIARY GRANODIORITE; QUATERNARY ALLUVIUM & LAKE SEDIMENTS

SURFACE DISCHARGE TOTAL: 1000.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: 2.04E+03 L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 7.00E+06 CAL/SEC

AREA OF SURFACE EX: 0.6 KM**2

APPROX. # OF HOT SPRINGS: 2 MAJOR GROUPS & 4 OTHERS

TEMPERATURE: RANGE OF SPRING TEMP. 20 C TO 90 C OR

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. 110 C AT 150 M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
86	0.0	7.20	165.00	1400.00	130.00	68.00	400.0	2200.0	83

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
AQUIFAC	CONDUCTIVE	CHALCEDONY	1/3	NA-K
157.7	167.4	143.3	204.9	175

RESERVOIR PROPERTIES

RANGE IN RES TEMP 0 C TO 0

BEST EST. AVER. TEMP 170.0

AREA 2.5 TO 30.0 KM**2; BEST ESTIMATE 10.0 KM**2

BASED ON GEOLOGY, TEMP GRADIENT

DEPTH TO TOP OF RES. 0.50 KM TO 1.50 KM; BEST ESTIMATE 0.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.50 TO 2.50 KM; BEST ESTIMATE 2.50 KM.

VOLUME 3.75 TO 75.00 KM**3; BEST ESTIMATE 25.00 KM**3

HEAT CONTENT > 15 C 0.35 TO 7.00 E18 CAL; BEST ESTIMATE 2.30 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: BONHAM, 1969; MARINER AND OTHERS, 1974; OLMSTED AND OTHERS, 1975; WARING, 1965

TOPO MAPS: GERLACH 1:62,500, LOVELOCK 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

HIGH CHLORIDE: 150M WELL FLOWS AT 110C

PREPARED BY: E. A. JOHNSON, J. RENNER

NAME: GREAT BOILING SPRINGS (GERLACH), NEVADA

237

INPUT RECORD # 192 MIRRORED ON 3/76
NAME: HOT SULPHUR SPRINGS (TUSCARORA), NEVADA RESOURCE CATEGORY: HOT WATER > 150 C
WARNING FIG: NUMBER: DATE: 01/75

LOCATION:

STATE: NEVADA COUNTY: ELKO
LATITUDE: 41 28.20 TOWNSHIP: 41N
LONGITUDE: 116 9.00 RANGE: 52E
ELEV: 5800 SECTION: 8, SE1/4 NE1/4 B6M: MT. DIABLO
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: TERTIARY LACUSTRINE ROCKS
SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP. 90 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: HOSE AND TAYLOR, 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HCO3
90	0.0	7.30	165.00	160.00	16.00	12.00	61.0	22.0	345

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
157.7	167.4	143.3	184.2	138.9

RESERVOIR PROPERTIES

RANGE IN RES TEMP 155 C TO 190 C ASSUMED
BEST EST. AVER. TEMP 185.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.08 TO 0.42 E18 CAL; BEST ESTIMATE 0.23 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO DARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: GRANGER AND OTHERS, 1957; HOSE AND TAYLOR, 1974; MARINER AND OTHERS, 1974

TOPO MAPS: TUSCARORA 1:62,500, WINNEMUCCA 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

SPRINGS WITH ABUNDANT SULFUR

PREPARED BY: E. A. JOHNSON, J. RENNER

NAME: HOT SULPHUR SPRINGS (TUSCARORA), NEVADA

238

INPUT RECORD # 193 MIRRORED ON 3/76
NAME: UNNAMED HOT SPRINGS NEAR WELLS, NEVADA RESOURCE CATEGORY: HOT WATER > 150 C
WARNING FIG: 3 NUMBER: 30A DATE: 01/75

LOCATION:

STATE: NEVADA COUNTY: ELKO
LATITUDE: 41 10.91 TOWNSHIP: 38N
LONGITUDE: 114 59.37 RANGE: 62E
ELEV: 5760 SECTION: 17 NW1/4 NE1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONSS: HOT SPRING(S),

ROCK AND STRUCTURE TYPE: TERTIARY LACUSTRINE ROCKS
SURFACE DISCHARGE TOTAL: 45.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 3

TEMPERATURE: RANGE OF SPRING TEMP. 61 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
61	0.0	7.30	105.00	300.00	31.00	75.00	32.0	27.0	1135

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
135.0	140.3	112.3	180.7	123.8

RESERVOIR PROPERTIES

RANGE IN RES TEMP 140 C TO 190 C ASSUMED
BEST EST. AVER. TEMP 180.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.08 TO 0.42 E18 CAL; BEST ESTIMATE 0.22 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; WARING, 1965; GRANGER & OTHERS, 1957

TOPO MAPS: OXLEY PEAK 1:24,000, WELLS 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

POSSIBLY MIXED WATER, MAY BE PART OF A MORE EXTENSIVE SYSTEM EXTENDING FOR 4.8KM ALONG WEST EDGE OF SNAKE MTNS

PREPARED BY: E. A. JOHNSON, J. RENNER

NAME: UNNAMED HOT SPRINGS NEAR WELLS, NEVADA

239

INPUT RECORD # 194 MIRRORED ON 3/76
NAME: SULPHUR HOT (HOT SULPHUR) SPRINGS, NEVADA RESOURCE CATEGORY: HOT WATER > 150 C
WARNING FIG: NUMBER: DATE: 01/75

LOCATION:

STATE: NEVADA COUNTY: ELKO
LATITUDE: 40 35.20 TOWNSHIP: 31N
LONGITUDE: 115 17.08 RANGE: 59E
ELEV: 6050 SECTION: 11 NW1/4 1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONS: SINTER, HOT SPRING(S).

IC ROCKS

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM; UPPER MESOZOIC GRANITE; PRECAMBRIAN THRU PALEOZOIC METAMORPH

SURFACE DISCHARGE TOTAL: 500.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: 5.50E+02 L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 1.60E+00 CAL/SEC

AREA OF SURFACE EX: 0.5 KM**2
APPROX. # OF HOT SPRINGS: 101

TEMPERATURE: RANGE OF SPRING TEMP. 45 C TO 93 C ON
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
93	0.0	8.53	210.00	135.00	8.90	1.00	40.0	23.0	244

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
170.9	183.4	162.0	181.0	189.9

RESERVOIR PROPERTIES

RANGE IN RES TEMP 170 C TO 200 C ASSUMED
BEST EST. AVER. TEMP 190.0
AREA 2.0 TO 10.0 KM**2; BEST ESTIMATE 4.0 KM**2
BASED ON GEOLOGY, SURFACE EXPRESSION, TEMP GRADIENT
DEPTH TO TOP OF RES. 0.50 KM TO 1.00 KM; BEST ESTIMATE 0.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 2.00 TO 2.50 KM; BEST ESTIMATE 2.50 KM.
VOLUME 4.00 TO 25.00 KM**3; BEST ESTIMATE 10.00 KM**3
HEAT CONTENT > 15 C 0.37 TO 2.80 E18 CAL; BEST ESTIMATE 1.05 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: GRANGER AND OTHERS, 1957; MARINER AND OTHERS, 1974; OLMSTED AND OTHERS, 1975

TOPO MAPS: LAMOILLE 1:62,500, ELKO 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

ABUNDANT SINTER

PREPARED BY: E. A. JOHNSON, J. RENNER

NAME: SULPHUR HOT (HOT SULPHUR) SPRINGS, NEVADA

INPUT RECORD # 195 MIRRORED ON 3/76
NAME: BEOWAVE , NEVADA RESOURCE CATAGORY: HOT WATER > 150 C
WARNING FIG: 8 NUMBER: 77A DATE: 01/75

LOCATION:

STATE: NEVADA COUNTY: EUREKA
LATITUDE: 40 34.20 TOWNSHIP: 31N
LONGITUDE: 116 34.80 RANGE: 48E
ELEV: 5000 SECTION: 17 , NW 1/4 1/4 H&M: MUM
SURFACE MANIFESTATIONS: SINTER, HOT SPRING(S), GEYSER(S), FUMAROLE OR WARM VAPOR,

ROCK AND STRUCTURE TYPE: TERTIARY BASALT, QUATERNARY ALLUVIUM

SURFACE DISCHARGE TOTAL: L/MIN

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 1.6 KM**2

APPROX. # OF HOT SPRINGS: 15

TEMPERATURE: RANGE OF SPRING TEMP. 50 C TO 98 C OR

MAX. WELL TEMP 212 C AT 220 M DEPTH

BOTTOM HOLE TEMP. 212 C AT 220 M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03
0	0.0	9.38	500.00	250.00	38.00	1.30	64.0	70.0	505

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY		
225.7	251.9	245.8	1/3	4/3
			242.5	292.1

RESERVOIR PROPERTIES

RANGE IN RES TEMP 165 C TO 280 C ASSUMED

BEST EST. AVER. TEMP 240.0

AREA 0.6 TO 31.0 KM**2; BEST ESTIMATE 21.0 KM**2

BASED ON GEOLOGY, GEOPHYSICS, EXPLORATION

DEPTH TO TOP OF RES. 0.50 KM TO 1.50 KM; BEST ESTIMATE 1.00 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.50 TO 2.50 KM; BEST ESTIMATE 2.00 KM.

VOLUME 0.90 TO 77.50 KM**3; BEST ESTIMATE 42.00 KM**3

HEAT CONTENT > 15 C 0.10 TO 12.30 E18 CAL; BEST ESTIMATE 5.70 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR: WELL DIAMETER CM

GEOPHYSICAL SURVEYS: GRAVITY, MAG

DEVELOPMENTS: 9 WELLS 131M TO 3000M; TEMPS TO 212C

REFERENCES: GILLULY AND GATES, 1975; STEWART AND MCKEE, 1970; ZOBACK, 1974; MARINER AND OTHERS, 1974; MABEY, 196

; ROBINSON, 1970; HOSE AND TAYLOR, 1974

TOPO MAPS: DUNPHY 1:62,500; WINNEMUCCA 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

PRIOR TO EXPLORATION ABOUT 50 SPRINGS AND SMALL GEYSERS DISCHARGING ABOUT 400 LPM. RESERVOIR AREA MINIMUM

- SURFACE EXPRESSION MAX ROUGHLY 3 KM WIDE STRIP ALONG MAJOR BASIN RANGE FAULT FROM SEC 35 T30N R47E

TO SEC 2 T30N R 48E. MOST LIKELY - ROUGHLY 3 KM WIDE STRIP FROM APPROX. 1.5 KM, SW OF CHEVRON WELL IN SEC

13 T 30N R 47E TO MAJOR CROSS VALLEY FAULT IN SECS 4 & 10 T30N R48E.

PREPARED BY: E. A. JOHNSON, J. RENNER

NAME: BEOWAVE , NEVADA

INPUT RECORD # 196 MIRRORED ON 3/76
NAME: KYLE HOT SPRINGS, NEVADA RESOURCE CATEGORY: HOT WATER > 150 C
WARNING FIG: 8 NUMBER: 66 DATE: 01/75

LOCATION:

STATE: NEVADA COUNTY: PERSHING
LATITUDE: 40 24.45 TOWNSHIP: 29N
LONGITUDE: 117 52.87 RANGE: 36E
ELEV: 4560 SECTION: 1 SW1/4 1/4 BLM: MT. DIABLO
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S)

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM; PALEOZOIC METAMORPHIC ROCKS
SURFACE DISCHARGE TOTAL: 20.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: SEVERAL
TEMPERATURE: RANGE OF SPRING TEMP. 77 C TO 38 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER AND OTHERS, 1974

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
77	0.0	6.50	150.00	540.00	80.00	95.00	51.0	770.0	544

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
152.7	161.4	138.3	210.7	169.5

RESERVOIR PROPERTIES

RANGE IN RES TEMP 150 C TO 200 C ASSUMED
BEST EST. AVER. TEMP 180.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.08 TO 0.44 E18 CAL; BEST ESTIMATE 0.24 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; WARING, 1965; TATLOCK, 1969;

TOPO MAPS: KYLE HOT SPRING 1:62,500; WINNEMUCCA 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

NA-K-CA THERMOMETRY MAY BE TOO HIGH

PREPARED BY: E. A. JOHNSON; J. RENNER

NAME: KYLE HOT SPRINGS ; NEVADA

242

INPUT RECORD # 197 MIRRORED ON 3/76
NAME: LEACH HOT SPRINGS, NEVADA RESOURCE CATEGORY: HOT WATER > 150 C
WARNING FIG: 8 NUMBER: 64 DATE: 01/75

LOCATION:

STATE: NEVADA COUNTY: PERSHING
LATITUDE: 40 36.22 TOWNSHIP: 32N
LONGITUDE: 117 38.74 RANGE: 38E
ELEV: 4661 SECTION: 36 SE1/4 1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONS: SINTER, HOT SPRING(S),

PHIC. ROCKS ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM; TERTIARY SEDIMENTARY ROCKS; BASALT (AGE?); PALEOZOIC METAMOR

SURFACE DISCHARGE TOTAL: 760.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: 9.00E+02 L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 8.00E+05 CAL/SEC
AREA OF SURFACE EX: 0.1 KM**2
APPROX. # OF HOT SPRINGS: SEVERAL HOT SPRINGS

TEMPERATURE: RANGE OF SPRING TEMP. 59 C TO 96 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03
92	0.0	7.40	135.00	160.00	13.00	8.80	53.0	29.0	366

OTHER CHEMICAL DATA SEE COMMENTS

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
147.3	154.9	128.9	175.8	138.9

RESERVOIR PROPERTIES

RANGE IN RES TEMP 150 C TO 180 C ASSUMED
BEST EST. AVER. TEMP 170.0
AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 4.0 KM**2
BASED ON GEOLOGY, TEMPERATURE GRADIENT
DEPTH TO TOP OF RES. 0.50 KM TO 1.50 KM; BEST ESTIMATE 0.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.50 TO 2.50 KM; BEST ESTIMATE 2.50 KM.
VOLUME 6.00 TO 10.00 KM**3; BEST ESTIMATE 10.00 KM**3
HEAT CONTENT > 15 C 0.49 TO 0.99 E18 CAL; BEST ESTIMATE 0.93 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; WARING, 1965; TATLOCK, 1969; OLMSTED AND OTHERS, 1975

TOPO MAPS: LEACH HOT SPRING 1:62,500, WINNEMUCCA 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

LOW CA & MG

PREPARED BY: E. A. JOHNSON, J. RENNERT

NAME: LEACH HOT SPRINGS, NEVADA

243

INPUT RECORD # 198 MIRRORED ON 3/76
NAME: UNNAMED HOT SPRINGS (HOT SPRINGS RANCH) , NEVADA RESOURCE CATEGORY: HOT WATER > 150 C
WAKING FIG: 8 NUMBER: 196? DATE: 01/75

LOCATION:

STATE: NEVADA COUNTY: HUMBOLDT
LATITUDE: 40 45.69 TOWNSHIP: 33N
LONGITUDE: 117 29.54 RANGE: 40E
ELEV: 4840 SECTION: 5 , SE1/4 1/4 B&M: MT. DIAULO
SURFACE MANIFESTATIONS: TRAVERTINE.

ROCK AND STRUCTURE TYPE: CAMBRIAN PHYLLITIC SHALE
SURFACE DISCHARGE TOTAL: 100.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: SEVERAL

TEMPERATURE: RANGE OF SPRING TEMP. 85 C TO

MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
85	0.0	8.40	125.00	200.00	18.00	16.00	140.0	41.0	385

OTHER CHEMICAL DATA SEE COMMENTS

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
143.5	150.3	123.7	179.9	139.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 145 C TO 190 C ASSUMED

BEST EST. AVER. TEMP 180.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.08 TO 0.42 E18 CAL; BEST ESTIMATE 0.22 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; WARING, 1965; WILDEN 1964;

TOPO MAPS: EDNA MTN. 1:62,500; WINNEMUCCA 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

CALCITE PPT (MIXED?); NA-K-CA MAY BE INACCURATE

PREPARED BY: E. A. JOHNSON, J. RENNER

NAME: UNNAMED HOT SPRINGS (HOT SPRINGS RANCH) , NEVADA

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INPUT RECORD # 199 MIRRORED ON 3/76
NAME: UNNAMED HOT SPRING (JERSEY VALLEY) ,NEVADA RESOURCE CATAGORY: HOT WATER > 150 C
WARNING FIG: NUMBER: DATE: 01/75

LOCATION:
STATE: NEVADA COUNTY: PERSHING
LATITUDE: 40 10.74 TOWNSHIP: 27N
LONGITUDE: 117 29.40 RANGE: 40E
ELEV: 4520 SECTION: 28 SW1/4 1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONS: SINTER, TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM; TERTIARY TUFFS & FLOWS
SURFACE DISCHARGE TOTAL: 20.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 1?

TEMPERATURE: RANGE OF SPRING TEMP. 29 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER AND OTHERS, 1974
SPRING FLOW
TEMP L/MIN PH SI02 NA K CA SO4 CL MC03
29 0.0 7.10 110.00 180.00 20.00 36.00 150.0 40.0 374

OTHER CHEMICAL DATA SEE COMMENTS
SI02 ADIABATIC SI02 CONDUCTIVE SI02 CHALCEDONY NA_K_CA OTHER
137.2 142.9 115.2 182.1 4/3 118.9

RESERVOIR PROPERTIES
RANGE IN RES TEMP 135 C TO 190 C ASSUMED
BEST EST. AVER. TEMP 185.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.07 TO 0.42 E18 CAL; BEST ESTIMATE 0.23 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

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GEOPHYSICAL SURVEYS:
DEVELOPMENTS:
REFERENCES: MARINER AND OTHERS, 1974; TATLOCK, 1969

TOPO MAPS: MT MOSES 1:62,500; WINNEMUCCA 1:250,000

SPRING IDENTIFIED: YES
COMMENTS:

LOW FLOW RATE; QUALITATIVELY HIGH AQUIFER TEMPERATURE; SINTER REPORTED; LOW SURFACE TEMP BECAUSE OF LOW DISCHARGE.

PREP, RED BY: E. A. JOHNSON, J. RENNER

NAME: UNNAMED HOT SPRING (JERSEY VALLEY) , NEVADA

INPUT RECORD # 200 MIRRORED ON 3/76
NAME: FLOWING WELL IN STILLWATER, NEVADA RESOURCE CATEGORY: HOT WATER > 150 C
WARING FIG: NUMBER: DATE: 01/75

LOCATION:
STATE: NEVADA COUNTY: CHURCHILL
LATITUDE: 39 31.29 TOWNSHIP: 19N
LONGITUDE: 118 33.13 RANGE: 31E
ELEV: 3900 SECTION: 7 SW1/4 1/4 BGM: MT. DIABLO
SURFACE MANIFESTATIONS: FOUND BY DRILLING

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM; TERTIARY BASALT

SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: 0.00E+03 L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 1.50E+07 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 0 (WELL)

TEMPERATURE: RANGE OF SPRING TEMP. 96 C TO

MAX. WELL TEMP 115 C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW

TEMP	L/MIN	PH	SiO2	NA	K	CA	SO4	CL	HCO3
96	0.0	7.57	170.00	1480.00	42.00	108.00	190.0	2200.0	90

OTHER CHEMICAL DATA SEE COMMENTS

SiO2	SiO2	SiO2	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY		
159.3	169.3	145.5	1/3 140.2	4/3 150.1

RESERVOIR PROPERTIES

RANGE IN RES TEMP 145 C TO 175

BEST EST. AVER. TEMP 160.0

AREA 4.0 TO 20.0 KM**2; BEST ESTIMATE 10.0 KM**2

BASED ON GEOLOGY; TEMP GRADIENT

DEPTH TO TOP OF RES. 0.50 KM TO 1.50 KM; BEST ESTIMATE 0.50 KM

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM

THICKNESS 1.50 TO 2.50 KM; BEST ESTIMATE 2.50 KM

VOLUME 6.00 TO 50.00 KM**3; BEST ESTIMATE 25.00 KM**3

HEAT CONTENT > 15 C 0.47 TO 4.80 E18 CAL; BEST ESTIMATE 2.20 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO DARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; WILDEN AND SPEED, 1968; MORRISON, 1964; OLMSTED AND OTHERS, 1975

TOPO MAPS: STILLWATER 1:62,500; RENO 1:250,000

SPRING IDENTIFIED: NO

COMMENTS:

HIGH CHLORIDE; BOILING; A 82M WELL FLOWS AT 88C. ANALYSIS AND SPRING TEMP REPORTED ACTUALLY FROM FLOWING WELL.
HOT WELLS TO AT LEAST 115C.

PREPARED BY: E. A. JOHNSON, J. RENNER

NAME: FLOWING WELL IN STILLWATER, NEVADA

246

INPL. RECORD # 201 MIRRORED ON 3/76
NAME: SODA LAKE, NEVADA RESOURCE CATEGORY: HOT WATER > 150 C
WARNING FIG: NUMBER: DATE: 02/75

LOCATION:

STATE: NEVADA COUNTY: CHURCHILL
LATITUDE: 39 34.00 TOWNSHIP: 20N
LONGITUDE: 118 49.00 RANGE: 28E
ELEV: 3940 SECTION: 28 . 1/4 1/4 B&M: M.D.M.
SURFACE MANIFESTATIONS: FUMAROLE OR WARM VAPOR,

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM BETWEEN TWO CENTERS OF QUATERNARY BASALTIC ERUPTIONS

SURFACE DISCHARGE TOTAL: L/MIN

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 3.50E+06 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP.

MAX. WELL TEMP 90 C AT 1 M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/74 SOURCE: MARINER AND OTHERS, 1975

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
90	0.0	7.90	160.00	1000.00	48.00	82.00	360.0	1500.0	138

OTHER CHEMICAL DATA B 5.7, LI 1.4

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY		
156.1	165.5	141.0	1/3 161.0	4/3 159.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 120 C TO 165 C ASSUMED

BEST EST. AVER. TEMP 165.0

AREA 2.0 TO 10.0 KM**2; BEST ESTIMATE 5.0 KM**2

BASED ON GEOLOGY, TEMP GRADIENT

DEPTH TO TOP OF RES. 0.50 KM TO 1.50 KM; BEST ESTIMATE 0.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.50 TO 2.50 KM; BEST ESTIMATE 2.50 KM.

VOLUME 3.00 TO 25.00 KM**3; BEST ESTIMATE 12.50 KM**3

HEAT CONTENT > 15 C 0.19 TO 2.30 E18 CAL; BEST ESTIMATE 1.10 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: OLMSTED AND OTHERS, 1975; MARINER AND OTHERS, 1975

TOPO MAPS: SODA LAKE 1:62,500

SPRING IDENTIFIED: NO

COMMENTS:

SMALL AREA ALTERED BY GASES, 21KM**2 OF ANOMALOUS HEAT FLOW

PREPARED BY: E. A. JOHNSON, J. RENNER

NAME: SODA LAKE, NEVADA

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INPUT RECORD # 202 MIRRORED ON 3/76
NAME: BRADY, NEVADA RESOURCE CATEGORY: HOT WATER > 150 C
WARNING FIG: 8 NUMBER: 72 DATE: 01/75

LOCATION:

STATE: NEVADA COUNTY: CHURCHILL
LATITUDE: 39 47.21 TOWNSHIP: 22N
LONGITUDE: 119 0.00 RANGE: 26E
ELEV: 4120 SECTION: 12 SW1/4 1/4 H&M: MT. DIABLO
SURFACE MANIFESTATIONS: SINTER, HOT SPRING(S), FUMAROLE OR WARM VAPOR,

ROCK AND STRUCTURE TYPE: PLIOCENE-PLEISTOCENE BASALT; QUATERNARY ALLUVIUM

SURFACE DISCHARGE TOTAL: L/MIN

CALCULATED TOTAL DISCHARGE: 2.70E+03 L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 8.10E+00 CAL/SEC

AREA OF SURFACE EX: 0.6 KM**2

APPROX. # OF HOT SPRINGS: SEVERAL

TEMPERATURE: RANGE OF SPRING TEMP. 70 C TO 98 C OR

MAX. WELL TEMP 214 C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: OLMSTED AND OTHERS, 1975

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03
0	0.0	9.00	242.00	0.00	0.00	0.00	0.0	0.0	0

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
179.0	193.4	173.8	0.0	0.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 200 C TO 230 C ASSUMED

BEST EST. AVER. TEMP 214.0

AREA 5.0 TO 30.0 KM**2; BEST ESTIMATE 12.0 KM**2

BASED ON GEOLOGY, TEMP GRADIENT, EXPLORATION, SURFACE EXPRESSION

DEPTH TO TOP OF RES. 0.50 KM TO 1.50 KM; BEST ESTIMATE 0.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.50 TO 2.50 KM; BEST ESTIMATE 2.50 KM.

VOLUME 7.50 TO 75.00 KM**3; BEST ESTIMATE 30.00 KM**3

HEAT CONTENT > 15 C 0.83 TO 9.70 E18 CAL; BEST ESTIMATE 3.60 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING 1965; KOENIG 1970; OLMSTED AND OTHERS, 1975; GARSIDE, 1974

TOPO MAPS: FIRE BALL RIDGE 1:62,500; RENO 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

KOENIG SAYS RESERVOIR BASE TEMP IS PROBABLY ABOVE 205C & FLOW TEMP COMMONLY EXCEEDS 150C; 5% STEAM FLASHOVER;
SEVERAL FORMER SPRINGS DISCHARGED 200 LPM FROM AREA OF SINTER

PREPARED BY: E. A. JOHNSON, J. RENNER

NAME: BRADY, NEVADA

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INPUT RECORD # 203 MIRRORED ON 3/76
NAME: STEAMBOAT SPRINGS, NEVADA RESOURCE CATEGORY: HOT WATER > 150 C
WADING FIG: 8 NUMBER: 56, 55 E.F DATE: 12/74

LOCATION:

STATE: NEVADA COUNTY: WASHOE
LATITUDE: 39 23.00 TOWNSHIP: 18N
LONGITUDE: 119 45.00 RANGE: 20E
ELEV: 4660 SECTION: 33, NW1/4 1/4 H&M: M.O.M.
SURFACE MANIFESTATIONS: SINTER, HOT SPRING(S), GEYSER(S), FUMAROLE OR WARM VAPOR.

ROCK AND STRUCTURE TYPE: PLIOCENE - PLEISTOCENE VOLCANICS ON PRE-TERTIARY GRANITIC AND METAMORPHIC "BASEMENT"

NT**

SURFACE DISCHARGE TOTAL: 250.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: 4.30E+03 L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 1.20E+01 CAL/SEC
AREA OF SURFACE EX: 5.7 KM**2
APPROX. # OF HOT SPRINGS: 74

TEMPERATURE: RANGE OF SPRING TEMP. 45 C TO 96 C OR
MAX. WELL TEMP 186 C AT 221 M DEPTH BOTTOM HOLE TEMP. 186 C AT 221 M DEPTH
CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: WHITE AND OTHERS, 1963

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HCO3
89	0.0	7.90	293.00	653.00	71.00	5.00	100.0	865.0	305

OTHER CHEMICAL DATA ISOTOPES, MINOR ELEMENTS

SI02	SI02	SI02	NA_K_CA	OTHER	
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3	NA-K
190.4	207.5	190.8	226.2	296.1	196

RESERVOIR PROPERTIES

RANGE IN RES TEMP 170 C TO 220 C ASSUMED
BEST EST. AVER. TEMP 210.0
AREA 5.0 TO 10.0 KM**2; BEST ESTIMATE 6.0 KM**2
BASED ON SURFACE EXPRESSION
DEPTH TO TOP OF RES. 0.05 KM TO 0.30 KM; BEST ESTIMATE 0.30 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 2.90 TO 2.50 KM; BEST ESTIMATE 2.70 KM.
VOLUME 12.50 TO 29.00 KM**3; BEST ESTIMATE 16.00 KM**3
HEAT CONTENT > 15 C 1.20 TO 3.60 E18 CAL; BEST ESTIMATE 1.90 E18 CAL
POROSITY 0.01 TO 0.05 BEST ESTIMATE 0.02
PERMEABILITY TO DARCY:
AVERAGE WELL FLOW 10 TO 50 KG/HR; WELL DIAMETER 15.00 CM

GEOPHYSICAL SURVEYS: GRAVITY, MAG, DC RESISTIVITY

DEVELOPMENTS: ABOUT 35 WELLS DRILLED, MOSTLY FOR SPA SUPPLY; ABOUT 10 FOR GEOTHERMAL RESEARCH AND EXPLO
REFERENCES: THOMPSON AND WHITE, 1964; VARING, 1965; WHITE AND OTHERS, 1964; WHITE AND OTHERS, 1963; WHITE, 1968

TOPO MAPS: MT. ROSE AND VIRGINIA CITY 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

ANALYSIS, SPRING #8, WHITE AND OTHERS, 1963, P. F40; EXTENSIVE SINTER DEPOSITS, AGES AT LEAST 1 MILLION YEARS OL
0

PREPARED BY: D. E. WHITE

NAME: STEAMBOAT SPRINGS, NEVADA

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INPUT RECORD # 204 MIRRORED ON 3/76
NAME: WABUSKA HOT SPRINGS, NEVADA RESOURCE CATEGORY: HOT WATER > 150 C
WARING FIG: 8 NUMBER: 62 DATE: 01/75

LOCATION:

STATE: NEVADA COUNTY: LYON
LATITUDE: 39 9.69 TOWNSHIP: 15N
LONGITUDE: 119 10.96 RANGE: 25E
ELEV: 4300 SECTION: 16, SE 1/4 1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S),

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM; MIOCENE-PLEISTOCENE BASALT & ANDESITE; TRIASSIC & JURASSIC META VOLCANICS

SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: SEVERAL

TEMPERATURE: RANGE OF SPRING TEMP. 59 C TO 97 C OR
MAX. WELL TEMP 106 C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW		OTHER CHEMICAL DATA							
TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
97	0.0	8.50	115.00	277.00	15.00	38.00	580.0	46.0	70

OTHER CHEMICAL DATA SEE COMMENTS

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
139.4	145.5	118.1	152.3	111.8

RESERVOIR PROPERTIES

RANGE IN RES TEMP 135 C TO 160 C ASSUMED
BEST EST. AVER. TEMP 155.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.07 TO 0.35 E18 CAL; BEST ESTIMATE 0.19 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MOARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER, AND OTHERS, 1974; MOORE, 1969; WARING, 1965

TOPO MAPS: WABUSKA 1:62,500; TONOPAH 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

MAY BE LARGER

PREPARED BY: E. A. JOHNSON, J. RENNER

NAME: WABUSKA HOT SPRINGS, NEVADA

INPUT RECORD # 205 MIRRORED ON 3/76
NAME: LEE HOT SPRINGS, NEVADA RESOURCE CATEGORY: HOT WATER > 150 C
WARING FIG: 8 NUMBER: 74A DATE: 01/75

LOCATION:
STATE: NEVADA COUNTY: CHURCHILL
LATITUDE: 39 12.55 TOWNSHIP: 16N
LONGITUDE: 118 43.39 RANGE: 29E
ELEV: 4020 SECTION: 34 NW1/4 NE1/4 H&M:
SURFACE MANIFESTATIONS: SINTER, TRAVERTINE.

ROCK AND STRUCTURE TYPE: MIOCENE-PLIOCENE VOLCANIC ROCKS
SURFACE DISCHARGE TOTAL: 130.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: SEVERAL
TEMPERATURE: RANGE OF SPRING TEMP. 88 C TO 78 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH
CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE:

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
88	0.0	7.40	180.00	450.00	26.00	44.00	470.0	380.0	114

OTHER CHEMICAL DATA SEE COMMENTS

SI02	SI02	SI02	NA_K_CA	OTHER
162.4	CONDUCTIVE	CHALCEDONY	1/3	
	173.1	149.8	4/3	
			162.1	137.3

RESERVOIR PROPERTIES

RANGE IN RES TEMP 150 C TO 180 C ASSUMED
BEST EST. AVER. TEMP 175.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.08 TO 0.40 E18 CAL; BEST ESTIMATE 0.21 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; WARING, 1965; WILDEN AND SPEED, 1968

TOPO MAPS: ALLEN SP. 1:62,500; RENO, 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

PREPARED BY: E. A. JOHNSON, J. RENNER

NAME: LEE HOT SPRINGS, NEVADA

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INPUT RECORD # 206 MIRRORED ON 3/76
NAME: UNNAMED HOT SPRINGS (SMITH CREEK VALLEY), NEVADA RESOURCE CATEGORY: HOT WATER > 150 C
WARNING: FIG: 78 NUMBER: 84? DATE: 01/75
LOCATION: TIME: 11: 22:00

STATE: NEVADA COUNTY: LANDER

LATITUDE: 39 21.35 TOWNSHIP: 17N

LONGITUDE: 117 32.80 RANGE: 39E

ELEV: 5100 SECTION: 11, 1/4 1/4 8&M: MT. DIABLO

SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S)

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM; TERTIARY (OLIGOCENE-MIOCENE) ASH-FLOW RHYOLITE

SURFACE DISCHARGE TOTAL: 75.0 L/MIN

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: SEVERAL

TEMPERATURE: RANGE OF SPRING TEMP. 86 C TO

MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HCO3
86	0.0	7.72	110.00	170.00	8.40	4.80	102.0	22.0	246

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY		
137.2	142.9	115.2	1/3	4/3
			156.6	138.4

RESERVOIR PROPERTIES

RANGE IN RES TEMP 135 C TO 165 C ASSUMED

BEST EST. AVER. TEMP: 160.0

AREA: 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES: 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES: 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS: 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME: 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.07 TO 0.36 E18 CAL; BEST ESTIMATE 0.20 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER; CM; 1000

GEOPHYSICAL SURVEYS:

DEVELOPMENTS: MILLET 1:250,000

REFERENCES: MARINER, AND OTHERS, 1974; WARING, 1965; MCKEE, 1968

TOPOG MAPS: MILLET 1:250,000

SPRING IDENTIFIED:NO

COMMENTS:

PREPARED BY: E. A. JOHNSON, J. RENNER

NAME: UNNAMED HOT SPRINGS (SMITH CREEK VALLEY), NEVADA

252

INPUT RECORD # 207 MIRRORED ON 3/76
NAME: BOG HOT SPRINGS, NEVADA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARING FIG: # NUMBER: 2 DATE: 01/75
LOCATION:

STATE: NEVADA COUNTY: HUMBOLDT
LATITUDE: 41 55.51 TOWNSHIP: 46N
LONGITUDE: 118 48.13 RANGE: 28E
ELEV: 4300 SECTION: 18, NW1/4 1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM; PLEISTOCENE VOLCANIC & SEDIMENTARY ROCKS
SURFACE DISCHARGE TOTAL: 4000.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 2

TEMPERATURE: RANGE OF SPRING TEMP. 54 C TO 88 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/73 SOURCE: MARINER AND OTHERS, 1974

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
54	0.0	9.05	57.00	81.00	1.00	0.20	45.0	15.0	116

OTHER CHEMICAL DATA SEE COMMENTS

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY		
107.9	108.5	77.0	1/3 108.9	4/3 127.2

RESERVOIR PROPERTIES

RANGE IN RES TEMP 95 C TO 120 C ASSUMED
BEST EST. AVER. TEMP 115.0
AREA 1.0 TO 3.0 KM**2; BEST ESTIMATE 2.0 KM**2
BASED ON
DEPTH TO TOP OF RES. 0.50 KM TO 1.50 KM; BEST ESTIMATE 1.00 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.50 TO 2.50 KM; BEST ESTIMATE 2.00 KM.
VOLUME 1.50 TO 7.50 KM**3; BEST ESTIMATE 4.00 KM**3
HEAT CONTENT > 15 C 0.07 TO 0.47 E18 CAL; BEST ESTIMATE 0.24 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS: MARINER AND OTHERS, 1974; WARING, 1965; WILDEN, 1964

REFERENCES:

TOPO MAPS: RAILROAD POINT 1:62,500; VYA 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

LOW TDS. DEEP CIRCULATION METEORITIC OR MIXED (?)

PREPARED BY: E. A. JOHNSON, J. RENNER

NAME: BOG HOT SPRINGS, NEVADA

253

INPUT RECORD # 208 MIRRORED ON 376
NAME: HOWARD HOT SPRINGS NEVADA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 8 NUMBER: 10 DATE: 01/75

LOCATION:
STATE: NEVADA COUNTY: HUMBOLDT
LATITUDE: 41 43.27 TOWNSHIP: 44N
LONGITUDE: 118 30.26 RANGE: 31E
ELEV: 4320 SECTION: 4 NE1/4 1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM; TERTIARY VOLCANIC FLOWS

SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: SEVERAL

TEMPERATURE: RANGE OF SPRING TEMP. 56 C TO

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 08/73 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HCO3
56	0.0	9.20	85.00	88.00	1.70	3.00	62.0	10.0	127

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY		
125.2	128.7	99.3	1/3 109.8	4/3 80.7

RESERVOIR PROPERTIES

RANGE IN RES TEMP 80 C TO 140 C ASSUMED

BEST EST. AVER. TEMP 130.0

AREA 1.0 TO 4.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM

VOLUME 1.00 TO 8.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.04 TO 0.60 E18 CAL; BEST ESTIMATE 0.15 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDAFCY

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; WARING, 1969; WILDEN, 1964; SMITH, 1973

TOPO MAPS: DUFFOR PEAK 1:62,500 & VYA 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

NA-K-4/3 CA ESTIMATE NEAR SP. TEMP.

PREPARED BY: E. A. JOHNSON & J. RENNERT

NAME: HOWARD HOT SPRINGS NEVADA

254

INPUT RECORD # 209 MIRRORED ON 3/76
NAME: DYKE HOT SPRINGS, NEVADA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WAKING FIG: NUMBER: DATE: 01/75
LOCATION:

STATE: NEVADA COUNTY: HUMBOLDT
LATITUDE: 41 34.01 TOWNSHIP: 43N
LONGITUDE: 118 33.74 RANGE: 30E
ELEV: 4120 SECTION: 25, SE1/4 SE1/4 0&M: MT. DIABLO
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM; TRIASSIC & JURASSIC METAMORPHIC ROCKS
SURFACE DISCHARGE TOTAL: 100.0 L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 1?

TEMPERATURE: RANGE OF SPRING TEMP. 66 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/73 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03
66	0.0	8.90	85.00	150.00	4.30	1.80	82.0	21.0	243

OTHER CHEMICAL DATA SEE COMMENTS

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
125.2	128.7	99.3	137.0	135.8

RESERVOIR PROPERTIES

RANGE IN RES TEMP 120 C TO 150
BEST EST. AVER. TEMP 140.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.06 TO 0.32 E18 CAL; BEST ESTIMATE 0.17 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; WILDEN, 1964; SMITH, 1973.

TOPO MAPS: DUFFOR PEAK 1:62,500, VYA 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

LOW CA & MG, SP NEAR BOILING

PREPARED BY: E. A. JOHNSON, J. RENNER

NAME: DYKE HOT SPRINGS, NEVADA

255

INPUT RECORD # 210 MIRRORED ON 3/76
NAME: UNNAMED HOT SPRINGS NEAR SOLDIERS MEADOW, NEVADA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARING FIG: 8 NUMBER: 8 DATE: 01/75

LOCATION:

STATE: NEVADA COUNTY: HUMBOLDT
LATITUDE: 41 21.48 TOWNSHIP: 40N
LONGITUDE: 119 13.21 RANGE: 24E
ELEV: 4600 SECTION: 23 1/4 1/4 B&M: MT. DIABLO

SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM; TERTIARY FLOWS & TUFFS

SURFACE DISCHARGE TOTAL: 50.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 6.0 KM**2

APPROX. # OF HOT SPRINGS: SEVERAL SPRINGS

TEMPERATURE: RANGE OF SPRING TEMP. 54 C TO

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/73 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
54	0.0	8.60	63.00	74.00	1.10	3.10	41.0	18.0	92

OTHER CHEMICAL DATA SEE COMMENTS

SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	
112.1	113.4	82.3	
		1/3	4/3
		97.6	64.5

RESERVOIR PROPERTIES

RANGE IN RES TEMP 60 C TO 120 C ASSUMED

BEST EST. AVER. TEMP 115.0

AREA 4.0 TO 12.0 KM**2; BEST ESTIMATE 6.0 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.50 KM TO 1.50 KM; BEST ESTIMATE 1.00 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.50 TO 2.50 KM; BEST ESTIMATE 2.00 KM.

VOLUME 6.00 TO 30.00 KM**3; BEST ESTIMATE 12.00 KM**3

HEAT CONTENT > 15 C 0.16 TO 1.90 E18 CAL; BEST ESTIMATE 0.72 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; WARING, 1965; WILDEN, 1964

TOPO MAPS: VYA 1:250,000

SPRING IDENTIFIED: NO

COMMENTS:

NA-K-4/3CA ESTIMATE NEAR SP. TEMP.

PREPARED BY: E. A. JOHNSON, J. RENNER

NAME: UNNAMED HOT SPRINGS NEAR SOLDIERS MEADOW, NEVADA

256

INPUT RECORD # 211 MIRRORED ON 3/76
NAME: DOUBLE HOT SPRING, NEVADA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARING FIG: 8 NUMBER: 12 DATE: 01/75

LOCATION:
STATE: NEVADA COUNTY: HUMBOLDT
LATITUDE: 41 2.97 TOWNSHIP: 36N
LONGITUDE: 119 2.81 RANGE: 26E
ELEV: 4000 SECTION: 4, 1/4 1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM; TERTIARY BASALT & ASH FLOW RHYOLITE
SURFACE DISCHARGE TOTAL: 175.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: SEVERAL SPRINGS

TEMPERATURE: RANGE OF SPRING TEMP. 80 C TO 57 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/74 SOURCE: MARINER AND OTHERS, 1974
SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
80	0.0	7.93	105.00	180.00	4.50	4.80	120.0	59.0	261

OTHER CHEMICAL DATA SEE COMMENTS

SI02	SI02	NA_K_CA	OTHER
ADIAHATIC	CONDUCTIVE	CHALCEDONY	
135.0	140.3	112.3	
		1/3	4/3
		126.7	113.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 110 C TO 150 C ASSUMED
BEST EST. AVER. TEMP 145.0
AREA 2.0 TO 30.0 KM**2; BEST ESTIMATE 10.0 KM**2
BASED ON
DEPTH TO TOP OF RES. 0.50 KM TO 2.00 KM; BEST ESTIMATE 1.00 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.50 KM; BEST ESTIMATE 2.00 KM.
VOLUME 2.00 TO 75.00 KM**3; BEST ESTIMATE 20.00 KM**3
HEAT CONTENT > 15 C 0.11 TO 6.10 E18 CAL; BEST ESTIMATE 1.60 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

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GEOPHYSICAL SURVEYS:
DEVELOPMENTS:
REFERENCES: MARINER AND OTHERS, 1974; WARING, 1965; WILDEN, 1964; OLMSTED AND OTHERS, 1975; MOSE AND TAYLOR, 1974

TOPO MAPS: VYA 1:250,000

SPRING IDENTIFIED: NO
COMMENTS:

LOW CA, BICARBONATE & MG (MIXED). AREA OF HOT WATER ALONG POSSIBLE FAULT 9 KM. TO NORTH OF SPRINGS. AREA INCLUDES ZONE FROM DOUBLE TO BLACK ROCK POINT

PREPARED BY: E. A. JOHNSON, J. RENNER

NAME: DOUBLE HOT SPRING, NEVADA

INPUT RECORD #: 212 MIRRORED ON 3/76.

NAME: UNNAMED HOT SPRINGS NEAR BLACK ROCK PT., NEVADA RESOURCE CATEGORY: HOT WATER 90 TO 150 C

WARNING FIG: 8 NUMBER: 16

DATE: 01/75

LOCATION:

STATE: NEVADA COUNTY: PERSHING
LATITUDE: 40 57.00 TOWNSHIP: 36N
LONGITUDE: 118 58.00 RANGE: 26E
ELEV: 4000 SECTION: 34 1/4 1/4 86M

SURFACE MANIFESTATIONS: HOT SPRING(S)

ROCK AND STRUCTURE TYPE: QUATERNARY PLAYA SEDI. TERTIARY VOL. & SEDI ROCKS

SURFACE DISCHARGE TOTAL: L/MIN

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP: 90 C OR

MAX. WELL TEMP: C AT M DEPTH

BOTTOM HOLE TEMP: C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE: 00/73 SOURCE: MARINER AND OTHERS, 1973

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
90	0.0	8.10	120.00	1500.00	20.00	35.00	290.0	787.0	932

OTHER CHEMICAL DATA SEE COMMENTS

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY		
141.5	147.9	120.9	173 116.3	473 150.7

RESERVOIR PROPERTIES:

RANGE IN RES TEMP: 0 C TO 0 C ASSUMED

BEST EST. AVER. TEMP: 150.0

AREA: 0.0 TO 0.0 KM**2; BEST ESTIMATE: 115 KM**2

BASED ON

DEPTH TO TOP OF RES: 0.00 KM TO 0.00 KM; BEST ESTIMATE: 1.50 KM

DEPTH TO BOTTOM OF RES: 0.00 KM TO 3.00 KM; BEST ESTIMATE: 3.00 KM

THICKNESS: 0.00 TO 0.00 KM; BEST ESTIMATE: 1.50 KM

VOLUME: 0.00 TO 0.00 KM**3; BEST ESTIMATE: 2.25 KM**3

HEAT CONTENT: > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE: 0.18 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MARGY

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; WARING, 1985; TATLOCK, 1969; OLMSTED AND OTHERS, 1975

TOPOMAP: LOVELOCK 1:250,000

SPRING IDENTIFIED: NO

COMMENTS:

HIGH CHLORIDE; NEAR BOILING; FLOW RATE (?); MAY BE CONTAMINATED BY SALINE WATER.

PREPARED BY: ELA JOHNSON, J. RENNER

NAME: UNNAMED HOT SPRINGS NEAR BLACK ROCK PT., NEVADA

258

INPUT RECORD # 213 MIRRORED ON 3/76
NAME: FLY RANCH (WARDS) ,NEVADA RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 8 NUMBER: 37 DATE: 01/75

LOCATION:

STATE: NEVADA COUNTY: WASHOE
LATITUDE: 40 52.03 TOWNSHIP: 34N
LONGITUDE: 119 20.93 RANGE: 23E
ELEV: 4050 SECTION: 1 1/4 1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM; UPPER TERTIARY BASALT, TUFFS & SEDIMENTARY ROCKS

SURFACE DISCHARGE TOTAL: 500.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.3 KM**2

APPROX. # OF HOT SPRINGS: SEVERAL

TEMPERATURE: RANGE OF SPRING TEMP. 80 C TO 57 C OR

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/73 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
80	0.0	7.91	82.00	340.00	17.00	31.00	46.0	240.0	458

OTHER CHEMICAL DATA SEE COMMENTS

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
123.6	126.8	97.2	153.4	125.1

RESERVOIR PROPERTIES

RANGE IN RES TEMP 110 C TO 155 C ASSUMED

BEST EST. AVER. TEMP 130.0

AREA 1.0 TO 10.0 KM**2; BEST ESTIMATE 8.0 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.50 KM TO 2.00 KM; BEST ESTIMATE 1.00 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.50 KM; BEST ESTIMATE 2.00 KM.

VOLUME 1.00 TO 25.00 KM**3; BEST ESTIMATE 16.00 KM**3

HEAT CONTENT > 15 C 0.06 TO 2.10 E18 CAL; BEST ESTIMATE 1.10 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO DARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; WARING, 1965; BONHAM, 1969; OLMSTED AND OTHERS, 1975; MOSE AND TAYLOR, 1974

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TOPO MAPS: LOVELOCK 1:250,000

SPRING IDENTIFIED: NO

COMMENTS:

CALCITE PPT.; NA-K-CA ESTIMATES MAY BE TOO HIGH;

PREPARED BY: E. A. JOHNSON, J. RENNER

NAME: FLY RANCH (WARDS) , NEVADA

259

INPUT RECORD # 214 MIRRORED ON 3/76
NAME: BUTTE SPRINGS (TREGO) NEVADA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 8 NUMBER: 63? DATE: 01/75
LOCATION:

STATE: NEVADA COUNTY: PERSHING
LATITUDE: 40 46.00 TOWNSHIP: 34N
LONGITUDE: 119 7.00 RANGE: 26E
ELEV: 4000 SECTION: 31 .NE1/4 1/4 H&M
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: QUATERNARY DUNE SAND; CRETACEOUS GRANITE

SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS:
TEMPERATURE: RANGE OF SPRING TEMP. 86 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH
CHEMICAL DATA ANALYSIS DATE 00/73 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW
TEMP L/MIN PH SIO2 NA K CA SO4 CL HCO3
86 0.0 8.40 85.00 463.00 9.30 25.00 86.0 520.0 154

OTHER CHEMICAL DATA SEE COMMENTS

SIO2	SIO2	SIO2	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
125.2	128.7	99.3	119.3	110.7

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 135 C ASSUMED
BEST EST. AVER. TEMP 130.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.05 TO 0.29 E18 CAL; BEST ESTIMATE 0.15 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY:
AVERAGE WELL FLOW TO KG/HRI WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; WARING 1965; TATLOCK, 1969; OLMSTED AND OTHERS, 1975

TOPO MAPS: LOVELOCK 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

HIGH CHLORIDE; NEAR BOILING; FLOW RATE (?)

PREPARED BY: E. A. JOHNSON; J. RENNER

NAME: BUTTE SPRINGS (TREGO) , NEVADA

260

INPUT RECORD # 215 MIRRORED ON 3/76
NAME: MINERAL (SAN JACINTO) HOT SPRINGS, NEVADA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 8 NUMBER: 228 DATE: 01/75

LOCATION:

STATE: NEVADA COUNTY: ELKO
LATITUDE: 41 47.27 TOWNSHIP: 45N
LONGITUDE: 114 43.31 RANGE: 64E
ELEV: 5300 SECTION: 16 . 1/4 1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: TERTIARY LACUSTRINE SEDIMENTS, GRANITE(?), & VOLCANIC FLOWS

SURFACE DISCHARGE TOTAL: 4500.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: "SEVERAL" SPRINGS & SHALLOW WELLS

TEMPERATURE: RANGE OF SPRING TEMP. 60 C TO 25 C OR

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/73 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
60	0.0	9.10	83.00	75.00	2.20	1.60	45.0	15.0	108

OTHER CHEMICAL DATA SEE COMMENTS

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
124.1	127.5	97.9	128.8	102.5

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 135 C ASSUMED

BEST EST. AVER. TEMP 130.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.06 TO 0.29 E18 CAL; BEST ESTIMATE 0.16 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO DARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; WARING, 1965; GRANGER AND OTHERS, 1957

TOPO MAPS: DELAPLAIN 1:62,500, WELLS 1:250,000

SPRING IDENTIFIED: NO

COMMENTS:

LOW CA, MG, CL (?) - MODERATE SILICA

PREPARED BY: E. A. JOHNSON, J. RENNER

NAME: MINERAL (SAN JACINTO) HOT SPRINGS, NEVADA

261

INPUT RECORD # 216, MIRRORED ON 3/76
NAME: HOT HOLE (ELKO HOT SPRINGS), NEVADA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 8 NUMBER: 32 DATE: 01/75

LOCATION:

STATE: NEVADA COUNTY: ELKO
LATITUDE: 40 49:11 TOWNSHIP: 34N
LONGITUDE: 115 46:53 RANGE: 55E
ELEV: 5060 SECTION: 21 NE1/4 1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: TERTIARY LIMESTONE, LACUSTRINE ROCK & VOLCANIC ROCKS

SURFACE DISCHARGE TOTAL: 75.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: SEVERAL

TEMPERATURE: RANGE OF SPRING TEMP: 56 C TO 89 C OR

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP: C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/73 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW

TEMP L/MIN PH

SI02

NA

K

CA

SO4

CL

HCO3

OTHER CHEMICAL DATA SEE COMMENTS

SI02

SI02

SI02

NA_K_CA

OTHER

113.4

114.9

84.0

1/3
234.0

4/3
126.9

RESERVOIR PROPERTIES

RANGE IN RES TEMP: 100 C TO 235 C ASSUMED

BEST EST. AVER. TEMP: 115.0

AREA: 1.0 TO 2.5 KM**2; BEST ESTIMATE 2.0 KM**2

BASED ON

DEPTH TO TOP OF RES: 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM

DEPTH TO BOTTOM OF RES: 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM

THICKNESS: 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM

VOLUME: 1.00 TO 5.00 KM**3; BEST ESTIMATE 3.00 KM**3

HEAT CONTENT > 15 C: 0.06 TO 0.67 E18 CAL; BEST ESTIMATE 0.20 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO DARCY

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

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GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; WARING, 1965; GRANGER AND OTHERS, 1957;

TOPO MAPS: ELKO WEST 1:24,000, ELKO 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

CALCITE PPT.: NA-K-CA UNRELIABLE

PREPARED BY: E. A. JOHNSON, J. RENNER

NAME: HOT HOLE (ELKO HOT SPRINGS), NEVADA

INPUT RECORD # 217, MIRRORED ON 3/76
NAME: UNNAMED HOT SPRINGS NEAR CARLIN, NEVADA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WATERING FIG. NUMBER: DATE: 01/75

LOCATION:
STATE: NEVADA COUNTY: ELKO
LATITUDE: 40 41.97 TOWNSHIP: 33N
LONGITUDE: 116 7.96 RANGE: 52E
ELEV: 4920 SECTION: 33, 1/4 1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM; TERTIARY VOLCANIC ROCKS
SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP. 79 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/73 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
79	0.0	7.60	70.00	45.00	16.00	60.00	52.0	12.0	335

OTHER CHEMICAL DATA SEE COMMENTS

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
116.6	118.6	88.1	218.4	81.4

RESERVOIR PROPERTIES

RANGE IN RES TEMP 80 C TO 125 C ASSUMED

BEST EST. AVER. TEMP 120.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.04 TO 0.26 E18 CAL; BEST ESTIMATE 0.14 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; GRANGER AND OTHERS, 1957; SMITH & KETNER, 1972

TOPO MAPS: CARLIN 1:62,500; WINNEMUCCA 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

NA-K-4/3CA TEMP NEAR THE SPRINGS TEMP

PREPARED BY: E. A. JOHNSON, J. RENNER

NAME: UNNAMED HOT SPRINGS NEAR CARLIN, NEVADA

263

INPUT RECORD # 218 MIRRORED ON 3/76
NAME: HOT SULPHUR (SULPHUR) SPRINGS, NEVADA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 8 NUMBER: 30 DATE: 01/75

LOCATION:

STATE: NEVADA COUNTY: ELKO
LATITUDE: 41 9.40 TOWNSHIP: 38N
LONGITUDE: 114 59.10 RANGE: 62E
ELEV: 5720 SECTION: 20 SE1/4 SE1/4 H&M: MT. DIABLO
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: TERTIARY VOLCANIC ROCKS; PALEOZOIC LIMESTONE

SURFACE DISCHARGE TOTAL: 190.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 3

TEMPERATURE: RANGE OF SPRING TEMP. 90 C TO 37 C OR

MAX. WELL TEMP. C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/73 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
90	0.0	7.00	84.00	390.00	41.00	49.00	18.0	40.0	1180

OTHER CHEMICAL DATA SEE COMMENTS

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
124.7	128.1	98.6	190.5	152.8

RESERVOIR PROPERTIES

RANGE IN RES TEMP 120 C TO 200 C ASSUMED

BEST EST. AVER. TEMP 140.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM,

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM,

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM,

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.06 TO 0.44 E18 CAL; BEST ESTIMATE 0.17 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; WARING, 1965; GRANGER AND OTHERS, 1957

TOPO MAPS: OXLEY PEAK 1:24,000, WELLS 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

HIGH CA & BICARBONATE, LOW CL. MIXED (?) NO DEPOSITION, PALEOZOIC LIMESTONES PRESENT IN SUBSURFACE.

PREPARED BY: E. A. JOHNSON, J. RENNER

NAME: HOT SULPHUR (SULPHUR) SPRINGS . NEVADA

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INPUT RECORD # 219 MIRRORED ON 3/76
NAME: HOT SPRINGS POINT, NEVADA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARING FIG: 8 NUMBER: 88A DATE: 01/75
LOCATION:

STATE: NEVADA COUNTY: EUREKA
LATITUDE: 40 24.21 TOWNSHIP: 29N
LONGITUDE: 116 31.00 RANGE: 48E
ELEV: 4750 SECTION: 11, NE1/4 1/4 86M: MT. DIABLO
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: UPPER MIOCENE & LOWER PLIOCENE BASALT; & ORDOVICIAN QUARTZITE AND CHERT

SURFACE DISCHARGE TOTAL: 125.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 2

TEMPERATURE: RANGE OF SPRING TEMP. 50 C TO 54 C OR

MAX. WELL TEMP 74 C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/73 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
54	0.0	6.63	67.00	230.00	58.00	53.00	7.0	1.0	913

OTHER CHEMICAL DATA SEE COMMENTS

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
114.7	116.4	85.7	232.9	158.6

RESERVOIR PROPERTIES

RANGE IN RES TEMP 110 C TO 235 C ASSUMED

BEST EST. AVER. TEMP 125.0

AREA 2.0 TO 10.0 KM**2; BEST ESTIMATE 5.0 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 2.00 TO 20.00 KM**3; BEST ESTIMATE 7.50 KM**3

HEAT CONTENT > 15 C 0.11 TO 2.60 E18 CAL; BEST ESTIMATE 0.49 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; WARING, 1965; GILLULY AND GATES, 1965; GARSIDE, 1974

TOPO MAPS: CRESCENT VA 1:62,500; WINNEMUCCA 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

HIGH CA; VERY LOW CHLORIDE, (MIXED WATER?)

PREPARED BY: E. A. JOHNSON, J. RENNER

NAME: HOT SPRINGS POINT, NEVADA

INPUT RECORD # 220 MIRRORED ON 3/76
NAME: WALTJ HOT SPRINGS, NEVADA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 01/75

LOCATION:

STATE: NEVADA COUNTY: EUREKA
LATITUDE: 39 54.08 TOWNSHIP: 24N
LONGITUDE: 116 35.22 RANGE: 48E
ELEV: 4680 SECTION: 33 SW1/4 1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S),

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM; UPPER MESOZOIC LOWER CENOZOIC GRANITE; PALEOZOIC SEDIMENTS

SURFACE DISCHARGE TOTAL: 300.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 6

TEMPERATURE: RANGE OF SPRING TEMP. 72 C TO

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/73 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HCO3
72	0.0	6.50	68.00	44.00	14.00	56.00	64.0	12.0	264

OTHER CHEMICAL DATA SEE COMMENTS

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY		
115.4	117.2	86.5	1/3 211.7	4/3 78.2

RESERVOIR PROPERTIES

RANGE IN RES TEMP 75 C TO 130 C ASSUMED

BEST EST. AVER. TEMP 120.0

AREA 1.0 TO 3.0 KM**2; BEST ESTIMATE 2.0 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM;

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM;

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM;

VOLUME 1.00 TO 6.00 KM**3; BEST ESTIMATE 3.00 KM**3

HEAT CONTENT > 15 C 0.04 TO 0.41 E18 CAL; BEST ESTIMATE 0.19 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDAFCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; ROBERTS AND OTHERS, 1967

TOPO MAPS: WALTJ H.S. 1:62,500; MILLET, 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

NA-K-4/JCA ESTIMATE NEAR SP. TEMP. SEVERAL HOT SPRINGS GROUPS PRESENT, 5 KM WEST IN MIDDLE OF VALLEY AND 9.5 KM NW TOWARD HOT SPRINGS POINT.

PREPARED BY: E. A. JOHNSON, J. RENNERT

NAME: WALTJ HOT SPRINGS, NEVADA

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INPUT RECORD # 221 MIRRORED ON 3/76
NAME: SPENCER HOT SPRINGS, NEV RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARING FIG: 8 NUMBER: 86 DATE: 01/75

LOCATION:

STATE: NEV COUNTY: LANDER
LATITUDE: 39 19.00 TOWNSHIP:
LONGITUDE: 116 51.00 RANGE:
ELEV: 5660 SECTION: 1/4 1/4 R&M:
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S),

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM; TERTIARY ASH-FLOW TUFF; JURASSIC GRANITIC; PALEOZOIC CHERT & QUARTZITE

SURFACE DISCHARGE TOTAL: 50.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: SEVERAL

TEMPERATURE: RANGE OF SPRING TEMP. 72 C TO

MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/73 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
72	0.0	6.50	77.00	200.00	36.00	43.00	51.0	22.0	672

OTHER CHEMICAL DATA SEE COMMENTS

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
120.0	123.5	93.5	210.4	140.5

RESERVOIR PROPERTIES

RANGE IN RES TEMP 115 C TO 210 C ASSUMED

BEST EST. AVER. TEMP 125.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.06 TO 0.47 E18 CAL; BEST ESTIMATE 0.15 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; MCKEE, 1968; STEWART AND MCKEE, 1970; WARING, 1965

TOPO MAPS: SPENCER H. S., 1:62,500; MILLET, 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

LOW FLOW RATE, LOW CHLORIDE, HIGH CA, & BICARB.

PREPARED BY: E. A. JOHNSON, J. RENNER

NAME: SPENCER HOT SPRINGS, NEV

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INPUT RECORD # 222 MIRRORED ON 3/76
NAME: HOT POT (BLOSSOM HOT SPRING) .NEV RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARING FIG: 8 NUMBER: 19A(?) DATE: 01/75

LOCATION:

STATE: NEV COUNTY: HUMBOLDT
LATITUDE: 40 55.33 TOWNSHIP: 35N
LONGITUDE: 117 6.51 RANGE: 43E
ELEV: 4440 SECTION: 11 SW 1/4 1/4 B&M MT. DIABLO
SURFACE MANIFESTATIONS: HOT SPRING(S)

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM; TERTIARY BASALT (?); CAMBRIAN QUARTZITE

SURFACE DISCHARGE TOTAL: 265.0 L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 1

TEMPERATURE: RANGE OF SPRING TEMP. 58 C TO
MAX. WELL TEMP. C AT M DEPTH. BOTTOM HOLE TEMP. C AT M DEPTH.

CHEMICAL DATA ANALYSIS DATE 00/73 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
58	0.0	8.00	80.00	286.00	33.00	29.00	60.0	28.0	823

OTHER CHEMICAL DATA SEE COMMENTS

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEONY	1/3	4/3
122.5	125.5	95.7	194.6	154.3

RESERVOIR PROPERTIES

RANGE IN RES TEMP. 80 C TO 130 C ASSUMED
BEST EST. AVER. TEMP 125.0
AREA 1.0 TO 8.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM
VOLUME 1.00 TO 16.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.04 TO 1.10 E18 CAL; BEST ESTIMATE 0.15 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; WARING, 1965; WILDEN, 1964

TOPO MAPS: HOT POT 1:24,000; WINNEMUCCA 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

HIGH CA & BICARBONATE; CALCITE PRT(?); INTERMITTENT RISES IN BROAD DEEP POOL.

PREPARED BY: E. A. JOHNSON, J. RENNER

NAME: HOT POT (BLOSSOM HOT SPRING) .NEV

INPUT RECORD # 223 MIRRORED ON 3/76
NAME: BUFFALO VALLEY HOT SPRINGS .NEV RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARING FIG: 6 NUMBER: 78 DATE: 01/75

LOCATION:

STATE: NEV COUNTY: LANDER
LATITUDE: 40 22.10 TOWNSHIP: 29N
LONGITUDE: 117 19.52 RANGE: 41E
ELEV: 4610 SECTION: 23 .SE1/4 1/4 H&M: MT. DIABLO
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM; QUATERNARY BASALT; TERTIARY TUFF

SURFACE DISCHARGE TOTAL: 36.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: 5.00E+02 L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 1.40E+06 CAL/SEC

AREA OF SURFACE EX: 0.3 KM**2

APPROX. # OF HOT SPRINGS: 200

TEMPERATURE: RANGE OF SPRING TEMP. 31 C TO 79 C OR

MAX. WELL TEMP. C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/73 SOURCE: MARINER AND OTHERS. 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
49	0.0	6.53	80.00	250.00	34.00	45.00	110.0	29.0	813

OTHER CHEMICAL DATA SEE COMMENTS

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
122.5	125.5	95.7	197.6	139.9

RESERVOIR PROPERTIES

RANGE IN RES TEMP 120 C TO 200

BEST EST. AVER. TEMP 130.0

AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 4.0 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.50 KM TO 1.50 KM; BEST ESTIMATE 0.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.50 TO 2.50 KM; BEST ESTIMATE 2.50 KM.

VOLUME 6.00 TO 10.00 KM**3; BEST ESTIMATE 10.00 KM**3

HEAT CONTENT > 15 C 0.38 TO 1.10 E18 CAL; BEST ESTIMATE 0.69 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS. 1974; WARING. 1965; STEWART & MCKEE. 1970; MCKEE. 1969; OLMSTED AND OTHERS. 1975

TOPO MAPS: BUFFALO SP. 1:62,500; WINNEMUCCA 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

HIGH CA & BICARB; LOW FLOW RATE. LARGEST SPRING DISCHARGES ABOUT 6 LPM

PREPARED BY: E. A. JOHNSON, J. RENNER

NAME: BUFFALO VALLEY HOT SPRINGS .NEV

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INPUT RECORD # 224 MIRRORED ON 3/76
NAME: THE HOT SPRING, NEVADA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 8 NUMBER: 11 DATE: 01/75

LOCATION:

STATE: NEVADA COUNTY: HUMBOLDT
LATITUDE: 41 25.40 TOWNSHIP: 41N
LONGITUDE: 117 22.96 RANGE: 41E
ELEV: 4500 SECTION: 20 NE1/4 1/4 BGN: MT. DIABLO
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S)

ROCK AND STRUCTURE TYPE: TERTIARY SEDIMENTARY ROCKS & FLOWS

SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2

APPROX: # OF HOT SPRINGS:
TEMPERATURE: RANGE OF SPRING TEMP: 58 C TO
MAX: WELL TEMP C AT # DEPTH BOTTOM HOLE TEMP, C AT # DEPTH

CHEMICAL DATA ANALYSIS DATE 00/73 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW	TEMP L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
58	0:0	8:00	55:00	296:00	36:00	10:00	36:0	26:0	881

OTHER CHEMICAL DATA SEE COMMENTS

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY		
106.4	106.8	75.1	173 209.3	473 197.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 210 C ASSUMED
BEST EST. AVERAGE TEMP 110.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES: 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES: 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.08 TO 0.47 E18 CAL; BEST ESTIMATE 0.13 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY
AVERAGE WELL FLOW TO KG/HRI WELL DIAMETER CM

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GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; WARING, 1965; WILDEN, 1964

TOPO MAPS: HOT SP BEAK 1:62,500; MCDEWITT 1:250,000

SPRING IDENTIFIED:

COMMENTS:

CALCITE PPT: (3); LOW CL; INTERMITTENT

PREPARED BY: E. A. JOHNSON; J. RENNER

NAME: THE HOT SPRING, NEVADA

INPUT RECORD # 225 MIRRORED ON 3/76
NAME: GOLCONDA HOT SPRINGS, NEVADA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARING FIG: 8 NUMBER: 19 DATE: 01/75

LOCATION:

STATE: NEVADA COUNTY: HUMBOLDT
LATITUDE: 40 57.69 TOWNSHIP: 36N
LONGITUDE: 117 29.63 RANGE: 40E
ELEV: 4360 SECTION: 29 SE1/4 1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM; CAMBRIAN QUARTZITE; TERTIARY VOLCANIC ROCKS.

SURFACE DISCHARGE TOTAL: 750.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 12

TEMPERATURE: RANGE OF SPRING TEMP. 74 C TO 49 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/73 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
74	0.0	6.53	66.00	130.00	22.00	33.00	56.0	18.0	429

OTHER CHEMICAL DATA SEE COMMENTS

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
114.1	115.7	84.8	200.7	120.8

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 210 C ASSUMED

BEST EST. AVER. TEMP 125.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON SEE COMMENTS

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.06 TO 0.47 E18 CAL; BEST ESTIMATE 0.15 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; WARING, 1965; FERGUSON AND OTHERS, 1952; WILDEN, 1964; ERICKSON AND MARSH, 1974;

TOPO MAPS: GOLCONDA 1:24,000; WINNEMUCCA 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

HIGH CA, BICARBONATE & MG (POSSIBLE MIXING (?)) RESORT AREA; MAY BE A CONSIDERABLY LARGER AREA.

PREFARED BY: E. A. JOHNSON, J. RENNER

NAME: GOLCONDA HOT SPRINGS, NEVADA

INPUT RECORD # 226 MIRRORED ON 3/76
NAME: SOU HOT SPRINGS (GILBERTS) NEVADA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 8 NUMBER: 68 DATE: 01/75
LOCATION:

STATE: NEVADA COUNTY: PERSHING
LATITUDE: 40 5.37 TOWNSHIP: 26N
LONGITUDE: 117 43.48 RANGE: 38E
ELEV: 3680 SECTION: 29 SE1/4 1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM; TERTIARY FLOWS & VOLCANICALLY DERIVED SEDIMENTS
SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: SEVERAL
TEMPERATURE: RANGE OF SPRING TEMP. 71 C TO 93 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/73 SOURCE: MARINER AND OTHERS
SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
73	0.0	8.10	65.00	165.00	26.00	110.00	370.0	75.0	312

OTHER CHEMICAL DATA SEE COMMENTS

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
113.4	114.9	84.0	189.5	99.3

RESERVOIR PROPERTIES

RANGE IN RES TEMP 95 C TO 120 C ASSUMED
BEST EST. AVER. TEMP 115.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.05 TO 0.26 E18 CAL; BEST ESTIMATE 0.14 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; WARING, 1965; TATLOCK, 1969

TOPO MAPS: CAIN MTN 1:62,500; WINNEMUCCA 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

NA-K-4/3CA ESTIMATE NEAR SP. TEMP.

PREPARED BY: E. A. JOHNSON, J. RENNER

NAME: SOU HOT SPRINGS (GILBERTS) , NEVADA

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INPUT RECORD # 227 MIRRORED ON 3/76
NAME: DIXIE HOT SPRINGS, NEV. RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARING FIG: 8 NUMBER: 71A DATE: 01/75

LOCATION:

STATE: NEV. COUNTY: CHURCHILL
LATITUDE: 39 47.86 TOWNSHIP: 22N
LONGITUDE: 118 4.04 RANGE: 35E
ELEV: 3424 SECTION: 5 .SE1/4 1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONS: HOT SPRING(S).

IC ROCKS

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM; TERTIARY VOLCANIC ROCKS; LATE MESOZOIC INTRUSIVE & METAMORPH

SURFACE DISCHARGE TOTAL: 200.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP. 72 C TO

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/73 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
72	0.0	8.60	115.00	190.00	6.50	3.60	111.0	126.0	111

OTHER CHEMICAL DATA SEE COMMENTS

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY		
139.4	145.5	118.1	1/3 143.3	4/3 137.1

RESERVOIR PROPERTIES

RANGE IN RES TEMP 135 C TO 155 C ASSUMED

BEST EST. AVER. TEMP 150.0

AREA 1.0 TO 3.0 KM**2; BEST ESTIMATE 2.0 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 6.00 KM**3; BEST ESTIMATE 3.00 KM**3

HEAT CONTENT > 15 C 0.07 TO 0.50 E18 CAL; BEST ESTIMATE 0.24 E18 CAL

PERMEABILITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; PAGE, 1965; WARING, 1965

TOPO MAPS: DIXIE N.S. 1:62,500; RENO 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

LOW CA, MODERATE CL & SI02

PREPARED BY: E. A. JOHNSON, J. RENNERT

NAME: DIXIE HOT SPRINGS, NEV.

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INPUT RECORD # 228 MIRRORED ON 3/76
NAME: THE NEEDLES (NEEDLE ROCKS), (PYRAMID LAKE), NEVADA RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 8 NUMBER: 49 DATE: 01/75

LOCATION:
STATE: NEVADA COUNTY: WASHOE
LATITUDE: 40 8.76 TOWNSHIP: 28N
LONGITUDE: 119 40.49 RANGE: 21E
ELEV: 3800 SECTION: 6 SW1/4 SW1/4 BLM
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: QUATERNARY TUSA & ALLUVIUM; TERTIARY OLIVINE BASALT

SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.5 KM**2
APPROX. # OF HOT SPRINGS: "SEVERAL" & WELLS ALONG 1.5 KM

TEMPERATURE: RANGE OF SPRING TEMP. 56 C TO 98 C OR
MAX. WELL TEMP 116 C AT 450 M DEPTH BOTTOM HOLE TEMP. 116 C AT 1800 M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/73 SOURCE: MARINER AND OTHERS, 1974

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HCO3
56	0.0	8.43	110.00	1160.00	160.00	260.00	340.0	1900.0	24

OTHER CHEMICAL DATA SEE COMMENTS SAMPLE FROM WELL

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
137.2	142.9	115.2	213.6	183.3

RESERVOIR PROPERTIES

RANGE IN RES TEMP 125 C TO 215 C ASSUMED
BEST EST. AVER. TEMP 145.0
AREA 1.0 TO 3.0 KM**2; BEST ESTIMATE 2.0 KM**2

BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 6.00 KM**3; BEST ESTIMATE 3.00 KM**3
HEAT CONTENT > 15 C 0.07 TO 0.72 E18 CAL; BEST ESTIMATE 0.23 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO DARCY
AVERAGE WELL FLOW TO KG/HRI WELL DIAMETER CM

GEOPHYSICAL SURVEYS:
DEVELOPMENTS: SEVERAL EXPLORATORY WELLS DRILLED
REFERENCES: MARINER AND OTHERS, 1974; WARING, 1965; BONHAM, 1969

TOPO MAPS: THE NEEDLES ROCK 1:24,000; LOVELOCK 1:250,000

SPRING IDENTIFIED YES
COMMENTS:

HIGH CHLORIDE CA; CALCITE PPT(?); BOILING-- IN WELL-- (?); LARGE FLOW OF HOT WATER, MAY BE CONSIDERABLY LARGER. W
ELL DATA FROM 2 WELLS.

PREPARED BY: E. A. JOHNSON, J. RENNER

NAME: THE NEEDLES (NEEDLE ROCKS), (PYRAMID LAKE), NEVADA

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INPUT RECORD # 229 MIRRORED ON 3/76
NAME: WALLEYS (GENOA) HOT SPRINGS ,NEV RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 8 NUMBER: 60 DATE: 01/75

LOCATION:

STATE: NEV COUNTY: DOUGLAS
LATITUDE: 38 58.87 TOWNSHIP: 13N
LONGITUDE: 119 49.92 RANGE: 19E
ELEV: 4670 SECTION: 22 ,NE1/4 1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: TRIASSIC & JURASSIC META VOLCANICS (GREENSCHIST)

SURFACE DISCHARGE TOTAL: 75.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: MANY

TEMPERATURE: RANGE OF SPRING TEMP. 61 C TO 71 C OR

MAX. WELL TEMP 83 C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/73 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
61	0.0	8.80	58.00	145.00	3.60	10.00	235.0	44.0	50

OTHER CHEMICAL DATA SEE COMMENTS

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY		
108.6	109.4	77.9	1/3 118.4	4/3 84.5

RESERVOIR PROPERTIES

RANGE IN RES TEMP 85 C TO 120 C ASSUMED

BEST EST. AVER. TEMP 110.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.03 TO 0.25 E18 CAL; BEST ESTIMATE 0.13 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; MOORE, 1969; WARING, 1965; GARSIDE, 1974

TOPO MAPS: HINDEN 1:24,000; WALKER LAKE 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

NA-K-4/3CA ESTIMATE NEAR SP. TEMP.; RESORT

PREPARED BY: E. A. JOHNSON, J. RENNER

NAME: WALLEYS (GENOA) HOT SPRINGS , NEV

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INPUT RECORD # 230 MIRRORED ON 3/76
NAME: NEVADA HOT SPRINGS (HINDS H.S.), NEV. RESOURCE CATEGORY: HOT WATER 90 TO 150 C
MARING FIG: 8 NUMBER: 61 DATE: 01/75
LOCATION:

STATE: NEV. COUNTY: LYON
LATITUDE: 38 53.97 TOWNSHIP: 12N
LONGITUDE: 119 24.70 RANGE: 23E
ELEV: 4659 SECTION: 16, SE1/4 1/4 BSM: MT. DIABLO
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S),

ROCK AND STRUCTURE TYPE: CRETACEOUS INTRUSIVE GRANITIC + MAFIC ROCKS

SURFACE DISCHARGE TOTAL: 200.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: SEVERAL

TEMPERATURE: RANGE OF SPRING TEMP, 61 C TO

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP, C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/73 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
61	0.0	8.70	52.00	102.00	2.50	4.50	169.0	17.0	54

OTHER CHEMICAL DATA SEE COMMENTS

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY		
104.1	104.2	72.2	1/3 118.5	4/3 86.2

RESERVOIR PROPERTIES

RANGE IN RES TEMP 85 C TO 110 C ASSUMED

BEST EST. AVER. TEMP 105.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.04 TO 0.23 E18 CAL; BEST ESTIMATE 0.12 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; MARING, 1965; MOORE, 1969;

TOPO MAPS: WELLINGTON 1:62,500; WALKER LAKE 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

NA-K-4/3CA ESTIMATE NEAR SP. TEMP. RESORT

PREPARED BY: E. A. JOHNSON

NAME: NEVADA HOT SPRINGS (HINDS H.S.) . NEV.

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INPUT RECORD # 231 MIRRORED ON 3/76
NAME: DARROUGH HOT SPRINGS .NEV. RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARING FIG: 8 NUMBER: 118 DATE: 01/75
LOCATION:

STATE: NEV. COUNTY: NYE
LATITUDE: 38 49.29 TOWNSHIP: 11N
LONGITUDE: 117 10.81 RANGE: 43E
ELEV: 5600 SECTION: 8, 1/4 1/4 85M: MT. DIABLO
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM; PALEOZOIC RHYOLITE
SURFACE DISCHARGE TOTAL: 350.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: SEVERAL

TEMPERATURE: RANGE OF SPRING TEMP. 71 C TO 97 C OR
MAX. WELL TEMP 129 C AT 230 M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/73 SOURCE: MARINER AND OTHERS, 1974
SPRING FLOW
TEMP L/MIN PH SIO2 NA K CA SO4 CL HCO3
95 0.0 8.30 98.00 110.00 2.60 1.30 53.0 12.0 146

OTHER CHEMICAL DATA SEE COMMENTS
SIO2 SIO2 SIO2 NA_K_CA OTHER
ADIABATIC CONDUCTIVE CHALCEDONY 1/3 4/3
131.8 136.4 107.9 126.5 119.3

RESERVOIR PROPERTIES
RANGE IN RES TEMP 125 C TO 145 C ASSUMED
BEST EST. AVER. TEMP 140.0
AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.07 TO 0.31 E18 CAL; BEST ESTIMATE 0.17 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

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GEOPHYSICAL SURVEYS:
DEVELOPMENTS:
REFERENCES: MARINER AND OTHERS, 1974; WARING, 1965; KLEINHAMPL AND ZIONY, 1967

TOPO MAPS: TONOPAH 1:250,000

SPRING IDENTIFIED:NO
COMMENTS:
BOILING; RESORT; WELL FLOWED AT 4300 LPM AT 101C. MAY BE CONSIDERABLY LARGER

PREPARED BY: E. A. JOHNSON, J. RENNER

NAME: DARROUGH HOT SPRINGS .NEV.

INPUT RECORD # 232 MIRRORED ON 3/76
NAME: UNNAMED WARM SP NEAR WARM SPRINGS ,NEV. RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 8 NUMBER: 125 DATE: 01/75

LOCATION:

STATE: NEV. COUNTY: NYE
LATITUDE: 38 11.29 TOWNSHIP: 04N
LONGITUDE: 116 22.48 RANGE: 50E
ELEV: 5530 SECTION: 20 ,SW1/4 1/4 H&M: MT. DIABLO
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: TERTIARY VOLCANICS & PALEOZOIC SEDIMENTARY ROCKS.

SURFACE DISCHARGE TOTAL: L/MIN

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 2

TEMPERATURE: RANGE OF SPRING TEMP. 61 C TO

MAX. WELL TEMP. C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/73 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
61	0.0	8.10	60.00	175.00	24.00	43.00	120.0	32.0	714

OTHER CHEMICAL DATA SEE COMMENTS

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
110.0	111.0	79.7	191.7	121.2

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 195 C ASSUMED

BEST EST. AVER. TEMP 125.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM;

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.06 TO 0.43 E18 CAL; BEST ESTIMATE 0.15 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO DARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: KLEINHAMPL AND ZIONY, 1967; MARINER AND OTHERS, 1974; WARING, 1965

TOPO MAPS: WARM SPRING 1:62,500; TONOPAH 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

HIGH CA, MG, BICARBONATE; PROBABLY LOW TEMP.

PREPARED BY: E. A. JOHNSON, J. RENNER

NAME: UNNAMED WARM SP NEAR WARM SPRINGS , NEV.

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INPUT RECORD # 233 MIRRORED ON 3/76
NAME: BARTHOLOMAE (GLOBE) HOT SPRINGS ,NEV. RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 8 NUMBER: 938 DATE: 01/75
LOCATION:

STATE: NEV. COUNTY: EUREKA
LATITUDE: 39 24.32 TOWNSHIP: 18N
LONGITUDE: 116 20.78 RANGE: 50E
ELEV: 6342 SECTION: 28 .SE1/4 1/4 B&M: MT. DIABLO
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: QUATERNARY ALLUVIUM; TERTIARY VOLCANIC ROCKS
SURFACE DISCHARGE TOTAL: 380.0 L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP. 54 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/73 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	MC03
54	0.0	9.25	85.00	64.00	0.70	1.00	18.0	6.3	144

OTHER CHEMICAL DATA SEE COMMENTS

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
125.2	128.7	99.3	91.7	72.3

RESERVOIR PROPERTIES

RANGE IN RES TEMP 70 C TO 135 C ASSUMED

BEST EST. AVER. TEMP 130.0

AREA 1.0 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.03 TO 0.29 E18 CAL; BEST ESTIMATE 0.15 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; ROBERTS AND OTHERS, 1967; WARING, 1965

TOPO MAPS: ANTELOPE PEAK 1:62,500 ; MILLETT 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

NA-K-4/3CA ESTIMATE NEAR SP. TEMP.

PREPARED BY: E. A. JOHNSON, J. RENNER

NAME: BARTHOLOMAE (GLOBE) HOT SPRINGS , NEV.

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Selected Geothermal Resources Assessment Data

Hydrothermal Convection Systems in New Mexico

By: E. D. Patterson, Roswell, New Mexico

and

J. L. Renner, Denver, Colorado

Contents

Hot-Spring Data Sheets

Hot water greater than 150°C

Hot water from 90° to 150°C

References

INPUT RECORD # 234 MIRRORED ON 3/76
NAME: VALLES CALDERA, NEW MEX. RESOURCE CATEGORY: HOT WATER > 150 C
WARING FIG: 2 NUMBER: 12 DATE: 03/75

LOCATION:

STATE: NEW MEX. COUNTY: SANDOVAL
LATITUDE: 35 43.00 TOWNSHIP: 20N
LONGITUDE: 106 32.00 RANGE: 03E
ELEV: 8687 SECTION: 35, 1/4 1/4 B&M: NEW MEXICO
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: PLEISTOCENE CALDERA VOLCANICS

SURFACE DISCHARGE TOTAL: L/MIN

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 5 AREAS IN CALDERA

TEMPERATURE: RANGE OF SPRING TEMP. 25 C TO 87 C OR

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE:

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03
0	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
0.0	0.0	0.0	0.0	0.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 300 C ASSUMED

BEST EST. AVER. TEMP 240.0

AREA 45.0 TO 300.0 KM**2; BEST ESTIMATE 65.0 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.50 KM TO 2.00 KM; BEST ESTIMATE 1.00 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.50 KM; BEST ESTIMATE 2.00 KM.

VOLUME 45.00 TO 750.00 KM**3; BEST ESTIMATE 130.00 KM**3

HEAT CONTENT > 15 C 2.30 TO 130.00 E18 CAL; BEST ESTIMATE 18.00 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS: MORE THAN 6 GEOTHERMAL WELLS DRILLED, DEPTHS REPORTED TO RANGE FROM 900M TO 2900M

REFERENCES: WARING, 1965; SMITH AND OTHERS, 1970; SUMMERS, 1965 A,B.

TOPO MAPS: VALLE SAN ANTONIO 1:24,000

SPRING IDENTIFIED: YES

COMMENTS:

TEMPERATURE ESTIMATED FROM HERESAY REPORTS OF DRILLING. SPRINGS AND A DEEP WELL (REC) ON THE WEST RIM OF CALDE
RA SUGGEST TEMPERATURE ABOVE 200C POSSIBLE. UNION OIL DRILLING EXPLORATORY (UEVELOPMENT ?) WELLS IN AREA. POSS
IBLY A SMALL VAPOR DOMINATED AREA UNDERLAIN BY HIGH CHLORIDE HOT WATER SYSTEM. 1 GROUP ACID SULFATE SPRINGS.

PREPARED BY: J. RENNER, G. PATTERSON

NAME: VALLES CALDERA, NEW MEX.

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INPUT RECORD # 235 MIRRORED ON 3/76
NAME: LIGHTNING DOCK AREA NEW MEX. RESOURCE CATAGORY: HOT WATER > 150 C
WARNING FIG: NUMBER: DATE: 03/75

LOCATION:

STATE: NEW MEX. COUNTY: HIDALGO
LATITUDE: 32 8.50 TOWNSHIP: 25S
LONGITUDE: 108 50.00 RANGE: 19W
ELEV: 4200 SECTION: 7 SW1/4 SE1/4 B&M: NEW MEX.
SURFACE MANIFESTATIONS: FOUND BY DRILLING

ROCK AND STRUCTURE TYPE: ALLUVIUM OVER TERTIARY VOLCANICS

SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 0

TEMPERATURE: RANGE OF SPRING TEMP.

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. 121 C AT 2173 M DEPTH

CHEMICAL DATA ANALYSIS DATE 04/54 SOURCE: SUMMERS, 1965A (WELL)

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HCO3
99	0.0	0.00	138.00	324.00	21.00	21.50	475.0	81.5	159

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY		
148.4	156.3	130.4	173 168.5	473 144.3

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 180 C ASSUMED

BEST EST. AVER. TEMP 170.0

AREA 0.0 TO 0.0 KM**2 BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM

DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM

THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM

VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.20 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY

AVERAGE WELL FLOW TO KG/HRI WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS: 3 SHALLOW WELLS 27-46 M; REPORTED 107C

REFERENCES: SUMMERS 1965 A; RINTZINGER, 1956

TOPO MAPS: SWALLOW FORK PK 1:24,000

SPRING IDENTIFIED BY:

COMMENTS:

GEOCHEMISTRY, TEMPERATURE DATA AND LOCATION FROM 173M WELL. 3 KM **2 AREA OF RAPID SNOW MELTS, WARM WATER APPEARS TO RISE AND FLOW OUTWARD IN SHALLOW ZONE. DEEP WELL 3 KM NORTH REACHED ONLY 121 AT 2KM. MAY BE MORE EXTENSIVE. THE NEAR SURFACE WARM AREA APPEARS TO BE 3 KM. IF A LOWER AVE. TEMP., ABOUT 130C, THEN AREA 4KM**2 THICKNESS 2KM HEAT = 1.5E+18 CAL.

PREPARED BY: J. RENNER & E. PATTERSON

NAME: LIGHTNING DOCK AREA , NEW MEX.

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INPUT RECORD # 236 MIRRORED ON 3/76
NAME: JEMEZ SPRINGS (OJOS CALIENTES) ,NEW MEX. RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 2 NUMBER: 15 DATE: 03/75

LOCATION:

STATE: NEW MEX. COUNTY: SANDOVAL
LATITUDE: 35 47.00 TOWNSHIP: 18N
LONGITUDE: 106 41.00 RANGE: 02E
ELEV: 6200 SECTION: 23 . 1/4 1/4 H&M: NEW MEXICO

SURFACE MANIFESTATIONS:

ROCK AND STRUCTURE TYPE:

SURFACE DISCHARGE TOTAL: 756.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 10

TEMPERATURE: RANGE OF SPRING TEMP. 51 C TO 73 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 08/49 SOURCE: SUMMERS 1965

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03
66	0.0	7.20	93.00	572.00	70.00	138.00	49.0	795.0	735

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
129.3	133.6	104.7	196.6	151.5

RESERVOIR PROPERTIES

RANGE IN RES TEMP 0 C TO 0 C ASSUMED
BEST EST. AVER. TEMP 135.0
AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.30 KM**3
HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.16 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: SUMMERS , 1965, A,B; WARING, 1965

TOPO MAPS: JEMEZ SPRINGS 1:24,000

SPRING IDENTIFIED: YES

COMMENTS:

PROBABLY PASSES THROUGH CARBONATE ROCKS ; 9.7 KM SSW OF VALLES CALDERA

PREPARED BY: J. RENNER & PATTERSON

NAME: JEMEZ SPRINGS (OJOS CALIENTES) . NEW MEX.

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INPUT RECORD # 237 MIRRORED ON 3/76
NAME: RADIUM, NEW MEX. RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARING FIG: 2 NUMBER: 38 DATE: 03/75

LOCATION:

STATE: NEW MEX. COUNTY: DONA ANA
LATITUDE: 32 30.00 TOWNSHIP: 21S
LONGITUDE: 106 55.50 RANGE: 01W
ELEV: 4000 SECTION: 10 NW1/4 NE1/4 B&M: NEW MEXICO
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: SANTA FE GROUP
SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP, 52 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER 1975 UNPUBLISHED USGS DATA

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HCO3
52	0.0	0.00	78.00	1100.00	160.00	120.00	0.0	0.0	0

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
121.4	124.2	94.2	222.0	213.5

RESERVOIR PROPERTIES

RANGE IN RES TEMP 0 C TO 0
BEST EST. AVER. TEMP 130.0
AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.30 KM**3
HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.16 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: SUMMERS, 1965, A,B; WARING, 1965

TOPO MAPS: SAN DIEGO MTN, 1162,500

SPRING IDENTIFIED: YES

COMMENTS:

DUE TO LOW SI02 CONTENT AND POSSIBLE LIMESTONE AT DEPTH TEND TO FAVOR SI02 TEMP. NOTE: RESERVOIR MAY BE MUCH HOTTER. MAY HAVE PPCT IN WELL

PREPARED BY: RENNER & PATTERSON

NAME: RADIUM, NEW MEX.

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INPUT RECORD # 238 MIRRORED ON 3/76
NAME: LOWER FRISCO H.S. NEW MEX. RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARING FIG: 2 NUMBER: 25 DATE: 03/75

LOCATION:

STATE: NEW MEX. COUNTY: CATRON
LATITUDE: 33 15.00 TOWNSHIP: 12S
LONGITUDE: 108 47.00 RANGE: 20W
ELEV: 4560 SECTION: 23, 1/4 1/4 B&M: NEW MEXICO

SURFACE MANIFESTATIONS:

ROCK AND STRUCTURE TYPE: TERTIARY LAVA
SURFACE DISCHARGE TOTAL: 76.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP.

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/74 SOURCE: MARINER UNPUBLISHED USGS DATA

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03
37	0.0	0.00	84.00	280.00	15.00	46.00	0.0	0.0	0

OTHER CHEMICAL DATA MARINER UNPUBLISHED 1975

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
124.7	128.1	98.6	150.4	107.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 0 C TO 160 C ASSUMED

BEST EST. AVER. TEMP 150.0

AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.30 KM**3

HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.18 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MUARCYS

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

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GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: SUMMERS, 1965A, B; WARING, 1965

TOPO MAPS: WILSON MTN. 1:24,000

SPRING IDENTIFIED: NO

COMMENTS:

PREPARED BY: PATTERSON, RENNER

NAME: LOWER FRISCO H.S. NEW MEX.

INPUT RECORD # 239 MIRRORED ON 3/76
NAME: GILA HOT SPRINGS, NEW MEX. RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 2 NUMBER: 30 DATE: 03/75

LOCATION:

STATE: NEW MEX. COUNTY: GRANT.
LATITUDE: 33 12:00 TOWNSHIP: 13S
LONGITUDE: 108 12:00 RANGE: 13W
ELEV: 5600 SECTION: 5, 1/4 1/4 86M: 66SR

SURFACE MANIFESTATIONS:

ROCK AND STRUCTURE TYPE: QUATERNARY BASALT; TERTIARY RHYOLITE
SURFACE DISCHARGE TOTAL: 3400.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 4

TEMPERATURE: RANGE OF SPRING TEMP: 32 C TO 68 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER 1975 UNPUBLISHED USGS DATA

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HCO3
68	0.0	0.00	74.00	130.00	3.00	9.90	0.0	0.0	0

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY		
119.0	121.5	91.2	173 114.0	473 77.5

RESERVOIR PROPERTIES

RANGE IN RES TEMP 0 C TO 0
BEST EST. AVER. TEMP 125.0
AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES: 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM
DEPTH TO BOTTOM OF RES: 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM
THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM
VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.30 KM**3
HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.15 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: SUMMER 1965; AIB; WARNING; 1965

TOPO MAPS: GILA HOT SPRING 1124:000

SPRING IDENTIFIED: YES

COMMENTS:

AREA MAY BE SOMEWHAT LARGER

PREPARED BY: RENNER & PATTERSON

NAME: GILA HOT SPRINGS, NEW MEX.

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References cited - New Mexico

- Kintzinger, P. R., 1956, Geothermal Survey of hot ground near Lordsburg, New Mexico: Science, v. 124, p. 629.
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- Summers, W. K., 1965a, A preliminary report on New Mexico's geothermal energy resources: New Mexico Bur. Mines and Mineral Resources Circ. 80, 41 p.
- _____ 1965b, Chemical characteristics of New Mexico's thermal waters-- A critique: New Mexico Bur. Mines and Mineral Resources Circ. 83, 27 p.
- Waring, G. A., 1965, Thermal springs of the United States and other countries of the world--A summary: U.S. Geol. Survey Prof. Paper 492, 383 p.

Selected Geothermal Resources Assessment Data

Hydrothermal Convection Systems in Oregon

By: F. W. Smith, Menlo Park, California

J. L. Renner, Denver, Colorado

and

K. E. Telleen, Menlo Park, California

Contents

Hot-Spring Data Sheets

Hot water greater than 150°C

Hot water from 90° to 150°C

References

INPUT RECORD # 240 MIRRORED ON 3/76
 NAME: MICKEY SPRINGS ,OR RESOURCE CATAGORY: HOT WATER > 150 C
 WARING FIG: NUMBER: DATE: 12/74
 LOCATION:
 STATE: OR COUNTY: HARNEY
 LATITUDE: 42 40.54 TOWNSHIP: 33S
 LONGITUDE: 118 20.67 RANGE: 3SE
 ELEV: 4060 SECTION: 13 , 1/4 1/4 H&M: WIL
 SURFACE MANIFESTATIONS: SINTER, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: ANDESITE TUFF-BRECCIA
 SURFACE DISCHARGE TOTAL: 100.0 L/MIN ESTIMATED: X
 CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
 TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
 AREA OF SURFACE EX: 0.1 KM**2
 APPROX. # OF HOT SPRINGS: SEVERAL

TEMPERATURE: RANGE OF SPRING TEMP. 73 C TO
 MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER AND OTHERS, 1974
 SPRING FLOW
 TEMP L/MIN PH SIO2 NA K CA S04 CL HC03
 73 0.0 8.00 200.00 550.00 35.00 0.90 230.0 240.0 774

OTHER CHEMICAL DATA
 SIO2 SIO2 SIO2 NA_K_CA OTHER
 ADIABATIC CONDUCTIVE CHALCEDONY 1/3 4/3 NA-K
 168.1 180.1 158.1 206.8 330.4 136

RESERVOIR PROPERTIES
 RANGE IN RES TEMP 160 C TO 250 C ASSUMED
 BEST EST. AVER. TEMP 210.0
 AREA 0.1 TO 36.0 KM**2; BEST ESTIMATE 6.0 KM**2
 BASED ON GEOLOGY, GEOPHYSICS
 DEPTH TO TOP OF RES. 0.50 KM TO 2.00 KM; BEST ESTIMATE 1.00 KM.
 DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
 THICKNESS 1.00 TO 2.50 KM; BEST ESTIMATE 2.00 KM.
 VOLUME 0.10 TO 90.00 KM**3; BEST ESTIMATE 12.00 KM**3
 HEAT CONTENT > 15 C 0.01 TO 10.53 E18 CAL; BEST ESTIMATE 1.40 E18 CAL
 POROSITY TO BEST ESTIMATE
 PERMEABILITY TO MDARCY;
 AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

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GEOPHYSICAL SURVEYS: HEATFLOW, TEMPERATURE GRADIENT, AMT, GRAVITY, MAG
 DEVELOPMENTS:
 REFERENCES: MARINER AND OTHERS, 1974 , WALKER AND REPENNING, 1965

TOPO MAPS: ADEL 1:250,000

SPRING IDENTIFIED: YES
 COMMENTS:

PREPARED BY: F. SMITH, J. RENNER

NAME: MICKEY SPRINGS . OR

INPUT RECORD # 241 MIRRORED ON 3/76
NAME: ALVORD HOT SPRING ,OR RESOURCE CATEGORY: HOT WATER > 150 C
WARNING FIG: 6 NUMBER: 068 DATE: 01/75
LOCATION:

STATE: OR COUNTY: HARNEY
LATITUDE: 42 32.57 TOWNSHIP: 34S
LONGITUDE: 118 31.63 RANGE: 34E
ELEV: 4100 SECTION: 33 . 1/4 1/4 H&M: WIL
SURFACE MANIFESTATIONS: HOT SPRING(S),

ROCK AND STRUCTURE TYPE: RHYODACITE, ANDESITE, BASALT
SURFACE DISCHARGE TOTAL: 500.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.5 KM**2
APPROX. # OF HOT SPRINGS: SEVERAL

TEMPERATURE: RANGE OF SPRING TEMP. 76 C TO

MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER AND OTHERS, 1974

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
76	0.0	6.70	120.00	960.00	69.00	13.00	220.0	780.0	1196

OTHER CHEMICAL DATA B30;MG2.2;LI2.1;F10.2

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	NA-K
141.5	147.9	120.9	198.6	148

RESERVOIR PROPERTIES

RANGE IN RES TEMP 150 C TO 240 C ASSUMED

BEST EST. AVER. TEMP 200.0

AREA 0.0 TO 31.0 KM**2; BEST ESTIMATE 3.0 KM**2

BASED ON GEOLOGY, GEOPHYSICS

DEPTH TO TOP OF RES. 1.00 KM TO 2.50 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 0.50 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 0.03 TO 62.00 KM**3; BEST ESTIMATE 4.50 KM**3

HEAT CONTENT > 15 C 0.00 TO 6.88 E18 CAL; BEST ESTIMATE 0.50 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS: TEMPERATURE GRADIENT, AMT, GRAVITY, MAG, HEAT FLOW

DEVELOPMENTS: WATER USED LOCALLY

REFERENCES: MARINER AND OTHERS, 1974; WARING, 1965; WALKER AND REPENNING, 1965

TOPO MAPS: ADEL 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

PREPARED BY: F. SMITH, J. RENNER

NAME: ALVORD HOT SPRING , OR

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INPUT RECORD # 242 MIRRORED ON 3/76
NAME: HOT LAKE ,OR RESOURCE CATAGORY: HOT WATER > 150 C
WARING FIG: 6 NUMBER: 69,70 DATE: 09/75

LOCATION:

STATE: OR COUNTY: HARNEY
LATITUDE: 42 20.14 TOWNSHIP: 37S
LONGITUDE: 118 35.96 RANGE: 33E
ELEV: 4050 SECTION: 15 . 1/4 1/4 B&M: WIL
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: ALLUVIUM, ANDESITE, BASALT
SURFACE DISCHARGE TOTAL: 15.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.1 KM**2
APPROX. # OF HOT SPRINGS: 2

TEMPERATURE: RANGE OF SPRING TEMP. 36 C TO

MAX. WELL TEMP. C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
96	0.0	7.30	160.00	450.00	28.00	14.00	434.0	250.0	374

OTHER CHEMICAL DATA B-15; F-7.2

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
156.1	165.5	141.0	175.8	178.2

RESERVOIR PROPERTIES

RANGE IN RES TEMP 160 C TO 225 C ASSUMED

BEST EST. AVER. TEMP 180.0

AREA 0.1 TO 26.0 KM**2; BEST ESTIMATE 6.0 KM**2

BASED ON GEOLOGIC INFERENCE

DEPTH TO TOP OF RES. 0.50 KM TO 2.00 KM; BEST ESTIMATE 1.00 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.50 KM; BEST ESTIMATE 2.00 KM.

VOLUME 0.10 TO 65.00 KM**3; BEST ESTIMATE 12.00 KM**3

HEAT CONTENT > 15 C 0.01 TO 6.43 E18 CAL; BEST ESTIMATE 1.20 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; WARING, 1965; WALKER, AND REPENNING, 1965; WALKER, 1973

TOPO MAPS: ADEL 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

ASSOCIATED WITH SURFICIAL BORAX DEPOSITS; GEOCHEMISTRY MAY BE INFLUENCED BY SALINES

PREPARED BY: F. SMITH, J. RENNER

NAME: HOT LAKE , OR

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INPL. RECORD # 243 MIRRORED ON 3/76
NAME: VALE HOT SPRINGS, ORE RESOURCE CATEGORY: HOT WATER > 150 C
WARNING FIG: 6 NUMBER: 77 DATE: 05/75

LOCATION:
STATE: ORE COUNTY: MALHEUR
LATITUDE: 43 59.39 TOWNSHIP: 18S
LONGITUDE: 117 14.06 RANGE: 4SE
ELEV: 2200 SECTION: 20 1/4 1/4 86M: WIL
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: LOOSELY CONSOLIDATED SANDSTONE, SILTSTONE, SOME FRESHWATER LIMESTONE, OCCASIONALL
Y. INTERBEDDED W/BASALT FLOWS

SURFACE DISCHARGE TOTAL: 75.6 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: SEVERAL

TEMPERATURE: RANGE OF SPRING TEMP. 97 C TO

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER, 1975, UNPUBLISHED DATA

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
73	0.0	7.47	130.00	310.00	16.00	19.00	104.0	360.0	143

OTHER CHEMICAL DATA MARINER 75 UNPUBLISHED

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
145.4	152.7	126.3	157.3	135.1

RESERVOIR PROPERTIES

RANGE IN RES TEMP 145 C TO 175 C ASSUMED

BEST EST. AVER. TEMP 160.0

AREA 10.0 TO 150.0 KM**2; BEST ESTIMATE 50.0 KM**2

BASED ON AMT, HEATFLOW, GEOLOGY

DEPTH TO TOP OF RES. 0.75 KM TO 2.00 KM; BEST ESTIMATE 1.00 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.25 KM; BEST ESTIMATE 2.00 KM.

VOLUME 10.00 TO 337.50 KM**3; BEST ESTIMATE 100.00 KM**3

HEAT CONTENT > 15 C 0.87 TO 29.36 E18 CAL; BEST ESTIMATE 8.70 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MOARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS: AMT, HEAT FLOW, GRAVITY

DEVELOPMENTS:

REFERENCES: WARING, 1965; WALKER, G. W., 1973; CORCORAN AND OTHERS, 1962

TOPO MAPS: VALE EAST QUAD, ORE (1:24,000) HOISE, IDAHO, ORE, 1:250,000

SPRING IDENTIFIED: NO

COMMENTS:

LARGE AREA INDICATED BY HEAT FLOW AND AMT; ALTHOUGH ANOMALIES NOT COINCIDENT

PREPARED BY: F. SMITH, J. RENNER, D. WILLIAMS

NAME: VALE HOT SPRINGS, ORE

INPUT RECORD # 244 MIRRORED ON 3/76
NAME: NEAL HS .OR RESOURCE CATEGORY: HOT WATER > 150 C
WARNING FIG: 6 NUMBER: 075 DATE: 12/74
LOCATION:

STATE: OR COUNTY: MALHEUR
LATITUDE: 44 1.40 TOWNSHIP: 18S
LONGITUDE: 117 27.60 RANGE: 43E
ELEV: 2600 SECTION: 9 1/4 NW1/4 B&M: WIL
SURFACE MANIFESTATIONS: SINTER, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: BASALT
SURFACE DISCHARGE TOTAL: 90.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 1

TEMPERATURE: RANGE OF SPRING TEMP. 87 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
87	0.0	7.32	180.00	190.00	16.00	8.80	120.0	120.0	198

OTHER CHEMICAL DATA B 4.1; MG 0.2; LI 0.3; F 9.4

SI02	SI02	SI02	NA_K_CA	OTHER	
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3	NA-K
162.4	173.1	149.8	180.8	151.1	164

RESERVOIR PROPERTIES

RANGE IN RES TEMP 150 C TO 200 C ASSUMED

BEST EST. AVER. TEMP 180.0

AREA 1.0 TO 10.0 KM**2; BEST ESTIMATE 2.0 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.75 KM TO 2.00 KM; BEST ESTIMATE 1.00 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.25 KM; BEST ESTIMATE 2.00 KM.

VOLUME 1.00 TO 22.50 KM**3; BEST ESTIMATE 4.00 KM**3

HEAT CONTENT > 15 C 0.10 TO 2.23 E18 CAL; BEST ESTIMATE 0.40 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS: WATER USED LOCALLY

REFERENCES: MARINER AND OTHERS, 1974; WARING, 1965

TOPO MAPS: JAMIESON 1:62,500, BAKER 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

PREPARED BY: F. SMITH, J. RENNER

NAME: NEAL HS . OR

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INPUT RECORD # 245 MIRRORED ON 3/76
NAME: LAKEVIEW (HUNTERS, BARRY RANCH) ,OR RESOURCE CATAGORY: HOT WATER > 150 C
WARNING FIG: 6 NUMBER: 45.47 DATE: 01/75

LOCATION:

STATE: OR COUNTY: LAKE
LATITUDE: 42 12.00 TOWNSHIP: 39S
LONGITUDE: 120 21.60 RANGE: 20E
ELEV: 4800 SECTION: 15, 1/4 1/4 B&M: WIL
SURFACE MANIFESTATIONS: SINTER, TRAVERTINE, HOT SPRING(S), GEYSER(S).

ROCK AND STRUCTURE TYPE: ANDESITE, ANDESITE TUFF BRECCIA

SURFACE DISCHARGE TOTAL: 2500.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 5.0 KM**2

APPROX. # OF HOT SPRINGS: 16

TEMPERATURE: RANGE OF SPRING TEMP. 88 C TO 96 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
96	0.0	7.70	140.00	210.00	8.50	13.00	260.0	120.0	79

OTHER CHEMICAL DATA 8-6.9IF-4.4

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
149.2	157.2	131.4	142.7	113.9

RESERVOIR PROPERTIES

RANGE IN RES TEMP 140 C TO 170 C ASSUMED

BEST EST. AVER. TEMP 160.0

AREA 5.0 TO 30.0 KM**2; BEST ESTIMATE 8.0 KM**2

BASED ON GEOLOGY, SURFACE EXPRESSION

DEPTH TO TOP OF RES. 0.75 KM TO 2.00 KM; BEST ESTIMATE 1.00 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.25 KM; BEST ESTIMATE 2.00 KM.

VOLUME 5.00 TO 67.50 KM**3; BEST ESTIMATE 16.00 KM**3

HEAT CONTENT > 15 C 0.43 TO 5.87 E18 CAL; BEST ESTIMATE 1.40 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS: WELL AT HUNTERS HOT SPRING HEATS HOTEL

REFERENCES: MARINER AND OTHERS, 1974; WARING, 1965; PETERSON & MCINTYRE, 1970; WALKER, 1963

TOPO MAPS: LAKEVIEW NW 1:24,000

SPRING IDENTIFIED: YES

COMMENTS:

INCLUDES THE AREA SURROUNDING AND BETWEEN BARRY AND HUNTERS HOT SPRINGS.

PREPARED BY: J. RENNER, F. SMITH

NAME: LAKEVIEW (HUNTERS, BARRY RANCH) , OR

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INPUT RECORD # 246 MIRRORED ON 3/76
NAME: CRUMPS SPRING .ORE RESOURCE CATAGORY: HOT WATER > 150 C
WARING FIG: 6 NUMBER: 49C DATE: 01/75

LOCATION:

STATE: ORE COUNTY: LAKE
LATITUDE: 42 15.00 TOWNSHIP: 38S
LONGITUDE: 119 53.00 RANGE: 24E
ELEV: 5000 SECTION: 34 .SW1/4 1/4 B&M: WIL
SURFACE MANIFESTATIONS: SINTER, GEYSER(S).

ROCK AND STRUCTURE TYPE: FAULTED LAKE BEDS OVERLY OLIVINE BASALT
SURFACE DISCHARGE TOTAL: 50.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 1.0 KM**2
APPROX. # OF HOT SPRINGS: 4

TEMPERATURE: RANGE OF SPRING TEMP. 78 C TO
MAX. WELL TEMP 121 C AT 198 M DEPTH BOTTOM HOLE TEMP. C AT 505 M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
78	0.0	7.30	180.00	280.00	11.00	16.00	200.0	240.0	0

OTHER CHEMICAL DATA (B=13.6), (MG=0.2), (LI=(0.4)), (F=4.9)

ADIAHATIC	SI02	SI02	SI02	NA_K_CA	OTHER
162.4	173.1	149.8	144.2	4/3	NA-K 96

RESERVOIR PROPERTIES

RANGE IN RES TEMP 150 C TO 200 MEASURED

BEST EST. AVER. TEMP 180.0

AREA 1.0 TO 8.0 KM**2; BEST ESTIMATE 4.0 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.75 KM TO 2.00 KM; BEST ESTIMATE 1.00 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.25 KM; BEST ESTIMATE 2.00 KM.

VOLUME 1.00 TO 18.00 KM**3; BEST ESTIMATE 8.00 KM**3

HEAT CONTENT > 15 C 0.01 TO 1.78 E18 CAL; BEST ESTIMATE 0.80 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS: WELL THAT ERUPTS AS GEYSER

REFERENCES: MARINER AND OTHERS, 1974; RINEHART, 1970; WARING, 1965; WALKER AND REPENNING, 1965; PETERSON, 1959

TOPO MAPS: ADEL ONE. 1:24,000

SPRING IDENTIFIED: YES

COMMENTS:

SMALL SINTER AREA. WATER SUPPLY FOR CATTLE.

PREPARED BY: F. SMITH, J. RENNER

NAME: CRUMPS SPRING . ORE

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INPUT RECORD # 247 MIRRORED ON 3/76
NAME: WEBERG H.S., OR RESOURCE CATEGORY: HOT WATER > 150 C
WARNING FIG: NUMBER: DATE: 01/75

LOCATION:
STATE: OR COUNTY: GRANT
LATITUDE: 44 0.00 TOWNSHIP: 18S
LONGITUDE: 119 38.80 RANGE: 26E
ELEV: 5000 SECTION: 18 1/4 1/4 B&M: WIL
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: ARKOSIC SANDSTONE
SURFACE DISCHARGE TOTAL: 40.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 1

TEMPERATURE: RANGE OF SPRING TEMP. 46 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER AND OTHERS, 1974
SPRING FLOW
TEMP L/MIN PH SIO2 NA K CA SO4 CL HCO3
46 0.0 6.53 82.00 610.00 36.00 38.00 13.0 50.0 1710

OTHER CHEMICAL DATA B15: MG 7.8; LI 0.7; F 3.9
SIO2 SIO2 SIO2 NA_K_CA OTHER
ADIABATIC CONDUCTIVE CHALCEDONY 1/3 4/3
123.6 126.8 97.2 169.6 162.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 125 C TO 175 C ASSUMED
BEST EST. AVER. TEMP 170.0
AREA 0.5 TO 3.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 0.50 KM TO 2.10 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.50 KM; BEST ESTIMATE 1.50 KM.
VOLUME 0.50 TO 7.50 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.03 TO 0.72 E18 CAL; BEST ESTIMATE 0.20 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MOARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; GREENE AND OTHERS, 1972; BROWN AND THAYER, 1966

TOPO MAPS: BURNS 1:250,000

SPRING IDENTIFIED: NO
COMMENTS:

PREPARED BY: F. SMITH, J. RENNER

NAME: WEBERG H.S., OR

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INPUT RECORD # 248 MIRRORED ON 3/76
NAME: MT HOOD ,OR RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 6 NUMBER: 001 DATE: 12/74
LOCATION:

STATE: OF COUNTY: WASCO/CLACKAMAS
LATITUDE: 45 22.50 TOWNSHIP: 02S
LONGITUDE: 121 42.50 RANGE: 09E
ELEV: 10000 SECTION: 29 , 1/4 1/4 B&M: WIL
SURFACE MANIFESTATIONS: FUMAROLE OR WARM VAPOR,

ROCK AND STRUCTURE TYPE: LAVA(QUATERNARY)
SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP. 49 C TO 90 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE:

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
0	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
0.0	0.0	0.0	0.0	0.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 90 C TO 150 C ASSUMED
BEST EST. AVER. TEMP 125.0

AREA 1.0 TO 45.0 KM**2; BEST ESTIMATE 2.0 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.50 KM TO 2.00 KM; BEST ESTIMATE 1.00 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.50 KM; BEST ESTIMATE 2.00 KM.

VOLUME 1.00 TO 112.50 KM**3; BEST ESTIMATE 4.00 KM**3

HEAT CONTENT > 15 C 0.07 TO 7.42 E18 CAL; BEST ESTIMATE 0.26 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MOARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1965; WATERS, 1968B; PECK AND OTHERS, 1964

TOPO MAPS: CATHEDRAL RIDGE, ORE 1:24,000; TIMBERLINE LODGE, ORE 1:24,000

SPRING IDENTIFIED:NO

COMMENTS:

PREPARED BY:F. SMITH, J. RENNER

NAME: MT HOOD • OR

INPUT RECORD # 249 MIRRORED ON 3/76
NAME: CAREY OR AUSTIN H.S. ,OR RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 6 NUMBER: 004 DATE: 12/74

LOCATION:

STATE: OR COUNTY: CLACKAMAS
LATITUDE: 45 1.20 TOWNSHIP: 06S
LONGITUDE: 122 0.60 RANGE: 07E
ELEV: 1650 SECTION: 30 , 1/4 NW1/4 B&M: WIL

SURFACE MANIFESTATIONS: HOT SPRING(S),

ROCK AND STRUCTURE TYPE: OLIVINE BASALT, BASALTIC ANDESITE, PYROXENE ANDESITE

SURFACE DISCHARGE TOTAL: 950.0 L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.1 KM**2
APPROX. # OF HOT SPRINGS: SEVERAL

TEMPERATURE: RANGE OF SPRING TEMP. 86 C TO

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HCO3
86	0.0	7.63	81.00	300.00	7.10	35.00	140.0	430.0	56

OTHER CHEMICAL DATA B 2.6; MG 0.1; LI 0.4; F 1.4

SI02	SI02	SI02	NA_K_CA	OTHER
ADIAHATIC	CONDUCTIVE	CHALCEDONY	1/3	NA-K
123.0	126.2	96.4	117.8	61
			4/3	61
			87.4	

RESERVOIR PROPERTIES

RANGE IN RES TEMP 90 C TO 130 C ASSUMED

BEST EST. AVER. TEMP 125.0

AREA 0.1 TO 6.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.70 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 1.30 KM; BEST ESTIMATE 1.50 KM.

VOLUME 0.10 TO 7.80 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.00 TO 0.54 E18 CAL; BEST ESTIMATE 0.15 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS: WATER USED FOR BATHING

REFERENCÉS: MARINER AND OTHERS, 1974; WARING, 1965; PECK AND OTHERS, 1964

TOPO MAPS: FISH CREEK MTN. 1:62,500, VANCOUVER 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

PREPARED BY: F. SMITH, J. RENNER

NAME: CAREY OR AUSTIN H.S. , OR

INPUT RECORD # 250 MIRRORED ON 3/76
NAME: KAHNEETAH H.S. OR RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 01/75

LOCATION:
STATE: 0? COUNTY: WASCO
LATITUDE: 44 51.90 TOWNSHIP: 08S
LONGITUDE: 121 12.90 RANGE: 13E
ELEV: 1470 SECTION: 20 . 1/4 1/4 8&M: WIL
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: RHYOLITE, ANDESITE, BASALT, TUFFS
SURFACE DISCHARGE TOTAL: 200.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP. 52 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER AND OTHERS, 1974
SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
52	0.0	8.32	104.00	325.00	3.40	3.20	34.0	155.0	493

OTHER CHEMICAL DATA B 2.6; MG <0.05; LI 0.52; F 21

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
134.6	139.8	111.6	102.6	120.5
				17

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 145 C ASSUMED

BEST EST. AVER. TEMP 140.0

AREA 0.2 TO 6.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.50 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.50 KM; BEST ESTIMATE 1.50 KM.

VOLUME 0.20 TO 15.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.01 TO 1.12 E18 CAL; BEST ESTIMATE 0.17 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; WATERS, 1968A

TOPO MAPS: EAGLE BUTTE 1:24,000; BEND ORE 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

PREPARED BY: F. SMITH, J. RENNER

NAME: KAHNEETAH H.S. OR

303

INPUT RECORD # 251 MIRRORED ON 3/76
NAME: BREITENBUSH HOT SPRINGS .OR RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARNING FIG: 6 NUMBER: 006 DATE: 04/75
LOCATION:

STATE: OR COUNTY: MARION
LATITUDE: 44 46.86 TOWNSHIP: 09S
LONGITUDE: 121 58.54 RANGE: 07E
ELEV: 0 SECTION: 20 .NE1/4 1/4 B&M: WIL
SURFACE MANIFESTATIONS: HOT SPRING(S),

ROCK AND STRUCTURE TYPE: ANDESITE
SURFACE DISCHARGE TOTAL: 3400.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.1 KM**2
APPROX. # OF HOT SPRINGS: 60

TEMPERATURE: RANGE OF SPRING TEMP. 92 C TO

MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP, C AT M DEPTH
CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER AND OTHERS, 1974

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
92	0.0	7.3	83.00	720.00	31.00	100.00	140.0	1300.0	142

OTHER CHEMICAL DATA B=4.1; MG=1.3; LI=1.8; F=3.4

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
124.1	127.5	97.9	148.9	128.0
				103

RESERVOIR PROPERTIES

RANGE IN RES TEMP 125 C TO 155 C ASSUMED

BEST EST. AVER. TEMP 150.0

AREA 2.0 TO 6.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 2.00 TO 12.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.15 TO 0.90 E18 CAL; BEST ESTIMATE 0.18 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; WARING, 1965; PECK AND OTHERS, 1964

TOPO MAPS: BREITENBUSH HOT SPRINGS, ORE 1:62,500, BEND, ORE 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

RESORT

PREPARED BY: F. SMITH, J. RENNER

NAME: BREITENBUSH HOT SPRINGS . OR

304

INPUT RECORD # 252 MIRRORED ON 3/76
NAME: BELKNAP HOT SPRING ,OR RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 6 NUMBER: 018 DATE: 01/75

LOCATION:

STATE: OR COUNTY: LANE
LATITUDE: 44 11.62 TOWNSHIP: 16S
LONGITUDE: 122 3.19 RANGE: 06E
ELEV: 2700 SECTION: 11 .SE1/4 NW1/4 B&M: WIL

SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: OLIVINE BASALT
SURFACE DISCHARGE TOTAL: 300.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 3

TEMPERATURE: RANGE OF SPRING TEMP. 71 C TO

MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH
CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
71	0.0	7.62	96.00	690.00	15.00	210.00	170.0	1300.0	17

OTHER CHEMICAL DATA B=6.4;MG=0.2;LI=0.95;F=1.2

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY		NA-K
130.8	135.3	106.6	113.6	56

RESERVOIR PROPERTIES

RANGE IN RES TEMP 80 C TO 145 C ASSUMED

BEST EST. AVER. TEMP 140.0

AREA 0.1 TO 50.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.50 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.50 KM; BEST ESTIMATE 1.50 KM.

VOLUME 0.10 TO 125.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.01 TO 7.50 E18 CAL; BEST ESTIMATE 0.17 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO DARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS: RESORT

REFERENCES: MARINER AND OTHERS, 1974; WARING, 1965; PECK AND OTHERS, 1964

TOPO MAPS: MCKENZIE BRIDGE, ORE 1:62,500, SALEM, ORE 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

WATER USED FOR BATHING

PREPARED BY: F. SMITH, J. RENNER

NAME: BELKNAP HOT SPRING . OR

W
O
R

INPUT RECORD # 253 MIRRORED ON 3/76
NAME: KLAMATH FALLS, OR RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 6 NUMBER: 027 DATE: 01/75

LOCATIONS:

STATE: OR COUNTY: KLAMATH
LATITUDE: 42 15.00 TOWNSHIP: 38S
LONGITUDE: 121 45.00 RANGE: 09E
ELEV: 5000 SECTION: 21, SW1/4 1/4 H&M: WIL
SURFACE MANIFESTATIONS: SINTER, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: PLEISTOCENE VOLCANICS, LAKE BED SEDIMENTS

SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: NUMEROUS

TEMPERATURE: RANGE OF SPRING TEMP.
MAX. WELL TEMP 115 C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER AND OTHERS, 1974

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HCO3
74	200.0	7.70	98.00	190.00	7.20	40.00	400.0	59.0	53

OTHER CHEMICAL DATA SPRING ANALYSIS FROM SPRING AT OLENE GAP

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
131.8	136.4	107.9	130.1	79.8

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 125 C ASSUMED
BEST EST. AVER. TEMP 120.0
AREA 125.0 TO 950.0 KM**2; BEST ESTIMATE 240.0 KM**2
BASED ON GEOLOGY, THERMAL WELLS, HOT SPRINGS
DEPTH TO TOP OF RES. 0.50 KM TO 2.00 KM; BEST ESTIMATE 1.00 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.50 KM; BEST ESTIMATE 2.00 KM.
VOLUME 125.00 TO 2400.00 KM**3; BEST ESTIMATE 480.00 KM**3
HEAT CONTENT > 15 C 6.40 TO 160.00 E18 CAL; BEST ESTIMATE 30.00 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS: NUMEROUS SHALLOW WELLS USED FOR DOMESTIC HEATING, TEMPS 60 TO 150C
REFERENCES: MARINER AND OTHERS, 1974; PETERSON AND GROM, 1967; PETERSON AND MCINTYRE, 1970

TOPO MAPS: KLAMATH FALLS I:62,500

SPRING IDENTIFIED:

COMMENTS:

BOUNDED BY AREA OF ABOUT 19 X 48 KM. IN NEAR SURFACE (UPPER KM) APPEARS TO BE ASSOCIATED CLOSELY WITH FAULTS.
APPROXIMATELY 140 KM OF FAULT TRACES MAY EXIST IN AREA, GRADIENT DATA SUGGESTS 100C/KM IN THERMAL AREA.

PREPARED BY: J. RENNER, F. SMITH

NAME: KLAMATH FALLS, OR

306

INPUT RECORD # 254 MIRRORED ON 3/76
NAME: SUMMER LAKE HOT SPRING .OR RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 6 NUMBER: 042 DATE: 01/75

LOCATION:

STATE: OR COUNTY: LAKE
LATITUDE: 42 43.48 TOWNSHIP: 33S
LONGITUDE: 120 38.73 RANGE: 17E
ELEV: 4285 SECTION: 12 .NE1/4 1/4 BSM: WIL
SURFACE MANIFESTATIONS: SINTER, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: ALLUVIUM, ANDESITE, ANDESITIC TUFF-BRECCIA
SURFACE DISCHARGE TOTAL: 75.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 3

TEMPERATURE: RANGE OF SPRING TEMP. 43 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
43	0.0	8.43	94.00	390.00	4.60	2.10	120.0	280.0	406

OTHER CHEMICAL DATA B=6.9, MG=2.1, LI=0.15, F=2.2

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
129.8	134.1	105.3	112.2	148.7
				22

RESERVOIR PROPERTIES

RANGE IN RES TEMP 110 C TO 150 C ASSUMED
BEST EST. AVER. TEMP 140.0
AREA 0.5 TO 8.0 KM**2; BEST ESTIMATE 4.0 KM**2
BASED ON
DEPTH TO TOP OF RES. 0.50 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.50 KM; BEST ESTIMATE 1.50 KM.
VOLUME 0.50 TO 20.00 KM**3; BEST ESTIMATE 6.00 KM**3
HEAT CONTENT > 15 C 0.03 TO 1.62 E18 CAL; BEST ESTIMATE 0.45 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; WARING, 1965; WALKER, 1963

TOPO MAPS: SLIDE MTN., ORE 1:24,000, KLAMATH FALLS, ORE 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

WATER USED FOR BATHING AND IRRIGATION; SMELLS OF H2S. MIXED WATERS. ALSO MAY HAVE CHALCEDONY SILICA EQUILIBRIUM

PREPARED BY: F. SMITH, J. RENNER

NAME: SUMMER LAKE HOT SPRING . OR

307

INPUT RECORD # 255 MIRRORED ON 3/76
NAME: RADIUM H. S. OR RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 6 NUMBER: 17A DATE: 01/75

LOCATION:

STATE: 07 COUNTY: BAKER
LATITUDE: 44 55.80 TOWNSHIP: 07S
LONGITUDE: 117 56.40 RANGE: 39E
ELEV: 3310 SECTION: 28, 1/4 NE 1/4 B&M: WIL
SURFACE MANIFESTATIONS: HOT SPRING(S),

ROCK AND STRUCTURE TYPE: ALLUVIUM, QUARTZ DIORITE, BASALT
SURFACE DISCHARGE TOTAL: 1100.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 2

TEMPERATURE: RANGE OF SPRING TEMP. 58 C TO

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP, C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
58	1100.0	9.56	78.00	58.00	1.10	1.50	34.0	17.0	86

OTHER CHEMICAL DATA B 0.42; MG 0.1; LI 0.01; F 1.3 SAMPLE FROM FLOWING WELL

ADIABATIC	SI02	CONDUCTIVE	SI02	CHALCEDONY	NA_K_CA	OTHER
121.4		124.2	94.2	108.2	1/3 4/3	NA+K 48

RESERVOIR PROPERTIES

RANGE IN RES TEMP 75 C TO 135 C ASSUMED

BEST EST. AVER. TEMP 130.0

AREA 0.5 TO 3.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.50 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.50 KM; BEST ESTIMATE 1.50 KM.

VOLUME 0.50 TO 7.50 KM**3; BEST ESTIMATE 2.20 KM**3

HEAT CONTENT > 15 C 0.02 TO 0.52 E18 CAL; BEST ESTIMATE 0.16 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDANCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS: WATER USED FOR BATHING

REFERENCES: MARINER AND OTHERS, 1974; WARING, 1965; WALKER, 1973

TOPO MAPS: HAINES ORE 1:24,000; BAKER, ORE 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

PREPARED BY: F. SMITH, J. RENNER

NAME: RADIUM H. S. OR

308

INPUT RECORD # 256 MIRRORED ON 3/76
NAME: HOT LAKE ,OR RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 6 NUMBER: 011 DATE: 01/75

LOCATION:

STATE: OR COUNTY: UNION
LATITUDE: 45 14.62 TOWNSHIP: 04S
LONGITUDE: 117 57.63 RANGE: 39E
ELEV: 2700 SECTION: 5 ,SE1/4 NW1/4 B6M: WIL
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: BASALT & MYLONITE
SURFACE DISCHARGE TOTAL: 1500.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 1

TEMPERATURE: RANGE OF SPRING TEMP. 80 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03
80	0.0	9.21	48.00	130.00	2.70	4.90	56.0	140.0	75

OTHER CHEMICAL DATA B=2.9; MG=<0.1; LI=0.03; F =1.7

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	NA-K
100.9	100.4	68.2	114.5	53

RESERVOIR PROPERTIES

RANGE IN RES TEMP 90 C TO 125 C ASSUMED
BEST EST. AVER. TEMP 120.0
AREA 0.5 TO 3.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 0.50 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.50 KM; BEST ESTIMATE 1.50 KM.
VOLUME 0.50 TO 7.50 KM**3; BEST ESTIMATE 2.20 KM**3
HEAT CONTENT > 15 C 0.02 TO 0.47 E18 CAL; BEST ESTIMATE 0.14 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; WARING, 1965; WALKER, 1973

TOPO MAPS: CRAIG MTN., ORE 1:24,000, GRANGEVILLE, IDAHO - ORE.-WASH 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

WATER USED FOR BATHING

PREPARED BY: F. SMITH, J. RENNER

NAME: HOT LAKE , OR

309

INPUT RECORD # 257 MIRRORED ON 3/76
NAME: MEDICAL HOT SPRINGS, OR RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 6 NUMBER: 012 DATE: 12/74

LOCATION:

STATE: OR COUNTY: UNION
LATITUDE: 45 1.07 TOWNSHIP: 06S
LONGITUDE: 117 37.52 RANGE: 41E
ELEV: 3475 SECTION: 25, NE1/4 1/4 B&M: WIL
SURFACE MANIFESTATIONS: HOT SPRING(S),

ROCK AND STRUCTURE TYPE: BASALT
SURFACE DISCHARGE TOTAL: 280.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 2

TEMPERATURE: RANGE OF SPRING TEMP. 60 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP, C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW
TEMP L/MIN PH SI02 NA K CA SO4 CL HCO3
60 0.0 8.23 80.00 190.00 7.00 72.00 400.0 77.0 26

OTHER CHEMICAL DATA B=2.2; MG=0.2; LI=0.05; F=1.2

SI02 ADIABATIC 122.5
SI02 CONDUCTIVE 125.5
SI02 CHALCEDONY 95.7
NA_K_CA 1/3 4/3 124.7 66.5
OTHER NA-K 91

RESERVOIR PROPERTIES

RANGE IN RES TEMP 60 C TO 135 C ASSUMED
BEST EST. AVER. TEMP 130.0
AREA 0.1 TO 6.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 0.50 KM TO 2.50 KM; BEST ESTIMATE 1.50 KM,
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM,
THICKNESS 0.50 TO 2.50 KM; BEST ESTIMATE 1.50 KM,
VOLUME 0.05 TO 15.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.00 TO 1.03 E18 CAL; BEST ESTIMATE 0.15 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; WARING, 1965; WALKER, 1973

TOPO MAPS: MEDICAL SPRINGS, ORE. 1:24,000; GRANGEVILLE, IDAHO, ORE - WASH 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

WATER USED LOCALLY

PREPARED BY: F. SMITH, J. RENNER

NAME: MEDICAL HOT SPRINGS, OR

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INPUT RECORD # 258 MIRRORED ON 3/76
NAME: RITTER H.S. OR RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 6 NUMBER: 013 DATE: 01/75

LOCATION:

STATE: OR COUNTY: GRANT
LATITUDE: 44 53.70 TOWNSHIP: 08S
LONGITUDE: 119 8.60 RANGE: 30E
ELEV: 2540 SECTION: 8, 1/4 NW1/4 H&M: WIL
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: BASALT (FAULTED COLUMBIA RIVER BASALT GROUP)

SURFACE DISCHARGE TOTAL: 130.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 1

TEMPERATURE: RANGE OF SPRING TEMP. 41 C TO

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
41	0.0	9.68	70.00	72.00	0.82	1.40	9.0	29.0	86

OTHER CHEMICAL DATA B 2.6; MG <0.05; LI 0.01; F 4.0

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
116.6	118.6	88.1	92.5	71.4
				20

RESERVOIR PROPERTIES

RANGE IN RES TEMP 70 C TO 130 C ASSUMED

BEST EST. AVER. TEMP 125.0

AREA 0.5 TO 2.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.50 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 0.50 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 0.25 TO 4.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.01 TO 0.20 E18 CAL; BEST ESTIMATE 0.15 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS: RESORT

REFERENCES: MARINER AND OTHERS, 1974; WARING, 1965; BROWN AND THAYER, 1966

TOPO MAPS: RITTER, ORE. 1:62,500, CANYON CITY, ORE. 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

PREPARED BY: F. SMITH, J. RENNER

NAME: RITTER H.S. OR

INPUT RECORD # 259 MIRRORED ON 3/76
NAME: FISHER HOT SPRINGS, OR RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 6 NUMBER: 49A DATE: 04/75
LOCATION:

STATE: OR COUNTY: LAKE
LATITUDE: 42 17.86 TOWNSHIP: 38S
LONGITUDE: 119 46.54 RANGE: 25E
ELEV: 4540 SECTION: 10 NW1/4 NW1/4 B&M: WIL
SURFACE MANIFESTATIONS: HOT SPRING(S):

ROCK AND STRUCTURE TYPE: ALLUVIUM, OLIVINE BASALT
SURFACE DISCHARGE TOTAL: 70.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP. 68 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER AND OTHERS, 1978

TEMP	L/MIN	PH	SI02	NA	R	CA	SO4	CL	HCO3
68	0.0	7.93	77.00	92.00	7.20	8.40	59.0	56.0	105

OTHER CHEMICAL DATA B=2.2; MG=1.0; LI=0.04; F=3.5

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	NA=K
120.8	123.5	93.5	164.7	167

RESERVOIR PROPERTIES

RANGE IN RES TEMP 110 C TO 150 C ASSUMED

BEST EST. AVER. TEMP 130.0

AREA 0.5 TO 8.0 KM**2; BEST ESTIMATE 3.0 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.50 KM TO 2.00 KM; BEST ESTIMATE 1.90 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.50 KM; BEST ESTIMATE 1.50 KM.

VOLUME 0.50 TO 15.00 KM**3; BEST ESTIMATE 4.50 KM**3

HEAT CONTENT > 15 C 0.03 TO 1.21 E18 CAL; BEST ESTIMATE 0.31 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; WARNING, 1965; WALKER AND REPENNING, 1965

TOPO MAPS: CRUMP LAKE, ONE 1:24,000; ADEL, ONE, 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

WATER USED FOR BATHING; SMELLS OF H2S

PREPARED BY: F. SMITH, J. RENNER

NAME: FISHER HOT SPRINGS, OR

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INPUT RECORD # 260 MIRRORED ON 3/76
NAME: BLUE MTN H.S. OR RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 6 NUMBER: 016 DATE: 01/75

LOCATION:

STATE: OR COUNTY: GRANT
LATITUDE: 44 21.30 TOWNSHIP: 14S
LONGITUDE: 118 34.40 RANGE: 34E
ELEV: 4242 SECTION: 13 NW1/4 SE1/4 B&M: WIL
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: ANDESITE
SURFACE DISCHARGE TOTAL: 250.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: SEVERAL

TEMPERATURE: RANGE OF SPRING TEMP. 58 C TO

MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW
TEMP L/MIN PH SI02 NA K CA SO4 CL HCO3
58 0.0 7.96 47.00 140.00 3.30 2.20 11.0 15.0 323

OTHER CHEMICAL DATA BI.6; MG 0.2; LI 0.07; F 10.6

SI02 SI02 SI02 NA_K_CA OTHER
ADIABATIC CONDUCTIVE CHALCEDONY 1/3 4/3 NA-K
100.1 99.5 67.1 126.1 118.0 61

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 140 C ASSUMED

BEST EST. AVER. TEMP 130.0

AREA 0.5 TO 5.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.50 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.50 KM; BEST ESTIMATE 1.50 KM.

VOLUME 0.50 TO 12.50 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.02 TO 0.94 E18 CAL; BEST ESTIMATE 0.15 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS: WATER USED LOCALLY

REFERENCES: MARINER AND OTHERS, 1974; WARING, 1965; BROWN AND THAYER, 1966

TOPO MAPS: PRAIRIE CITY, ORE. 1:62,500; CANYON CITY, ORE. 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

PREPARED BY: F. SMITH, J. RENNER

NAME: BLUE MTN H.S. OR

INPUT RECORD # 261 MIRRORED ON 3/76
NAME: UNNAMED (NEAR LITTLE VALLEY) .OR RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WAKING FIG: 6 NUMBER: 076 DATE: 01/75

LOCATION:

STATE: OR COUNTY: MALHEUR
LATITUDE: 43 53.48 TOWNSHIP: 19S
LONGITUDE: 117 30.00 RANGE: 43E
ELEV: 2480 SECTION: 30 .NW1/4 1/4 8&M: WIL
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: BASALT & ANDESITE
SURFACE DISCHARGE TOTAL: 550.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: SEVERAL

TEMPERATURE: RANGE OF SPRING TEMP. 70 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW
TEMP L/MIN PH SIO2 NA K CA SO4 CL HCO3
70 0.0 8.71 115.00 160.00 3.20 3.20 110.0 74.0 127

OTHER CHEMICAL DATA B=4.7; MG<.05; LI=0.11; F=6.8

SIO2 SIO2 SIO2 NA_K_CA OTHER
ADIABATIC CONDUCTIVE CHALCEDONY 1/3 4/3 NA-K
139.4 145.5 118.1 108.7 51

RESERVOIR PROPERTIES

RANGE IN RES TEMP 110 C TO 160 C ASSUMED

BEST EST. AVER. TEMP 150.0

AREA 0.5 TO 6.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.75 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.25 KM; BEST ESTIMATE 1.50 KM.

VOLUME 0.50 TO 13.25 KM**3; BEST ESTIMATE 2.20 KM**3

HEAT CONTENT > 15 C 0.03 TO 1.15 E18 CAL; BEST ESTIMATE 0.18 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/MR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; WARING, 1965; WALKER, 1973

TOPO MAPS: HARPER, ORE, 1:62,500; BOISE, IDAHO-ORE, 1:250,000

SPRING IDENTIFIED: NO

COMMENTS:

PREPARED BY: F. SMITH, J. RENNER

NAME: UNNAMED (NEAR LITTLE VALLEY) , OR

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INPUT RECORD # 262 MIRRORED ON 3/76
NAME: BEULAH H.S. OR RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 01/75
LOCATION:

STATE: OR COUNTY: MALHEUR
LATITUDE: 43 56.70 TOWNSHIP: 19S
LONGITUDE: 118 8.20 RANGE: 37E
ELEV: 3350 SECTION: 2, 1/4 SE 1/4 8&M: WIL
SURFACE MANIFESTATIONS: SINTER, TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: VITRIC TUFF
SURFACE DISCHARGE TOTAL: 50.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP. 60 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER, AND OTHERS, 1974

SPRING FLOW
TEMP L/MIN PH SIO2 NA K CA SO4 CL HCO3
60 0.0 7.56 170.00 200.00 6.00 24.00 290.0 55.0 161

OTHER CHEMICAL DATA B 4.7; MG 0.2; LI 0.24; F 4.7

SIO2	SIO2	SIO2	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	NA-K
159.3	169.3	145.5	4/3	76
			85.6	

RESERVOIR PROPERTIES

RANGE IN RES TEMP 100 C TO 150 C ASSUMED
BEST EST. AVER. TEMP 130.0
AREA 2.0 TO 14.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 2.00 TO 28.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.14 TO 1.93 E18 CAL; BEST ESTIMATE 0.15 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO DARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; GREENE AND OTHERS, 1972

TOPO MAPS: BEULAH, ORE. 1:62,500; BURNS, ORE. 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

PREPARED BY: F. SMITH, J. RENNER

NAME: BEULAH H.S. OR

INPUT RECORD # 263 MIRRORED ON 3/76
NAME: UNNAMED (NEAR RIVERSIDE) .OR RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARNING FIG: 6 NUMBER: 084 DATE: 00/00
LOCATION:

STATE: OR COUNTY: MALHEUR
LATITUDE: 43 27.97 TOWNSHIP: 24S
LONGITUDE: 118 11.29 RANGE: 37E
ELEV: 3600 SECTION: 20 . 1/4 1/4 B&M: WIL
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: ANDESITE
SURFACE DISCHARGE TOTAL: 200.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP. 63 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER AND OTHERS, 1974
SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HCO3
63	0.0	7.43	110.00	240.00	9.70	34.00	290.0	140.0	160

OTHER CHEMICAL DATA B=6.6; MG=0.5; LI=0.27; F=4.8

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	NA-K
137.2	142.9	115.2	137.5	96.4
				98

RESERVOIR PROPERTIES

RANGE IN RES TEMP 125 C TO 160 C ASSUMED

BEST EST. AVER. TEMP 150.0

AREA 0.5 TO 3.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 1.00 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 0.50 TO 6.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.03 TO 0.52 E18 CAL; BEST ESTIMATE 0.18 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS: HEAT FLOW

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; GREENE AND OTHERS, 1972; WARNING, 1965

TOPO MAPS: BURNS, ORE. 1:250,000

SPRING IDENTIFIED: NO

COMMENTS:

WATER USED FOR IRRIGATION

PREPARED BY: F. SMITH, J. RENNER

NAME: UNNAMED (NEAR RIVERSIDE) .OR

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INPUT RECORD # 264 MIRRORED ON 3/76
NAME: CRANE HOT SPRINGS .OR RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 6 NUMBER: 053 DATE: 01/75

LOCATION:
STATE: OR COUNTY: HARNEY
LATITUDE: 43 26.43 TOWNSHIP: 24S
LONGITUDE: 118 38.35 RANGE: 33E
ELEV: 4110 SECTION: 34 .SW1/4 NE1/4 H&M: WIL
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: ANDESITE
SURFACE DISCHARGE TOTAL: 550.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 2

TEMPERATURE: RANGE OF SPRING TEMP. 78 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER AND OTHERS, 1974
SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
78	0.0	8.10	83.00	170.00	3.90	3.70	86.0	79.0	202

OTHER CHEMICAL DATA B=7.9; F=9.0; LI=.09; MG=0.1

SI02	ADIABATIC	SI02	CONDUCTIVE	SI02	CHALCEDONY	NA_K_CA	OTHER
124.1	124.1	127.5	127.5	97.9	97.9	124.1	59

RESERVOIR PROPERTIES

RANGE IN RES TEMP 115 C TO 135 C ASSUMED
BEST EST. AVER. TEMP 130.0
AREA 0.5 TO 10.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 0.50 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.50 KM; BEST ESTIMATE 1.50 KM.
VOLUME 0.50 TO 25.00 KM**3; BEST ESTIMATE 2.20 KM**3
HEAT CONTENT > 15 C 0.03 TO 1.80 E18 CAL; BEST ESTIMATE 0.15 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; WARING, 1965; GREENE AND OTHERS, 1972

TOPO MAPS: CRANE, ORE. 1:62,500; BURNS, ORE. 1:250,000

SPRING IDENTIFIED: YES

COMMENTS:

PREPARED BY: F. SMITH, J. RENNER

NAME: CRANE HOT SPRINGS . OR

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INPUT RECORD # 265 MIRRORED ON 3/76
NAME: HARNEY LAKE, OR RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 6 NUMBER: 064 DATE: 01/75
LOCATION:

STATE: OR COUNTY: HARNEY
LATITUDE: 43 10.90 TOWNSHIP: 27S
LONGITUDE: 119 6.20 RANGE: 29.
ELEV: 4100 SECTION: 36, 1/4 1/4 8&M: WIL
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: BASALTIC TUFF, OLIVINE BASALT (NOTE: T27S R29.5E NOT R29E.)
SURFACE DISCHARGE TOTAL: 550.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP. 68 C TO

MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH
CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER AND OTHERS, 1974

TEMP	L/MIN	PH	SI02	NA	K	CA	S04	CL	HC03
68	0.0	7.26	92.00	630.00	13.00	12.00	140.0	590.0	566

OTHER CHEMICAL DATA B 11.3; MG 1.8; LI 0.45; F 3.3
SI02 NA_K_CA OTHER
ADIABATIC CONDUCTIVE CHALCEDONY 1/3 4/3 NA-K
128.8 133.0 104.0 129.8 150.4 52

RESERVOIR PROPERTIES

RANGE IN RES TEMP 120 C TO 150 C ASSUMED

BEST EST. AVER. TEMP 135.0

AREA 1.0 TO 20.0 KM**2; BEST ESTIMATE 3.0 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.50 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.50 KM; BEST ESTIMATE 1.50 KM.

VOLUME 1.00 TO 50.00 KM**3; BEST ESTIMATE 4.50 KM**3

HEAT CONTENT > 15 C 0.06 TO 4.05 E18 CAL; BEST ESTIMATE 0.32 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; WARING, 1965; GREENE AND OTHERS, 1972

TOPO MAPS: BURNS, ORE. 1:250,000

SPRING IDENTIFIED: NO

COMMENTS:

PREPARED BY: F. SMITH, J. RENNER

NAME: HARNEY LAKE, OR

3/8

INPUT RECORD # 266 MIRRORED ON 3/76
NAME: TROUT CREEK ,OR RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARNING FIG: 6 NUMBER: 072 DATE: 01/75

LOCATION:

STATE: OR COUNTY: HARNEY
LATITUDE: 42 11.30 TOWNSHIP: 39S
LONGITUDE: 118 9.20 RANGE: 37E
ELEV: 5700 SECTION: 16 , 1/4 1/4 8&M: WIL
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: ANDESITE, BASALT, RHYOLITE, TUFFS AT DEPTH?

SURFACE DISCHARGE TOTAL: 200.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: SEVERAL

TEMPERATURE: RANGE OF SPRING TEMP. 52 C TO

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
52	0.0	6.77	105.00	270.00	10.80	18.00	204.0	24.0	0

OTHER CHEMICAL DATA B 0.89; MG 0.8; LI 0.68; F 12.8

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
135.0	140.3	112.3	143.5	118.2
				97

RESERVOIR PROPERTIES

RANGE IN RES TEMP 130 C TO 150 C ASSUMED

BEST EST. AVER. TEMP 145.0

AREA 0.5 TO 5.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.50 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 1.00 TO 2.50 KM; BEST ESTIMATE 1.50 KM.

VOLUME 0.50 TO 12.50 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.03 TO 1.01 E18 CAL; BEST ESTIMATE 0.17 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS: WATER SUPPLY FOR CATTLE

REFERENCES: MARINER AND OTHERS, 1974; WARING, 1965; WALKER AND REPENNING, 1965

TOPO MAPS: ADEL, ORE. 1:250,000

SPRING IDENTIFIED:NO

COMMENTS:

PREPARED BY:F. SMITH, J. RENNER

NAME: TROUT CREEK , OR

INPUT RECORD # 267 MIRRORED ON 3/76
NAME: MC DERMITT .OR RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARNING FIG: 6 NUMBER: 096 DATE: 01/75

LOCATION:

STATE: OR COUNTY: MALHEUR
LATITUDE: 42 4.10 TOWNSHIP: 40S
LONGITUDE: 117 30.00 RANGE: 42E
ELEV: 6200 SECTION: 25 , 1/4 1/4 8&M: WIL
SURFACE MANIFESTATIONS: HOT SPRING(S),

ROCK AND STRUCTURE TYPE: FAULTED BASALT
SURFACE DISCHARGE TOTAL: 750.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CALYSEC
AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS:
TEMPERATURE: RANGE OF SPRING TEMP. 52 C TO
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: MARINER AND OTHERS, 1974

SPRING FLOW
TEMP L/MIN PH SI02 NA K CA SO4 CL HCO3
52 0.0 8.79 72.00 130.00 1.00 0.60 52.0 14.0 237

OTHER CHEMICAL DATA BI.1; MG <.1; LI .06; F 6.6

SI02 SI02 SI02 NA_K_CA OTHER
ADIABATIC CONDUCTIVE CHALCEDONY 1/3 4/3
117.4 120.1 89.7 90.6 104.3

RESERVOIR PROPERTIES

RANGE IN RES TEMP 90 C TO 125 C ASSUMED
BEST EST. AVER. TEMP 120.0
AREA 0.5 TO 10.0 KM**2; BEST ESTIMATE 2.0 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.50 KM TO 2.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 1.00 TO 2.50 KM; BEST ESTIMATE 1.50 KM.
VOLUME 0.50 TO 25.00 KM**3; BEST ESTIMATE 3.00 KM**3
HEAT CONTENT > 15 C 0.02 TO 1.65 E10 CAL; BEST ESTIMATE 0.19 E10 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MARINER AND OTHERS, 1974; WALKER AND REPENNING, 1966; WARING, 1965

TOPO MAPS: JORDAN VALLEY, ORE. 1:250,000

SPRING IDENTIFIED: NO

COMMENTS:

PREPARED BY: F. SMITH, J. RENNER

NAME: MC DERMITT .OR

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____ 1968b, Reconnaissance geologic map of the Dufur quadrangle, Hood River, Sherman and Wasco Counties, Oregon: U.S. Geol. Survey Misc. Geol. Inv. Map I-556.

Selected Geothermal Resources Assessment Data

Hydrothermal Convection Systems in Utah

**By: J. L. Renner and G. L. Galyardt,
Denver, Colorado**

Contents

Hot-Spring Data Sheets

Hot water greater than 150°C

Hot water from 90° to 150°C

References

INPUT RECORD # 268 MIRRORED ON 3/76
NAME: ROOSEVELT HOT SPRING .UT RESOURCE CATAGORY: HOT WATER > 150 C
WARING-FIG: 7 NUMBER: 51 DATE: 04/75
LOCATION:

STATE: UT COUNTY: HEAVER
LATITUDE: 38 30.00 TOWNSHIP: 27S
LONGITUDE: 112 50.00 RANGE: 09W
ELEV: 5200 SECTION: 3 .NW1/4 1/4 B&M: SALT LAKE
SURFACE MANIFESTATIONS: SINTER.

ROCK AND STRUCTURE TYPE: PRECAMBRIAN GRANITE AND PLIOCENE OR PLEISTOCENE VOLCANICS

SURFACE DISCHARGE TOTAL: L/MIN

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE Ex: 0.0 KM**2

APPROX. # OF HOT SPRINGS: NONE PRESENTLY

TEMPERATURE: RANGE OF SPRING TEMP. 55 C TO 88 C OR

MAX. WELL TEMP 132 C AT M DEPTH

BOTTOM HOLE TEMP. C AT 85 M DEPTH

CHEMICAL DATA ANALYSIS DATE 09/57 SOURCE: MUNDORFF, 1970

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
55	0.0	0.00	313.00	2500.00	488.00	22.00	73.0	4240.0	156

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
144.5	212.6	196.9	283.8	445.8

RESERVOIR PROPERTIES

RANGE IN RES TEMP 0 C TO 0 C ASSUMED

BEST EST. AVER. TEMP 230.0

AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 4.0 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.00 KM.

DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 2.00 KM.

VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 8.00 KM**3

HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 1.00 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS: ONE SHALLOW WELL ABANDONED BECAUSE OF PROBLEMS; PHILLIPS CURRENTLY DRILLING EXPLORATION WE

REFERENCES: WARING, 1965; MUNDORFF, 1970; PETERSEN, 1973; PETERSON, 1974 (M.S. THESIS UNIV. UTAH)

TOPO MAPS: RICHFIELD 1:250,000

SPRING IDENTIFIED:NO

COMMENTS:

ACCORDING TO PETERSON HOT SPRINGS WERE ACTIVE DURING PLEISTOCENE. MUNDORFF REPORTS FROM EARLY 1900 TO ABOUT 1960 THE SPRING FLOW DECREASED ABOUT 10 FOLD AND CONCENTRATION INCREASED ABOUT 10 FOLD. EXTENSIVE SINTER DEPOSIT S SCATTERED ALONG 4.8 KM LINEAR TREND, AREA AND VOLUME MAY BE MUCH LARGER. OLD WELL REPORTED 132C FLOWING TEMP.

PREPARED BY: J. RENNER

NAME: ROOSEVELT HOT SPRING .UT

325

INPUT RECORD # 269 MIRRORED ON 3/76
NAME: COVE FORT - SULPHURDALE ,UT RESOURCE CATAGORY: HOT WATER > 150 C
WARNING FIG: NUMBER: DATE: 06/75

LOCATION:
STATE: UT COUNTY: MILLARD (& HEAVEN)
LATITUDE: 38 36.00 TOWNSHIP: 25S
LONGITUDE: 112 33.00 RANGE: 06W
ELEV: 6400 SECTION: 32 , 1/4 1/4 B&M: SALT LAKE
SURFACE MANIFESTATIONS: FUMAROLE OR WARM VAPOR.

ROCK AND STRUCTURE TYPE: PALEOZOIC SEDIMENTS, TERTIARY VOLCANICS
SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: NONE
TEMPERATURE: RANGE OF SPRING TEMP.
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH
CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: LEE, 1907
TEMP L/MIN PH SI02 NA K CA SO4 CL HCO3
0 0.0 0.00 124.00 0.00 0.00 158.00 7602.0 79.0 0
OTHER CHEMICAL DATA NA+K = 144; FREE S=3.6
SI02 SI02 SI02 NA_K_CA OTHER
ADIABATIC CONDUCTIVE CHALCEDONY 1/3 4/3
143.1 149.9 123.1 0.0 0.0

RESERVOIR PROPERTIES
RANGE IN RES TEMP 100 C TO 240 C ASSUMED
BEST EST. AVER. TEMP 200.0
AREA 12.0 TO 75.0 KM**2; BEST ESTIMATE 15.0 KM**2
BASED ON OCCURRENCE OF SULFUR DEPOSITS
DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 18.00 TO 112.50 KM**3; BEST ESTIMATE 22.50 KM**3
HEAT CONTENT > 15 C 1.00 TO 15.00 E18 CAL; BEST ESTIMATE 2.50 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:
DEVELOPMENTS:
REFERENCES: GEOLOGIC MAP OF SOUTHWESTERN UTAH; HINTZE, L.F., 1963; LEE, 1907; RODRIGUEZ, 1960

TOPO MAPS: COVE FORT 1:62,500

SPRING IDENTIFIED:NO
COMMENTS:

6 PRINCIPAL NATIVE SULFUR DEPOSITS IN ZONE 9KM LONG; ONE FLOURITE OCCURENCE; NO H.S. REPORTED; EMANATION OF GAS
ES (NO TEMP. DATA) INCLUDING H2S IS REPORTED IN SULFUR DEPOSITS; WATERS IN MINES REPORTEDLY ACIDIC. NO RELIABL
E GEOTHERMOMETRY HOWEVER OCCURANCE OF SULFUR DEPOSITS, ALTERATION, AND, REPORTEDLY, SILICEOUS SINTER COUPLED W
ITH HIGH INDUSTRY INTEREST INDICATES GEOTHERMAL POTENTIAL POSSIBLY IN PART A VAPOR-DOMINATED SYSTEM.
PREPARED BY: J. RENNER

NAME: COVE FORT - SULPHURDALE , UT

326

INPUT RECORD # 270 MIRRORED ON 3/76
NAME: THERMO HOT SPRINGS, UT RESOURCE CATEGORY: HOT WATER > 150 C
WARING FIG: 7 NUMBER: 52 DATE: 04/75
LOCATION:

STATE: UT COUNTY: BEAVER
LATITUDE: 38 11.00 TOWNSHIP: 30S
LONGITUDE: 113 12.20 RANGE: 12W
ELEV: 5037 SECTION: 28 SW1/4 NE1/4 B&M: SALT LAKE
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: VALLEY FILL. SAND DUNES APPARENTLY CEMENTED BY HOT SPRINGS

SURFACE DISCHARGE TOTAL: 760.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 1.8 KM**2

APPROX. # OF HOT SPRINGS: 16 SPRINGS

TEMPERATURE: RANGE OF SPRING TEMP. 32 C TO 90 C OR

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 12/74 SOURCE: MARINER (UNPUBLISHED)

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
90	0.0	0.00	113.00	400.00	52.00	71.00	0.0	0.0	0

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
138.5	144.5	117.0	199.7	152.8

RESERVOIR PROPERTIES

RANGE IN RES TEMP 140 C TO 225 C ASSUMED

BEST EST. AVER. TEMP 200.0

AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.20 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO DARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MUNDORFF, 1970; WARING, 1965; PETERSEN, 1973, MARINER, 1975, UNPUBLISHED DATA

TOPO MAPS: THERMO 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

2 GROUPS OF SPRINGS IN 1.8 KM TREND

PREPARED BY: J. RENNER

NAME: THERMO HOT SPRINGS, UT

827

INPUT RECORD # 271 MIRRORED ON 3/76
NAME: HOOPER, UT RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 05/75

LOCATION:

STATE: UT COUNTY: DAVIS
LATITUDE: 41 8.00 TOWNSHIP: 05N
LONGITUDE: 112 11.30 RANGE: 03W
ELEV: 4200 SECTION: 28, SE1/4 1/4 B&M: SALT LAKE
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: QUATERNARY VALLEY FILL, MUD FLATS OF GREAT SALT LAKE

SURFACE DISCHARGE TOTAL: L/MIN

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: -0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 4 HOT SPRINGS IN 2 GROUPS, .6 KM APART

TEMPERATURE: RANGE OF SPRING TEMP. 30 C TO 60 C OR

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 09/53 SOURCE: MUNDORFF, 1970

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HCO3
32	0.0	7.60	48.00	8290.00	803.00	536.00	219.0	14400.0	304

OTHER CHEMICAL DATA MAY BE INFLUENCED BY SALINE WATER IN AREA, SAMPLE FROM SW HOOPER H.S.

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY		
100.9	100.4	68.2	1/3 223.1	4/3 309.8

RESERVOIR PROPERTIES

RANGE IN RES TEMP 0 C TO 0

BEST EST. AVER. TEMP 105.0

AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.12 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MUNDORFF, 1970

TOPO MAPS: OGDEN BAY 1:24,000

SPRING IDENTIFIED: NO

COMMENTS:

ASSOCIATED WITH FAULTING (POST PLEISTOCENE) HOOPER AND SW HOOPER SPRINGS .6 KM APART

PREPARED BY: J. RENNER

NAME: HOOPER, UT

328

INP: RECORD # 272 MIRRORED ON 3/76
NAME: CRYSTAL HOT SPRINGS, UT RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 7 NUMBER: 13 DATE: 05/75
LOCATION:

STATE: UT COUNTY: SALT LAKE
LATITUDE: 40 29.00 TOWNSHIP: 04S
LONGITUDE: 110 54.00 RANGE: 01W
ELEV: 4450 SECTION: 12 SW1/4 NW1/4 B&M: SALT LAKE
SURFACE MANIFESTATIONS: OTHER SPRING DEPOSITS, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: VALLEY FILL, TERTIARY VOLCANICS
SURFACE DISCHARGE TOTAL: 227.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 4

TEMPERATURE: RANGE OF SPRING TEMP. 50 C TO 53 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 05/58 SOURCE: MUNDORFF, 1970

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
58	0.0	7.30	50.00	405.00	55.00	141.00	378.0	337.0	216

OTHER CHEMICAL DATA NA, K & CA ANALYSED IN 1882

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	
102.5	102.3	70.2	195.6	4/3 134.6

RESERVOIR PROPERTIES

RANGE IN RES TEMP 0 C TO 0

BEST EST. AVER. TEMP 135.0

AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.16 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MUNDORFF, 1970, WARING, 1965

TOPO MAPS: JORDAN NARROWS 1:24,000

SPRING IDENTIFIED: NO

COMMENTS:

PREPARED BY: RENNER

NAME: CRYSTAL HOT SPRINGS . UT

329

IN: RECORD # 273 MIRRORED ON 3/76
NAME: BAKER HOT SPRING (ABRAHAM OR CRATER) UT RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 1 NUMBER: 24 DATE: 04/75
LOCATION:

STATE: UT COUNTY: JUAB
LATITUDE: 39 38:30 TOWNSHIP: 14S
LONGITUDE: 112 43:90 RANGE: 08W
ELEV: 4620 SECTION: 10 SW1/4 SE1/4 86M: SALT LAKE
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S)

ROCK AND STRUCTURE TYPE: QUATERNARY BASALT
SURFACE DISCHARGE TOTAL: 950.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX # OF HOT SPRINGS: 4

TEMPERATURE: RANGE OF SPRING TEMP: 64 C TO 87 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 12/74 SOURCE: MARINER, UNPUBLISHED USGS DATA
SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
84	0.0	0.00	69.00	850.00	57.00	345.00	0.0	0.0	0

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
116.0	117.9	87.3	163.0	121.3

RESERVOIR PROPERTIES

RANGE IN RES TEMP 0 C TO 0
BEST EST. AVER. TEMP 125.0
AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.15 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO DARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MUNDORF 1970, WARING, 1965

TOPO MAPS: BAKER HOT SPRINGS 1:24,000

SPRING IDENTIFIED: YES

COMMENTS:

SPRINGS ISSUE FROM TUFFA MOUND AT EAST EDGE OF QUATERNARY BASALT FLOW; DEPOSIT MN OXIDES.

PREPARED BY: J. RENNER

NAME: BAKER HOT SPRING (ABRAHAM OR CRATER) , UT

330

IN RECORD # 274 MIRRORED ON 3/76
NAME: MEADOW HOT SPRINGS .UT RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 7 NUMBER: 28 DATE: 04/75

LOCATION:

STATE: UT COUNTY: MILLARD
LATITUDE: 38 51.80 TOWNSHIP: 22S
LONGITUDE: 112 30.00 RANGE: 06W
ELEV: 4760 SECTION: 27 ,SE1/4 SE1/4 B&M: SALT LAKE
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: VALLEY FILL, (QUATERNARY BASALT 4.8 KM NW)

SURFACE DISCHARGE TOTAL: L/MIN

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 3 IN 1.6KM TREND

TEMPERATURE: RANGE OF SPRING TEMP. 29 C TO 41 C OR

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 05/67 SOURCE: MUNDORFF, (1970)

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
41	226.0	7.50	47.00	1020.00	13.80	433.00	1130.0	1800.0	408

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY		
100.1	99.5	67.1	1/3 96.1	4/3 67.8

RESERVOIR PROPERTIES

RANGE IN RES TEMP 0 C TO 0 C ASSUMED

BEST EST. AVER. TEMP 105.0

AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.12 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO DARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: MUNDORF 1970, WARING, 1965

TOPO MAPS: TABERNACLE HILL 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

INCLUDES HATTON (BLACK ROCK OR WIWIPA) H.S.

PREPARED BY: J. RENNER

NAME: MEADOW HOT SPRINGS . UT

INFO RECORD # 275 MIRRORED ON 3/76
NAME: MONROE HOT SPRINGS (COOPER) .UT RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 7 NUMBER: 48 DATE: 04/75

LOCATION:

STATE: UT COUNTY: SEVIER
LATITUDE: 38 39.20 TOWNSHIP: 25S
LONGITUDE: 112 6.40 RANGE: 03W
ELEV: 5500 SECTION: 11 SW1/4 SW1/4 8&M: SALT LAKE
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: UPPER TERTIARY VOLCANICS ALONG SEVIER FAULT

SURFACE DISCHARGE TOTAL: 2000.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 9 IN 3 GROUPS 4.8 KM TREND.

TEMPERATURE: RANGE OF SPRING TEMP. 25 C TO 76 C OR

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 12/74 SOURCE: MARINER, UNPUBLISHED USGS DATA

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
61	0.0	0.00	59.00	600.00	52.00	295.00	0.0	0.0	0

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY		
109.3	110.2	78.8	171.5	117.1

RESERVOIR PROPERTIES

RANGE IN RES TEMP 0 C TO 0

BEST EST. AVER. TEMP 120.0

AREA 1.0 TO 8.0 KM**2; BEST ESTIMATE 5.0 KM**2

BASED ON SPRING ALONG FAULT

DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 7.50 KM**3

HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.47 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: CALLAGHAN AND PARKER, 1961; MUNDORFF 1970; WARING, 1965

TOPO MAPS: MONROE, 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

MAY EXTEND ALONG FAULT TO TRAVERTINE DEPOSITS IN SEC. 9 T. 26S R 3W; INCLUDES RED HILL AND JOHNSON HOT SPRINGS

PREPARED BY: J. RENNER

NAME: MONROE HOT SPRINGS (COOPER) . UT

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INQ RECORD # 276 MIRRORED ON 3/76
NAME. JOSEPH HOT SPRINGS .UT RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARING FIG: 7 NUMBER: 49 DATE: 04/75

LOCATION:

STATE: UT COUNTY: SEVIER
LATITUDE: 38 36.70 TOWNSHIP: 25S
LONGITUDE: 112 11.20 RANGE: 04W
ELEV: 5500 SECTION: 23 ,SE1/4 NE1/4 B&M: SALT LAKE
SURFACE MANIFESTATIONS: TRAVERTINE.HOT SPRING(S).

ROCK AND STRUCTURE TYPE: TERTIARY VOLCANICS.
SURFACE DISCHARGE TOTAL: 113.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: SEVERAL
TEMPERATURE: RANGE OF SPRING TEMP. 60 C TO 64 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 12/74 SOURCE: MARINER, UNPUBLISHED USGS DATA

SPRING FLOW
TEMP L/MIN PH SIO2 NA K CA SO4 CL HCO3
63 0.0 0.00 92.00 1500.00 50.00 260.00 0.0 0.0 0

OTHER CHEMICAL DATA

SIO2	SIO2	SIO2	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
128.8	133.0	104.0	141.0	131.7

RESERVOIR PROPERTIES

RANGE IN RES TEMP 0 C TO 0
BEST EST. AVER. TEMP 140.0
AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.17 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

W
W
W

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: CALLAGHAN AND PARKER, 1961; MUNDORFF 1970; WARING, 1965

TOPO MAPS: MONROE 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

PREPARED BY: J. RENNER

NAME: JOSEPH HOT SPRINGS • UT

References cited - Utah

- Callaghan, Eugene, and Parker, R. L., 1961, Geology of the Monroe quadrangle, Utah: U.S. Geol. Survey Geol. Quad. Map GQ-155.
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Selected Geothermal Resources Assessment Data

Hydrothermal Convection Systems in Washington

By: J. L. Renner, Denver, Colorado

and

F. W. Smith, Menlo Park, California

Contents

Hot-Spring Data Sheets

Hot water greater than 150°C

Hot water from 90° to 150°C

References

IN RECORD # 277 MIRRORED ON 3/76
NAME: BAKER HOT SPRING, WASH. RESOURCE CATEGORY: HOT WATER > 150 C
WARING FIG: 2 NUMBER: 1 DATE: 04/75
LOCATION:

STATE: WASH. COUNTY: WHATCOM
LATITUDE: 48 45.90 TOWNSHIP: 38N
LONGITUDE: 121 40.20 RANGE: 09E
ELEV: 1440 SECTION: 20 NW1/4 SW1/4 B&M: WILLAMETTE
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: GRANITE overlain by tertiary basalt

SURFACE DISCHARGE TOTAL: 26.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 1?

TEMPERATURE: RANGE OF SPRING TEMP. 42 C TO

MAX. WELL TEMP. C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: CAMPBELL, ET AL 1970

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HCO3
42	0.0	8.00	140.00	165.00	10.00	7.90	0.0	108.0	0

OTHER CHEMICAL DATA LI - 0.4

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
149.2	157.2	131.4	162.1	131.0

RESERVOIR PROPERTIES

RANGE IN RES. TEMP 145 C TO 165 C ASSUMED

BEST EST. AVER. TEMP 165.0

AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM

DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM

THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM

VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.20 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: LIVINGSTON, 1972; WARING, 1965; CAMPBELL, ET AL 1970; VALENTINE, 1960

TOPO. MAPS: MT. SHUKSAN 1:24,000

SPRING IDENTIFIED: YES

COMMENTS:

SOME PPT - CAMPBELL, 1970, MAY BE TRAVERTINE

PREPARED BY: J. RENNER

NAME: BAKER HOT SPRING, WASH

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INPC RECORD # 278 MIRRORED ON 3/76
NAME: GAMMA HOT SPRING WASH RESOURCE CATEGORY: HOT WATER > 150 C
WAKING FIG: NUMBER: DATE: 05/75

LOCATION:

STATE: WASH COUNTY: SNOHOMISH
LATITUDE: 48 10.00 TOWNSHIP:
LONGITUDE: 121 2.00 RANGE:
ELEV: 4000 SECTION: , 1/4 1/4 B&M: WILLAMETTE
SURFACE MANIFESTATIONS: HOT SPRING(S),

ROCK AND STRUCTURE TYPE: VOLCANICS RELATED TO GLACIER PEAK
SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP. 60 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: TABOR & CROWDER, 1969

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HCO3
60	0.0	7.90	150.00	491.00	77.00	47.00	0.0	0.0	0

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
152.7	161.4	136.3	219.6	191.1

RESERVOIR PROPERTIES

RANGE IN RES TEMP 153 C TO 220 C ASSUMED
BEST EST. AVER. TEMP 165.0
AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.20 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: TABOR & CROWDER, 1969

TOPO MAPS: GLACIER PEAK 1:62,500

SPRING IDENTIFIED:NO

COMMENTS:

RELATIVELY YOUNG VOLCANIC TERRAIN

PREPARED BY: J. RENNER

NAME: GAMMA HOT SPRING WASH

337

IN RECORD # 279 MIRRORED ON 3/76
NAME: KENNEDY, WASH RESOURCE CATEGORY: HOT WATER > 150 C
WARING FIG: 2 NUMBER: 5 DATE: 04/75
LOCATION:

STATE: WASH COUNTY: SNOHOMISH
LATITUDE: 48 7.10 TOWNSHIP: 30N
LONGITUDE: 121 11.70 RANGE: 12E
ELEV: 3300 SECTION: 1, SE1/4 NE1/4 B&M: WILLAMETTE
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: GRANITE OVERLAIN BY VOLCANICS OF GLACIER PEAK

SURFACE DISCHARGE TOTAL: 114.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 4

TEMPERATURE: RANGE OF SPRING TEMP. 38 C TO 43 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: TABOR & CROWDER, 1969

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
30	0.0	7.70	136.00	655.00	64.00	37.00	0.0	0.0	0

OTHER CHEMICAL DATA LI - 3.7, MG - 60.4

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
147.7	155.4	129.4	198.9	195.2

RESERVOIR PROPERTIES

RANGE IN RES TEMP 145 C TO 200 C ASSUMED

BEST EST. AVER. TEMP 160.0

AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.20 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MOARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: LIVINGSTON, 1972; WARING, 1965; CAMPBELL ET AL 1970; VALENTINE, 1960; TABOR & CROWDER, 1969

TOPO MAPS: GLACIER PEAK 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

MAY BE AS HOT AS 200C. EXTENSIVE TRAVERTINE DEPOSITS

PREPARED BY: J. RENNER

NAME: KENNEDY, WASH

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INA RECORD # 280 MIRRORED ON 3/76
NAME: LONGMIRE, WASH RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: NUMBER: DATE: 04/75

LOCATION:
STATE: WASH COUNTY: PIERCE
LATITUDE: 46 45.10 TOWNSHIP: 15N
LONGITUDE: 121 48.70 RANGE: 08E
ELEV: 2760 SECTION: 29 SE1/4 SE1/4 B&M: WILLAMETTE
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: TERTIARY VOLCANICS, ASSOC. WITH MT. RAINIER
SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP. 21 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH
CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: CAMPBELL, ETAL, 1970

SPRING FLOW
TEMP L/MIN PH SIO2 NA K CA SO4 CL HC03
21 0.0 6.00 170.00 402.00 37.20 298.00 0.0 615.0 0

OTHER CHEMICAL DATA LI - 1.8, MG - 151.2
SIO2 NA_K_CA OTHER
ADIABATIC CONDUCTIVE CHALCEDONY 1/3 4/3
159.3 169.3 145.5 167.9 98.9

RESERVOIR PROPERTIES

RANGE IN RES TEMP 140 C TO 175 C ASSUMED
BEST EST. AVER. TEMP 170.0
AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.20 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: LIVINGSTON, 1972; CAMPBELL ET AL, 1970; FISKE ET AL, 1963; VALENTINE, 1960

TOPO MAPS: MT. RAINIER WEST 1:24,000

SPRING IDENTIFIED: YES

COMMENTS:

SOME PPT - CAMPBELL, 1970: IN MT. RAINIER NATIONAL PARK, CHEMICAL TEMPERATURES NOT RELIABLE

PREPARED BY: J. RENNER

NAME: LONGMIRE, WASH

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INPUT RECORD # 281 MIRRORED ON 3/76
NAME: SUMMIT CREEK MINERAL SPRINGS (SODA) WASH RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WAKING FIG: NUMBER: DATE: 04/75

LOCATION:
STATE: WASH COUNTY: LEWIS
LATITUDE: 46 42.20 TOWNSHIP: 14N
LONGITUDE: 121 29.00 RANGE: 11E
ELEV: 3200 SECTION: 18 SW1/4 NW1/4 B&M: WILLAMETTE
SURFACE MANIFESTATIONS: OTHER SPRING DEPOSITS, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: TERTIARY VOLCANIC BRECCIA
SURFACE DISCHARGE TOTAL: L/MIN
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP. 13 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: CAMPBELL, ET AL, 1970

SPRING FLOW TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
13	0.0	6.00	170.00	1790.00	86.70	278.00	0.0	1552.0	0

OTHER CHEMICAL DATA LI - 5.9, MG 87.5

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
159.3	169.3	145.5	161.0	157.6

RESERVOIR PROPERTIES

RANGE IN RES TEMP 145 C TO 170 C ASSUMED
BEST EST. AVER. TEMP 170.0
AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON:
DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.20 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY:
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: LIVINGSTON, 1972; CAMPBELL, ET AL, 1970, VALENTINE, 1960

TOPO MAPS: WHITE PASS 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

TOPO SHOWS AS SODA SPRINGS, CHEMICAL TEMPERATURES NOT RELIABLE

PREPARED BY: J. RENNERT

NAME: SUMMIT CREEK MINERAL SPRINGS (SODA) WASH

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IN RECORD # 282 MIRRORED ON 3/76
NAME: SOL DUC HOT SPRING WASH RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 2 NUMBER: 2 DATE: 04/75
LOCATION:

STATE: WASH COUNTY: CLALLAM
LATITUDE: 47 58.10 TOWNSHIP: 29N
LONGITUDE: 123 52.10 RANGE: 09W
ELEV: 1700 SECTION: 32 1/4 1/4 8&M: WILLAMETTE
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: MESOZOIC & TERTIARY VOLCANICS

SURFACE DISCHARGE TOTAL: 510.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 3 MAIN, 8 SMALLER

TEMPERATURE: RANGE OF SPRING TEMP. 37 C TO 56 C OR

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: CAMPBELL AND OTHERS, 1970

SPRING FLOW

TEMP L/MIN

50 0.0

PH 7.50

SI02 120.00

NA 84.00

K 1.60

CA 1.60

SO4 0.0

CL 1.7

HCO3 0

OTHER CHEMICAL DATA

SI02

SI02

SI02
CHALCEDONY

NA_K_CA

OTHER

ADIABATIC

CONDUCTIVE

1/3

4/3

141.5

147.9

120.9

112.7

92.4

RESERVOIR PROPERTIES

RANGE IN RES TEMP 90 C TO 150

BEST EST. AVER. TEMP 150.0

AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2

DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.18 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: LIVINGSTON, 1972; WARING, 1965; CAMPBELL AND OTHERS, 1970; VALENTINE, 1960

TOPO MAPS: BOGACHEL PEAK 1:24,000

SPRING IDENTIFIED: YES

COMMENTS:

QTZ THERMOMETRY MAY BE HIGH; BETTER AGREEMENT BETWEEN NA-K-CA AND CHALCEDONY T.

PREPARED BY: J. RENNER

NAME: SOL DUC HOT SPRING WASH

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INA RECORD # 283 MIRRORED ON 3/76
NAME: OLYMPIC HOT SPRINGS, WASH RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARING FIG: 2 NUMBER: 3 DATE: 04/75
LOCATION:

STATE: WASH COUNTY: CLALLAM
LATITUDE: 47 58.90 TOWNSHIP: 29N
LONGITUDE: 123 41.20 RANGE: 7W
ELEV: 2061 SECTION: 29, 1/4, 1/4 M&M: WILLAMETTE
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: MESOZOIC & TERTIARY VOLCANICS

SURFACE DISCHARGE TOTAL: 510.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 17 SPRINGS

TEMPERATURE: RANGE OF SPRING TEMP. 49 C TO 52 C OR

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: CAMPBELL AND OTHERS, 1970

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	NA_K	CA	SO4	CL	HC03
47	0.0	7.50	80.00	78.00	1.30	1.40	0.0	0.7	0

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY		
122.5	125.5	95.7	1/3 4/3	107.5 87.4

RESERVOIR PROPERTIES

RANGE IN RES TEMP 85 C TO 130

BEST EST. AVER. TEMP 130.0

AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.15 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: LIVINGSTON, 1972; WARING, 1965; CAMPBELL AND OTHERS, 1970; VALENTINE 1960

TOPO MAPS: MT. CARRIE 1:24,000

SPRING IDENTIFIED: YES

COMMENTS:

SPRINGS ALONG FAULT ZONE

PREPARED BY: J. RENNERT

NAME: OLYMPIC HOT SPRINGS, WASH

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IN RECORD # 284 MIRRORED ON 3/76
NAME: SULPHUR CREEK HOT SPRINGS, WASH RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARNING FIG: 2 NUMBER: 4 DATE: 04/75

LOCATION:

STATE: WASH COUNTY: SNOHOMISH
LATITUDE: 48 15.30 TOWNSHIP: 32N
LONGITUDE: 121 10.80 RANGE: 13E
ELEV: 3000 SECTION: 18, NW1/4 NW1/4 B&M: WILLAMETTE
SURFACE MANIFESTATIONS: HOT SPRING(S),

ROCK AND STRUCTURE TYPE: TERTIARY GRANITE
SURFACE DISCHARGE TOTAL: 15.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS:

TEMPERATURE: RANGE OF SPRING TEMP. 37 C TO
MAX. WELL TEMP C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: TABOR & CROWDER, 1969

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
30	0.0	7.80	75.00	103.00	1.70	1.00	0.0	0.0	0

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	
119.6	122.2	92.0	112.8	4/3 108.6

RESERVOIR PROPERTIES

RANGE IN RES TEMP 110 C TO 130 C ASSUMED
BEST EST. AVER. TEMP 125.0
AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.15 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1965; LIVINGSTON 1972; CAMPBELL AND OTHERS 1970; VALENTINE 1960; TABOR & CROWDER, 1969

TOPO MAPS: PUGH MTN. 1:24,000

SPRING IDENTIFIED: YES

COMMENTS:

MINOR PPT - CAMPBELL, 1970

PREPARED BY: J. RENNER

NAME: SULPHUR CREEK HOT SPRINGS, WASH

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INA RECORD # 285 MIRRORED ON 3/76
NAME: GARLAND (SAN JUAN) .WASH RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 2 NUMBER: 6 DATE: 04/75

LOCATION:

STATE: WASH COUNTY: SNOHOMISH
LATITUDE: 47 20.50 TOWNSHIP: 28N
LONGITUDE: 121 53.40 RANGE: 11E
ELEV: 1560 SECTION: 25 ,NE1/4 NW1/4 B&M: WILLAMETTE
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: TERTIARY GRANITE
SURFACE DISCHARGE TOTAL: 95.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 3

TEMPERATURE: RANGE OF SPRING TEMP. 21 C TO 38 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: CAMPBELL AND OTHERS, 1970

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HCO3
21	0.0	6.00	120.00	1592.00	130.00	336.00	0.0	2671.0	0

OTHER CHEMICAL DATA LI - 7.5, MG - 74.8

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
141.5	147.9	120.9	184.6	169.7

RESERVOIR PROPERTIES

RANGE IN RES TEMP 140 C TO 190
BEST EST. AVER. TEMP 150.0
AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2
BASED ON
DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.
DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.
THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.
VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3
HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.18 E18 CAL
POROSITY TO BEST ESTIMATE
PERMEABILITY TO MDARCY;
AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1965; LIVINGSTON, 1972; CAMPBELL AND OTHERS, 1970; VALENTINE, 1960

TOPO MAPS: BLANCA LAKE 1:24,000

SPRING IDENTIFIED: YES

COMMENTS:

EXTENSIVE PPT. - CAMPBELL, 1970; CALCITE PPT. ?

PREPARED BY: J. RENNÉ

NAME: GARLAND (SAN JUAN) . WASH

IN RECORD # 286 MIRRORED ON 3/76
NAME: OHANAPECOSH HOT SPRINGS WASH RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARING FIG: 2 NUMBER: 11 DATE: 04/75

LOCATION:

STATE: WASH COUNTY: LEWIS
LATITUDE: 46 44.20 TOWNSHIP: 14N
LONGITUDE: 121 33.60 RANGE: 10E
ELEV: 1920 SECTION: 4 .NE1/4 NW1/4 B&M: WILLAMETTE
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: TERTIARY VOLCANICS (BASALT)
SURFACE DISCHARGE TOTAL: 225.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 0.0 KM**2
APPROX. # OF HOT SPRINGS: 5

TEMPERATURE: RANGE OF SPRING TEMP. 43 C TO 49 C OR
MAX. WELL TEMP C AT M DEPTH BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: CAMPBELL AND OTHERS, 1970

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
40	0.0	7.00	80.00	981.00	50.90	85.00	0.0	869.0	0

OTHER CHEMICAL DATA LI - 3.3 , MG - 7.5

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
122.5	125.5	95.7	164.3	160.4

RESERVOIR PROPERTIES

RANGE IN RES TEMP 120 C TO 165 C ASSUMED

BEST EST. AVEN. TEMP 130.0

AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.15 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: LIVINGSTON, 1972; WARING, 1965; CAMPBELL AND OTHERS, 1970; VALENTINE, 1960

TOPO MAPS: PACKWOOD 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

EXTENSIVE PPT. - CAMPBELL, 1970

PREPARED BY: J. PENNER

NAME: OHANAPECOSH HOT SPRINGS WASH

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Selected Geothermal Resources Assessment Data

Hydrothermal Convection Systems in Wyoming

By: J. L. Renner, Denver, Colorado

and

D. E. White, Menlo Park, California

Contents

Hot-Spring Data Sheets

Vapor-dominated systems

Hot water greater than 150°C

Hot water from 90° to 150°C

References

INH RECORD # 287 MIRRORED ON 3/76
NAME: MUD VOLCANO (YELLOWSTONE) WY RESOURCE CATEGORY: VAPOR-DOMINATED
WARNING FIG: 5 NUMBER: 618 TO 0 DATE: 03/75

LOCATION:

STATE: WY COUNTY: YELLOWSTONE
LATITUDE: 44 37.50 TOWNSHIP:
LONGITUDE: 110 26.00 RANGE:
ELEV: 7600 SECTION: , 1/4 1/4 BEM:
SURFACE MANIFESTATIONS: SINTER; HOT SPRING(S); FUMAROLE OR WARM VAPOR;

ROCK AND STRUCTURE TYPE: YELLOWSTONE GROUP AND GLACIAL DEPOSITS

SURFACE DISCHARGE TOTAL: 100.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 5.0 KM**2

APPROX: # OF HOT SPRINGS: 50

TEMPERATURE: RANGE OF SPRING TEMP: 22 C TO 90 C OR

MAX. WELL TEMP 191 C AT 105 M DEPTH

BOTTOM HOLE TEMP: 191 C AT 106 M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE:

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HCO3
0	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0

OTHER CHEMICAL DATA

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY		
0.0	0.0	0.0	1/3 0.0	4/3 0.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 200 C TO 240 C ASSUMED

BEST EST: AVER: TEMP 230.0

AREA 4.0 TO 10.0 KM**2; BEST ESTIMATE 5.0 KM**2

BASED ON SURFACE ACTIVITY

DEPTH TO TOP OF RES: 0.10 KM TO 0.30 KM; BEST ESTIMATE 0.20 KM

DEPTH TO BOTTOM OF RES: 1.50 KM TO 3.00 KM; BEST ESTIMATE 1.50 KM

THICKNESS 1.40 TO 1.20 KM; BEST ESTIMATE 1.30 KM

VOLUME 6.00 TO 15.00 KM**3; BEST ESTIMATE 6.50 KM**3

HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.84 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS: GRAVITY, MAG, DC RESISTIVITY, SEISMIC NOISE, AND MICROEARTHQUAKES

DEVELOPMENTS: ONE RESEARCH HOLE, Y-11, USGS

REFERENCES: ZOHDY, ANDERSON, AND MUFFLER, 1973; WHITE, MUFFLER, AND TRUESDELL, 1971; ALLEN AND DAY, 1935

TOPO MAPS: CANYON VILLAGE 1/62, 500; 1/2, 400 SPECIAL

SPRING IDENTIFIED: YES

COMMENTS:

DISCOVERY & CHARACTERISTICS DESCRIBED BY WHITE, MUFFLER, & TRUESDELL, 1971; ZOHDY & OTHERS, 1973. FOUND RESISTIVITIES TO 1.5 KM DEPTH TO HAVE HIGHER THAN EXPECTED OF A HOT WATER RESERVOIR, BUT LOWER RESISTIVITIES > 1.5 KM DEPTH, PROBABLY FROM HOT SALINE WATER.

PREPARED BY: D.E. WHITE

NAME: MUD VOLCANO (YELLOWSTONE) WY

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IN RECORD # 288 MIRRORED ON 3/76
NAME: YELLOWSTONE PARK, WYOMING RESOURCE CATEGORY: HOT WATER > 150 C
WARNING FIG: 5 NUMBER: 1-96 DATE: 01/75

LOCATION:

STATE: WYOMING COUNTY: YELLOWSTONE
LATITUDE: 44 36.00 TOWNSHIP:
LONGITUDE: 110 30.00 RANGE:
ELEV: 7500 SECTION: 1/4 1/4 H&M:

SURFACE MANIFESTATIONS: SINTER, TRAVERTINE, OTHER-SPRING DEPOSITS, GEYSER(S), FUMAROLE OR WARM VAPOR.

ROCK AND STRUCTURE TYPE: GLACIAL DEPOSITS, ASH-FLOW TUFFS AND RHYOLITE LAVA FLOWS (PLEISTOCENE) ON TERTIARY VOLCANIC ROCKS AND PRE-TERTIARY SEDIMENT

SURFACE DISCHARGE TOTAL: 185000.0 L/MIN MEASURED X ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 1.04E+08 CAL/SEC
AREA OF SURFACE EX: 355.0 KM**2

APPROX. # OF HOT SPRINGS: SEVERAL THOUSAND

TEMPERATURE: RANGE OF SPRING TEMP. 50 C TO 96 C OR
MAX. WELL TEMP 237 C AT 332 M DEPTH

BOTTOM HOLE TEMP. 238 C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: SYSTEMS

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HCO3
0	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0

OTHER CHEMICAL DATA QTZ TEMP 250C; NA-K-CA 270C. MIXING MODELS INDICATE POSSIBLY 330C

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
0.0	0.0	0.0	0.0	0.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 150 C TO 300 C ASSUMED MEASURED

BEST EST. AVER. TEMP 250.0

AREA 300.0 TO 500.0 KM**2; BEST ESTIMATE 375.0 KM**2

BASED ON SURFACE AREA OF CLUSTERED ACTIVITY

DEPTH TO TOP OF RES. 0.10 KM TO 1.00 KM; BEST ESTIMATE 0.50 KM.

DEPTH TO BOTTOM OF RES. 3.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 2.50 KM.

VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 940.00 KM**3

HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 133.00 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

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GEOPHYSICAL SURVEYS: GRAVITY, MAG, DC RESISTIVITY, SEISMIC NOISE, P DELAY, MICROEARTHQUAKES, HEAT FLOW DEVELOPMENTS: 13 RESEARCH DRILL HOLES, MAX. DEPTH 332 M; NO COMMERCIAL DEVELOPMENT AND NONE PROPOSED REFERENCES: ALLEN AND DAY, 1935; MUCH PUBLISHED AND UNPUBLISHED DATA, U.S.G.S.

TOPO MAPS: ALL PARK 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

STORED HEAT CONTENT OF 130E+18 CAL TO 3KM DEPTH IS EQUIVALENT TO 4,000 YRS OF HEAT FLOW (PRESENT RATE). THE 37 5 KM2 OF AREA ASSUMED TO BE UNDERLAIN BY HIGH-TEMP. CONVECTION SYSTEMS IS PROBABLY A MINIMUM OF THE ACTIVE ARE AS. ABOUT 280 KM2 IS IN YELLOWSTONE CALDERA

PREPARED BY: D. E. WHITE

NAME: YELLOWSTONE PARK, WYOMING

INFO RECORD # 289 MIRRORED ON 3/76
NAME: HUCKLEBERRY, WYO RESOURCE CATEGORY: HOT WATER 90 TO 150 C
WARING FIG: 2 NUMBER: 100 DATE: 04/75
LOCATION:

STATE: WYO COUNTY: TETON
LATITUDE: 44 7:00 TOWNSHIP: 48N
LONGITUDE: 110 41:00 RANGE: 11S
ELEV: 6820 SECTION: 8 NE1/4 NW1/4 B&M: 6TH PRINCIPAL MER
SURFACE MANIFESTATIONS: HOT SPRING(S).

ROCK AND STRUCTURE TYPE: TERTIARY LAVA OVERLYING CRETACEOUS SHALE

SURFACE DISCHARGE TOTAL: 380.0 L/MIN ESTIMATED: X

CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER

TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC

AREA OF SURFACE EX: 0.0 KM**2

APPROX. # OF HOT SPRINGS: 2 SMALL GROUPS

TEMPERATURE: RANGE OF SPRING TEMP: 71 C OR

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 00/00 SOURCE: WHITE UNPUBLISHED ANALYSIS

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HCO3
71	0.0	7.10	124.00	201.00	7.80	12.00	12.0	102.0	372

OTHER CHEMICAL DATA DATA IS SOMEWHAT SUSPECT FOR SI02

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	4/3
143.1	149.9	123.1	140.8	112.1

RESERVOIR PROPERTIES

RANGE IN RES TEMP 0 C TO 0 C ASSUMED

BEST EST. AVER. TEMP 150.0

AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES: 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM;

DEPTH TO BOTTOM OF RES: 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM;

THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM;

VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.18 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY;

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: WARING, 1965; HAGUE A., ETAL, 1898; HAGUE A., ETAL, 1899

TOPO MAPS: HUCKLEBERRY MTN 1:62,500

SPRING IDENTIFIED: YES

COMMENTS:

PREPARED BY: RENNER

NAME: HUCKLEBERRY, WYO

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INPR RECORD # 290 MIRRORED ON 3/76
NAME: AUBURN ,WYO RESOURCE CATAGORY: HOT WATER 90 TO 150 C
WARING FIG: 2 NUMBER: 103 DATE: 04/75

LOCATION:

STATE: WYO COUNTY: LINCOLN
LATITUDE: 42 49.50 TOWNSHIP: 33N
LONGITUDE: 111 0.00 RANGE: 119
ELEV: 6000 SECTION: 23 SW1/4 NW1/4 B&M: 6TH PRINCIPAL MER
SURFACE MANIFESTATIONS: TRAVERTINE, HOT SPRING(S).

ROCK AND STRUCTURE TYPE: TRIASSIC SEDIMENTS
SURFACE DISCHARGE TOTAL: 140.0 L/MIN ESTIMATED: X
CALCULATED TOTAL DISCHARGE: L/MIN OF DEEP WATER
TOTAL SURFACE HEAT FLOW: 0.00E+00 CAL/SEC
AREA OF SURFACE EX: 1.3 KM**2

APPROX. # OF HOT SPRINGS: MORE THAN 100 VENTS

TEMPERATURE: RANGE OF SPRING TEMP. 16 C TO 62 C OR

MAX. WELL TEMP C AT M DEPTH

BOTTOM HOLE TEMP. C AT M DEPTH

CHEMICAL DATA ANALYSIS DATE 04/58 SOURCE: WHITE UNPUBLISHED ANALYSIS

SPRING FLOW

TEMP	L/MIN	PH	SI02	NA	K	CA	SO4	CL	HC03
16	11.0	8.20	110.00	1500.00	180.00	252.00	1430.0	2000.0	70

OTHER CHEMICAL DATA DATA SOMEWHAT SUSPECT FOR SI02

SI02	SI02	SI02	NA_K_CA	OTHER
ADIABATIC	CONDUCTIVE	CHALCEDONY	1/3	
137.2	142.9	115.2	208.6	4/3 197.0

RESERVOIR PROPERTIES

RANGE IN RES TEMP 0 C TO 0 C ASSUMED

BEST EST. AVER. TEMP 150.0

AREA 0.0 TO 0.0 KM**2; BEST ESTIMATE 1.5 KM**2

BASED ON

DEPTH TO TOP OF RES. 0.00 KM TO 0.00 KM; BEST ESTIMATE 1.50 KM.

DEPTH TO BOTTOM OF RES. 0.00 KM TO 3.00 KM; BEST ESTIMATE 3.00 KM.

THICKNESS 0.00 TO 0.00 KM; BEST ESTIMATE 1.50 KM.

VOLUME 0.00 TO 0.00 KM**3; BEST ESTIMATE 2.25 KM**3

HEAT CONTENT > 15 C 0.00 TO 0.00 E18 CAL; BEST ESTIMATE 0.18 E18 CAL

POROSITY TO BEST ESTIMATE

PERMEABILITY TO MDARCY:

AVERAGE WELL FLOW TO KG/HR; WELL DIAMETER CM

GEOPHYSICAL SURVEYS:

DEVELOPMENTS:

REFERENCES: RUBEY & MURATA, 1941; WARING, 1965; RUBEY, 1958 (G0-109)

TOPO MAPS: AUBURN 1:125,000

SPRING IDENTIFIED: NO

COMMENTS:

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