

U.S. Department of the Interior
U.S. Geological Survey

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from Yellowstone National Park, Wyoming,
and Vicinity, 1980-1993

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INTRODUCTION

Waters from hot springs, pools, and geysers have been analyzed by numerous investigators throughout the history of Yellowstone National Park. The chemistry of the more easily accessible major geyser basins and a significant number of Yellowstone thermal waters on the eastern side of the Yellowstone River has been compiled by Gooch and Whitfield (1888), Allen and Day (1935), Rowe and others (1973), Thompson and others (1975), Thompson and Yadav (1979), and Kharaka and others (1992). The first comprehensive study of Shoshone Geyser Basin was made by A.H. Truesdell in 1972-73 (Truesdell and Thompson, 1982). Many of the concepts presented in that report are applicable to other Yellowstone thermal areas. Locations of the major thermal water basins mentioned in this report can be found in Figure 1.

The collection of data on the hot and cold springs of Yellowstone National Park is important in understanding the geothermal chemistry of this system. Geochemical changes that occur over time, the disappearance of existing springs, the appearance of new ones and geochemical changes in spring waters prior to earthquakes, can be monitored. Especially important are those springs for which there is little or no data.

Shortly after the release of Thompson and Yadav (1979), a major effort, in cooperation with the National Park Service, was made to visit many of the back-country thermal areas. This report contains analyses from Hot Spring Basin and nearby Rainbow Hot Springs, Ponuntpa Hot Springs, Fern Lake thermal area and Astringent Creek thermal area in the more remote eastern part of Yellowstone. Extensive collections also were made in the southwestern part of Yellowstone: the Three Rivers Junction area (Ferris Fork, Gregg Fork, and Philips Fork) and the Bechler River and the Boundary Creek thermal areas (Southern, Central, and Northern Boundary Creek and the Silver Scarf thermal area). These hot spring areas, located at the base of the Madison Plateau, as well as the numerous springs along the south and east sides of the Pitchstone Plateau may be related chemically to the Hillside Springs group near Upper Geyser Basin. Also, it is unknown if the Three Forks Hot Springs are related chemically to the Pitchstone Plateau or the Madison Plateau. On the eastern side of Yellowstone, it is uncertain if Joseph Coats Hot Springs, Ponuntpa Hot Springs, and Rainbow Hot Springs are related chemically to Hot Spring Basin. The former hot springs are all at least 65 m lower than Hot Spring Basin and are neutral, chloride-containing waters as opposed to the acidic, low-chloride waters of Hot Spring Basin. The northeast-trending Yellowstone hotspot may be the heat source of the boiling acidic waters of Hot Spring Basin unless it has shifted and is migrating along the Mammoth Corridor. Because most pH-neutral, high-chloride waters lie inside the Yellowstone Caldera, the significance of the pH-neutral, high-chloride waters from Norris Geyser Basin, Geyser Creek Geyser Basin and Heart Lake Geyser Basin, all which lie outside the caldera, is unknown.

FIELD COLLECTION

All water samples were collected using methods similar to those described by Thompson and others (1975) and Thompson and Yadav (1979). All water samples, except those for silica and isotope analysis, were collected using a 1 L plastic bottle attached to a 2 m pole. The bottle was rinsed numerous times before being filled with the sample water. Using a portable hand

pump, the sample water was passed through a 0.45 μm or finer filter. Then the samples for anion determination were put into a pre-cleaned (soaked overnight in 10% nitric acid then rinsed with deionized distilled water) 500 or 250 mL plastic bottle. Samples for major cation and trace metal determinations were put into a pre-cleaned, acid-rinsed 250 or 125 mL plastic bottle and acidified with trace-metal grade hydrochloric acid. For silica analysis, a 10 mL sample was collected directly from the hot spring using a pipette and put into a 60 or 125 mL plastic bottle. Then 10 or 100 mL of deionized-distilled water was added. Samples for deuterium and oxygen-18 determinations were collected in a 60 mL or larger flint glass bottle with a polyseal cap. Samples for carbon-13 determination were collected in a 250 mL glass bottle with a polyseal cap and 10 mL of saturated SrCl_2 in concentrated NH_4OH was added to the sample after filtration (0.45 μm) to remove any atmospherically produced SrCO_3 .

Temperature measurements of hot springs were initially obtained using a maximum-reading, total immersion, mercury-in-glass pocket thermometer ($\pm 0.5^\circ\text{C}$). After 1986, a thermistor probe ($\pm 0.1^\circ\text{C}$), providing automatic temperature compensation for the pH electrode, was used. Temperature measurements of cold springs were initially made with a conventional, mercury-in-glass pocket thermometer. Later the thermistor probe on the pH meter was used also.

In the earlier reports (Thompson and others, 1975; Thompson and Yadav, 1979), latitude and longitude were determined from either 15' quadrangle maps or from 1:2400 geyser basin maps. With the assistance of the Deformation Project at Cascades Volcano Observatory, latitude and longitude of thermal features were determined by Global Positioning Satellite (GPS) using a Sony IPS-360 GPS receiver. The positions are accurate to about 60 m. The position reported is the average of ten or more readings.

FIELD ANALYSIS

Determinations of pH were made using a combination, gel-filled, pH electrode and a portable pH meter (± 0.01) having automatic temperature compensation and a liquid crystal display. Conductivity measurements were made using a small, compact portable conductivity meter. Dissolved ammonia and hydrogen sulfide concentrations were determined on site with a Bausch & Lomb (B & L) minispec 20 spectrophotometer and B & L spectrokits for methods based on American Public Health Association (APHA) (1975) procedures 418B and 428C for ammonia and hydrogen sulfide concentrations, respectively.

LABORATORY ANALYSES

Chemical Analyses

Acidity was determined titrimetrically by automated pH titration using standardized sodium hydroxide, typically about 0.02 N, to an endpoint near pH 7.0 (Fishman and Friedman, 1985). The pH at the start of the titration was reported as the laboratory pH of the sample.

Aluminum was determined by atomic-emission spectroscopy (AES) in a direct-current argon plasma (DCP) at a wavelength of 396.2 nm by scanning over the spectral peak. Aluminum was determined only for samples having no bicarbonate (acidic samples).

Ammonia was determined by spectrophotometry following procedure 428C described by the APHA (1975).

Arsenic was determined by AES in a DCP at a wavelength of 197.2 nm.

Barium was determined by AES in a DCP at a wavelength of 455.4 nm.

Bicarbonate was determined titrimetrically by automated pH titration using standardized sulfuric acid, typically about 0.05 N, to an endpoint near pH 4.2 (Fishman and Friedman, 1985). The pH at the start of the titration was reported as the laboratory pH of the sample. For moderate HCO_3^- containing waters and for high P_{CO_2} water ($\text{P}_{\text{CO}_2} > 1 \text{ atm}$), some bicarbonate will react ($2\text{HCO}_3^- \rightleftharpoons \text{CO}_2 + \text{H}_2\text{O} + \text{CO}_3^{2-}$) to form CO_2 and CO_3^{2-} . This reaction will slowly raise the pH of the water. Thus, the pH of the water in the field and in the laboratory are different. For equilibrium calculations, the field pH is preferred.

Boron was initially determined by spectrophotometry using the carmine procedure described by Brown and others (1970). Because this procedure uses 20 mL of concentrated sulfuric acid per sample or standard, the procedure was changed in 1986 so that boron was determined by AES in a DCP at a wavelength of 249.7 nm.

Bromide was determined by ion chromatography using a conductivity detector. The eluent was 2.2 mM Na_2CO_3 and 0.8 mM NaHCO_3 in a Dionex AS-4 column using a Dionex 2010.

Calcium and **magnesium** were determined simultaneously by atomic absorption spectrometry (AAS) in an air-acetylene flame at a wavelength of 422.7 nm and 285.2 nm, respectively, with added La ion (1% v/v).

Cesium and **rubidium** were determined simultaneously by AES in an air-acetylene flame at a wavelength of 852.1 nm and 780.0 nm, respectively, with added ultra pure K ion (0.1% v/v)

Chloride was determined by automated potentiometric titration to an endpoint near 310 mV with standardized 0.015 N AgNO_3 .

Copper, at concentrations >0.01 , was determined by AAS in an air acetylene flame at a wavelength of 324.7 nm. At concentrations <0.01 , copper was determined by graphite furnace AAS, also at a wavelength of 324.7 nm.

Fluoride was determined by ion specific electrode using a 1:1 mixture of CDTA in an acetate buffer at pH 5.5 with 1 M NaCl (Fishman and Friedman, 1985) to sample or standard.

Iron and **manganese** were determined simultaneously by AAS in an air acetylene flame at a wavelength of 248.3 nm and 275.5 nm, respectively, with added K ion (0.1 % v/v). After 1990, speciated iron concentrations were determined using the ferrozine technique described by Stookey (1970) as modified by D.K. Nordstrom, U.S.G.S. (written communication, 1989). The manganese procedure remained the same.

Lithium was determined by either AES or AAS in an air-acetylene flame at a wavelength of 670.8 nm with added K ion (0.1 % v/v).

Potassium was determined by either AAS or AES in an air-acetylene flame at a wavelength of 766.5 nm with added Na ion (0.1 % v/v).

Silica was determined by spectrophotometry from reduced molybdenum blue at a wavelength of 640 nm using modifications to the Shapiro and Brannock Rapid Rock technique (1956 and 1962).

Sodium was determined by either AAS or AES in an air-acetylene flame at a wavelength of 589.0 nm with added K ion (0.1 % v/v).

Strontium was initially determined by AES in a reducing nitrous oxide-acetylene flame at a wavelength of 460.7 nm. The procedure was changed in 1986 to AES in a DCP at a wavelength of 421.6 nm.

Sulfate was determined by numerous techniques. Initially, the thorin technique described by Brown and others (1970) was used. Later, the turbidimetric procedure described by Fishman and Friedman (1985) in which SO_4 is precipitated by BaCl_2 in acidic NaCl was employed. Finally, an ion chromatograph with a suppressed conductivity detection was used for the 1990 and 1993 samples.

Sulfide was determined by using an iodometric titration for samples collected during and after 1990. A 100 mL sample was precipitated with 2 mL of 20 percent $\text{Zn}(\text{OAc})_2$ to inhibit oxidation. The sample was later acidified with 10 mL of 12N HCl to dissolve the zinc sulfide. A known concentration of I_2 was added to oxidize any sulfide to sulfur. Excess I_2 was titrated with standardized $\text{S}_2\text{O}_3^{2-}$ to the starch endpoint (Fishman and Friedman, 1985). Sulfides collected prior to 1990 were analyzed in the field, using the APHA procedure (1975).

In the process of preparing this report, all samples were checked for cation-anion imbalance. Well over 90% of the samples had errors less than 10%. Some samples from Cistern Spring and Echinus Geyser had error significantly greater than 10%. In addition, some cold waters approach the limit of detection for all major ions. These samples also had high errors.

Isotopic Analyses

Deuterium was determined following the technique of Bigeleisen, Perlman, and Prosser (1952).

Tritium was determined following the technique of Ostlund and Werner (1962).

Oxygen-18 was determined following the technique of Epstein and Mayeda (1953).

Carbon-13 was determined on HCO_3 precipitated as SrCO_3 following the procedure described by Huebner (1981).

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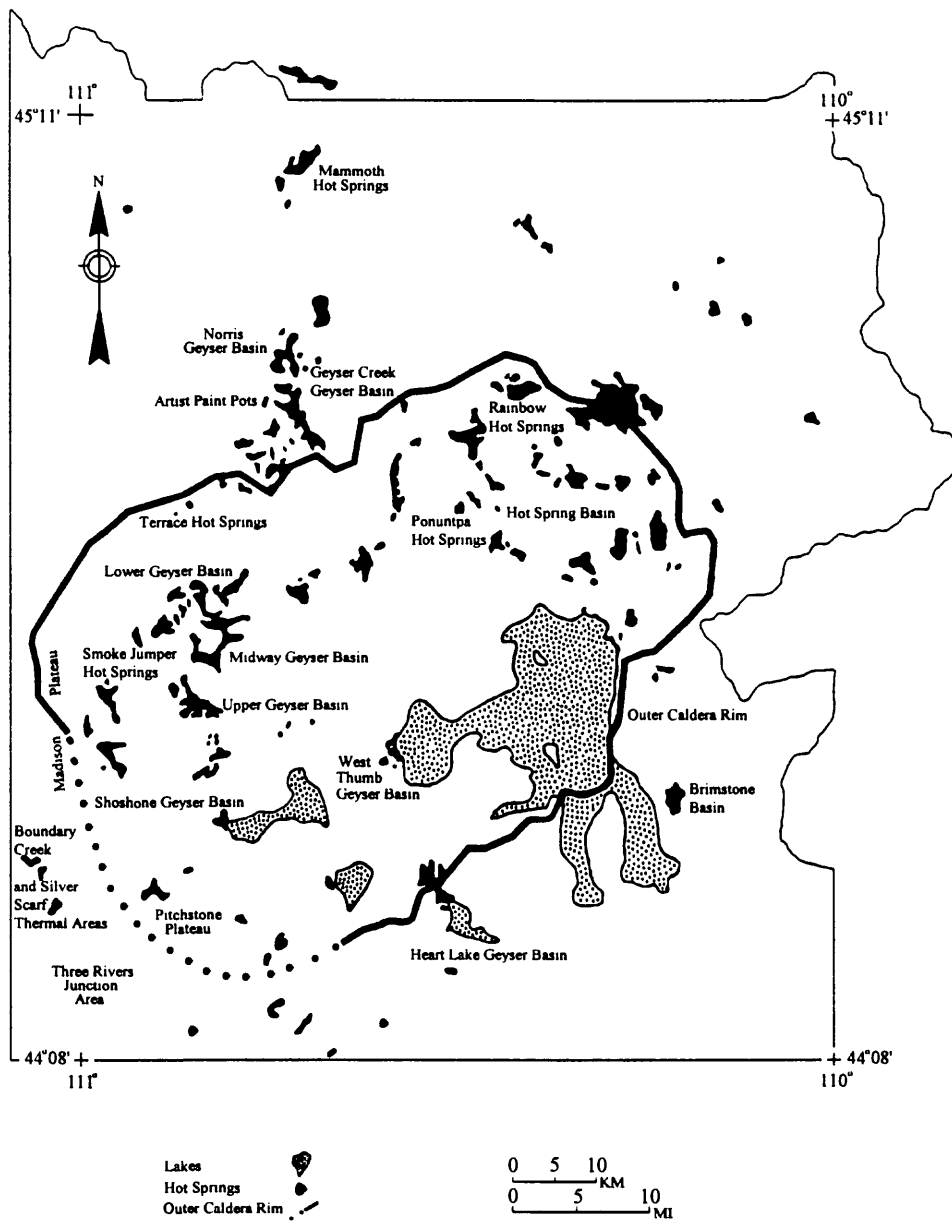


Figure 1: Map of Yellowstone National Park showing locations of major hot springs and geyser basins. (Modified from Mazor and Thompson, 1982.)

Explanation of Abbreviations

n.o.	not observed
n.r.	not recorded
n.e.	not estimated
--	not determined
f pH	field pH
l pH	lab pH
Coll.	Collector
AHT	Truesdell
JC	Chadwick
JMT	Thompson
LJPM	Muffler
MK	Kennedy
RAH	Hutchinson
ROF	Fournier
ROF&	Fournier and Thompson
RS	Shields
WH	Hamilton

*GPS location determined using a Sony IPS-360 Receiver

**Because the field pH is above 8.6, CO₃ is present but is calculated as HCO₃⁻

Table I: Water Analyses

Sample Number	Date Name and/or Description	Latitude	Longitude	Discharge (L/min)	Coll.	Temp. (°C)
HEART LAKE GEYSER BASIN						
Rustic Group						
J7814	3-Oct-78 Prometheus Spring, 20m south of Rustic Geyser	44°16.901'	110°30.335'	10	JMT	89.0
J7811	3-Oct-78 Rustic Geyser, during refill	*44°16.947'	*110°31.403'	0	JMT	84.0
J7812	3-Oct-78 Unnamed subterranean geyser	--	--	n.e.	JMT	93.0
J7813	3-Oct-78 Columbia Spring	*44°16.628'	*110°31.525'	40	JMT	87.5
Lower Group						
J7815	4-Oct-78 Unnamed small geyser, refilling, eastern side	--	--	n.e.	JMT	94.0
J7816	4-Oct-78 Unnamed small spring, eastern side	--	--	1	JMT	92.0
J7817	4-Oct-78 Unnamed small spring, eastern side	--	--	4	JMT	94.0
J7818	4-Oct-78 Unnamed large spring, western side	--	--	22	JMT	88.0
Middle Group						
J7819	4-Oct-78 "Double Spring"	44°17.937'	110°31.135'	12	JMT	n.r.
J7820	4-Oct-78 Unnamed spring	44°17.950'	110°31.076'	2	JMT	61.0
Fissure Group						
J7824	4-Oct-78 "Shelf Spring"	--	--	2	JMT	75.0
J7825	4-Oct-78 Unnamed spring, top of fissure	--	--	20	JMT	93.0
J7826	4-Oct-78 "Triple Bulger" Geyser	--	--	n.e.	JMT	88.0
J7827	4-Oct-78 Unnamed spring	--	--	1	JMT	93.0
J7828	4-Oct-78 Unnamed spring	--	--	10	JMT	90.0
Upper Group						
J7821	4-Oct-78 Base of Spike Geyser	44°19.071'	110°31.623'	8	JMT	93.0
J7822	4-Oct-78 Deluge Geyser	*44°18.371'	*110°31.595'	15	JMT	90.0
J7823	4-Oct-78 Unnamed spring	--	--	8	JMT	93.0
SHOSHONE GEYSER BASIN						
T8608	10-Sep-86 Black Sulfur, Shoshone Spring #17	44°21.333'	110°47.799'	n.e.	AHT	94.0
T8604	9-Sep-86 Taurus Spring	*44°21.192'	*110°47.927'	n.e.	AHT	95.0
T8605	9-Sep-86 Unnamed, Shoshone Spring #32A	44°21.392'	110°47.751'	n.e.	AHT	94.5
T8601	9-Sep-86 Unnamed, Shoshone Spring #34	--	--	n.e.	AHT	94.0
T8602	9-Sep-86 Unnamed, Shoshone Spring #67	44°21.262'	110°48.000'	n.e.	A.JT	94.0

Table I: Water Analyses

Sample Number	f pH	pH	Cond. mS/cm	SiO2 mg/L	Al mg/L	Fe(tot) mg/L	Fe(II) mg/L	Fe(III) mg/L	Mn mg/L	As mg/L	Ca mg/L	Mg mg/L	Sr mg/L	Ba mg/L	Na mg/L	K mg/L	Li mg/L	Rb mg/L	Cs mg/L
HEART LAKE GEYSER BASIN																			
Rustic Group																			
J7814	7.4	8.83	--	296	--	--	--	--	--	--	1.85	0.13	--	--	374	10.8	4.8	0.4	0.75
J7811	n.r.	9.27	--	362	--	<0.05	--	--	<0.05	--	0.79	0.02	0.11	0.4	384	9.4	5.1	0.2	0.52
J7812	7.9	8.96	--	339	--	--	--	--	--	--	0.87	0.01	--	--	393	7.7	5.0	0.3	0.54
J7813	n.r.	8.38	--	302	--	--	--	--	--	--	0.83	<0.01	--	--	380	15.5	5.0	0.4	0.16
Lower Group																			
J7815	8.8	9.20	--	269	--	--	--	--	--	--	1.30	0.01	--	--	384	10.0	4.2	0.3	0.45
J7816	8.3	9.53	--	292	--	<0.05	--	--	<0.05	0.80	0.79	0.02	<0.10	0.2	384	9.3	4.3	0.2	0.51
J7817	8.8	9.40	--	288	--	--	--	--	--	--	0.88	0.02	--	--	371	9.7	4.2	0.2	0.50
J7818	n.r.	9.52	--	275	--	<0.05	--	--	<0.05	--	0.75	0.01	0.10	0.9	350	7.9	4.1	0.2	0.49
Middle Group																			
J7819	7.8	8.76	--	203	--	<0.05	--	--	<0.05	--	7.14	0.09	0.10	0.3	294	8.0	3.1	0.3	0.58
J7820	8.6	8.66	--	236	--	<0.05	--	--	<0.05	--	1.64	0.01	0.10	0.2	310	7.8	3.1	0.2	0.54
Fissure Group																			
J7824	9.2	9.57	--	325	--	--	--	--	--	--	0.96	<0.01	--	--	400	21.0	5.4	0.5	0.87
J7825	9.3	9.93	--	345	--	<0.05	--	--	<0.05	--	0.85	<0.01	<0.10	0.3	400	25.2	5.2	0.6	0.75
J7826	9.2	9.75	--	390	--	<0.05	--	--	<0.05	--	1.06	<0.01	<0.10	0.2	350	26.6	4.5	0.5	0.64
J7827	8.5	9.49	--	336	--	--	--	--	--	--	0.97	0.05	0.10	0.2	364	22.1	4.7	0.6	0.67
J7828	7.3	8.28	--	253	--	<0.05	--	--	--	--	2.33	0.04	0.10	0.1	250	30.0	2.8	0.5	0.47
Upper Group																			
J7821	8.3	9.31	--	351	--	<0.05	--	--	<0.05	--	0.93	0.01	<0.10	0.1	382	21.0	6.6	0.5	0.91
J7822	8.9	10.10	--	380	--	<0.05	--	--	<0.05	--	0.79	<0.01	<0.10	0.1	435	32.7	5.7	0.6	0.87
J7823	9.3	9.89	--	358	--	--	--	--	--	--	0.81	<0.01	--	--	420	30.0	5.4	0.6	0.79
SHOSHONE GEYSER BASIN																			
T8608	7.0	8.96	--	252	--	<0.01	--	--	0.01	--	3.92	0.04	--	--	265	10.3	1.5	0.1	0.14
T8604	7.2	8.21	--	313	--	<0.01	--	--	0.01	--	2.30	0.03	--	--	319	14.0	1.3	0.1	0.11
T8605	7.4	8.27	--	331	--	<0.01	--	--	0.01	--	2.21	0.01	--	--	316	15.3	1.6	0.1	0.09
T8601	7.5	8.34	--	284	--	<0.06	--	--	0.02	--	1.12	0.01	--	--	235	26.7	1.2	0.1	0.09
T8602	8.1	8.11	--	284	--	<0.04	--	--	0.02	--	0.99	<0.01	--	--	296	15.5	1.5	0.1	0.12

Table I: Water Analyses

Sample Number	NH4 mg/L	HCO3 mg/L	CO3 mg/L	SO4 mg/L	Cl mg/L	F mg/L	Br mg/L	B mg/L	H2S mg/L	Zn mg/L	Cu mg/L	acidity meq/L	deuterium ‰	O-18 ‰	C-13 ‰	Tritium (TU)	
HEART LAKE GEYSER BASIN																	
Rustic Group																	
J7814	0.9	319	--	164	304	24.7	--	3.4	0.04	<0.01	--	--	-143	-16.9	--	--	--
J7811	0.2	326	--	158	315	23.5	--	3.4	0.02	0.01	0.0032	--	-140	--	--	--	--
J7812	0.7	317	--	166	311	23.5	--	3.2	0.06	<0.01	--	--	-141	--	--	--	--
J7813	0.5	311	--	168	321	25.5	--	3.4	<0.01	<0.01	--	--	-140	--	--	--	--
Lower Group																	
J7815	1.4	**301	--	161	304	25.0	--	3.2	0.1	0.01	--	--	-140	--	--	--	--
J7816	0.8	304	--	149	313	25.5	--	3.3	<0.01	0.01	--	--	-139	--	--	--	--
J7817	0.3	**316	--	154	302	24.2	--	3.0	0.01	0.01	--	--	-141	--	--	--	--
J7818	0.4	311	--	145	273	22.2	--	3.0	0.03	0.01	--	--	--	--	--	--	--
Middle Group																	
J7819	<0.1	251	--	132	242	17.0	--	2.5	<0.01	<0.01	0.0033	--	-140	--	--	--	--
J7820	0.1	264	--	132	235	18.5	--	2.8	<0.01	<0.01	--	--	--	--	--	--	--
Fissure Group																	
J7824	0.2	**294	--	180	351	25.0	--	3.2	<0.01	<0.01	--	--	--	--	--	--	--
J7825	1.3	**326	--	179	354	24.5	--	3.8	1.2	<0.01	--	--	--	--	--	--	--
J7826	0.8	**272	--	151	304	21.0	--	3.2	1.5	<0.01	0.0046	--	-140	--	--	--	--
J7827	--	309	--	129	325	27.5	--	3.6	--	<0.01	--	--	--	--	--	--	--
J7828	--	234	--	138	172	14.8	--	1.9	--	<0.01	--	--	--	--	--	--	--
Upper Group																	
J7821	1.2	306	--	100	365	36.0	--	2.4	1.3	0.025	0.004	--	-140	--	--	--	--
J7822	2.7	**354	--	198	369	23.0	--	3.8	0.9	<0.01	--	--	-142	--	--	--	--
J7823	1.9	**351	--	178	357	24.2	--	3.6	--	<0.01	--	--	--	--	--	--	--
SHOSHONE GEYSER BASIN																	
T8608	--	413	--	54	146	19.0	--	1.3	--	--	--	--	-138	-17.5	--	--	--
T8604	--	430	--	42	203	25.3	--	2.7	--	--	--	--	-137	-17.0	--	--	--
T8605	--	342	--	50	255	23.8	--	3.3	--	--	--	--	-137	-16.7	--	--	--
T8601	--	405	--	39	124	18.7	--	1.4	--	--	--	--	-140	-18.1	--	--	--
T8602	--	436	--	49	174	22.6	--	2.3	--	--	--	--	-138	-17.3	--	--	--

Table I: Water Analyses

Sample Number	Date Name and/or Description	Latitude	Longitude	Discharge (L/min)	Coll.	Temp. (°C)
T8609	10-Sep-86 Unnamed, Shoshone Spring #110	44°21.407'	110°47.943'	n.e. AHT	AHT	91.0
T8610	10-Sep-86 Unnamed, Shoshone Spring #128	--	--	n.e. AHT	AHT	91.0
T8607	10-Sep-86 Unnamed, Shoshone Spring #166	44°21.300'	110°47.562'	n.e. AHT	AHT	92.0
T8606	10-Sep-86 Unnamed, Shoshone Spring #198	44°21.448'	110°47.547'	n.e. AHT	AHT	86.0
T8603	9-Sep-86 Unnamed, Shoshone Spring #199	--	--	n.e. AHT	AHT	92.5
Shoshone Creek						
T8611	11-Sep-86 Shoshone Creek above Shoshone Geyser Basin	--	--	n.e. AHT	AHT	n.r.
T8612	11-Sep-86 Shoshone Creek below Shoshone Geyser Basin	--	--	n.e. AHT	AHT	n.r.
UPPER GEYSER BASIN						
Myriad Group						
J8129	8-Oct-81 "Abuse Spring"	44°27.514'	110°50.055'	good	JMT	87.0
Geyser Hill Group						
J7837	7-Oct-78 Chinaman Spring (Old Faithful Group of Marler, 1973)	*44°26.548'	*110°49.875'	1	JMT	94.0
J7957	11-Oct-79 Chinaman Spring (Old Faithful Group of Marler, 1973)	*44°26.548'	*110°49.875'	2	JMT	94.0
J8123	7-Oct-81 Chinaman Spring (Old Faithful Group of Marler, 1973)	*44°26.548'	*110°49.875'	2	JMT	93.0
J8612	14-Sep-86 Chinaman Spring (Old Faithful Group of Marler, 1973)	*44°26.548'	*110°49.875'	2	JMT	94.0
J7838	7-Oct-78 Ear Spring	*44°27.870'	*110°49.835'	1	JMT	94.0
J7956	11-Oct-79 Ear Spring	*44°27.870'	*110°49.835'	6	JMT	94.0
J8122	7-Oct-81 Ear Spring	*44°27.870'	*110°49.835'	11	JMT	94.0
J8611	14-Sep-86 Ear Spring	*44°27.870'	*110°49.835'	4	JMT	95.0
F9003	1-Sep-90 Ear Spring	*44°27.870'	*110°49.835'	4	JMT	94.0
J8610	14-Sep-86 Solitary Geyser (misc. in Marler, 1973)	*44°28.950'	*110°49.730'	34	JMT	92.0
F9006	1-Sep-90 "Sulfide Spring"	*44°27.780'	*110°49.692'	0.5	JMT	92.0
Middle Group of Geysers and Springs						
J7955	11-Oct-79 Inkwell Spring	*44°28.147'	*110°50.427'	16	JMT	93.0
J7954	11-Oct-79 Morning Glory Pool (Morning Glory Group of Marler, 1973)	*44°28.487'	*110°50.727'	16	JMT	71.0
J8121	7-Oct-81 Morning Glory Pool (Morning Glory Group of Marler, 1973)	*44°28.487'	*110°50.727'	14	JMT	69.0
J8609	14-Sep-86 Morning Glory Pool (Morning Glory Group of Marler, 1973)	*44°28.487'	*110°50.727'	11	JMT	74.0
F9002	1-Sep-90 "S. Scalloped Spring" (Sawmill Group of Marler, 1973)	*44°27.880'	*110°49.220'	2	JMT	91.5
J7952	11-Oct-79 Tortoise Shell Spring (Castle Group of Marler, 1973)	*44°27.832'	*110°50.218'	6	JMT	94.5

Table I: Water Analyses

Sample Number	f pH	l pH	Cond. mS/cm	SiO ₂ mg/L	Al mg/L	Fe(tot) mg/L	Fe(II) mg/L	Fe(III) mg/L	Mn mg/L	As mg/L	Ca mg/L	Mg mg/L	Sr mg/L	Ba mg/L	Na mg/L	K mg/L	Li mg/L	Rb mg/L	Cs mg/L
T8609	8.5	8.71	--	285	--	0.02	--	--	0.01	--	2.85	0.05	--	--	282	15.9	1.7	0.1	0.12
T8610	n.r.	8.11	--	218	--	0.04	--	--	0.01	--	3.60	0.06	--	--	229	9.3	1.1	0.1	0.09
T8607	2.0	2.96	--	410	--	0.20	--	--	0.02	--	2.50	0.37	--	--	72	21.3	0.2	0.2	0.02
T8606	6.7	7.87	--	279	--	<0.01	--	--	0.01	--	1.50	0.01	--	--	159	13.5	0.3	0.1	0.04
T8603	7.4	8.32	--	332	--	0.02	--	--	0.01	--	1.15	0.03	--	--	325	10.7	1.0	0.1	0.11
Shoshone Creek																			
T8611	n.r.	7.01	--	55	--	--	--	--	--	--	2.70	0.24	--	--	26	3.9	0.1	--	--
T8612	n.r.	6.13	--	72	--	--	--	--	--	--	5.72	0.23	--	--	56	4.6	0.2	--	--
UPPER GEYSER BASIN																			
Myriad Group																			
J8129	9.4	9.56	1579	307	0.14	<0.02	--	--	<0.02	--	0.97	0.01	--	--	330	12.7	4.3	0.2	0.40
Geyser Hill Group																			
J7837	7.4	7.82	--	313	--	--	--	--	--	--	0.82	0.07	<0.10	<0.1	308	16.2	4.6	0.2	0.49
J7957	7.0	8.09	--	337	--	<0.03	--	--	<0.02	--	1.07	0.01	<0.50	<1.0	299	26.3	4.6	0.2	0.56
J8123	7.2	8.19	1406	320	0.09	<0.02	--	--	<0.02	--	0.34	0.02	0.09	--	290	4.5	4.9	0.2	0.53
J8612	7.8	7.81	--	327	--	0.01	--	--	0.01	--	2.16	0.02	--	--	299	16.1	4.0	0.3	0.50
J7838	7.2	8.68	--	323	--	--	--	--	--	--	1.27	0.07	0.07	<0.1	320	15.7	5.8	0.3	0.47
J7956	7.7	8.49	--	371	--	<0.03	--	--	<0.02	--	0.82	<0.01	<0.50	<1.0	319	26.8	4.9	0.3	0.57
J8122	7.3	8.69	1431	346	0.06	0.05	--	--	<0.02	--	0.58	0.01	0.10	--	305	12.3	5.1	0.2	0.40
J8611	8.2	8.28	--	352	--	0.04	--	--	0.01	--	0.68	<0.01	--	--	330	13.3	5.0	0.2	0.45
F9003	7.9	8.61	--	241	<0.01	0.04	--	--	<0.01	0.37	0.43	0.01	<0.01	<0.1	274	15.7	4.1	0.2	0.34
J8610	8.5	7.34	--	363	--	0.03	--	--	0.01	--	0.88	0.01	--	--	307	18.5	4.4	0.2	0.24
F9006	6.7	5.43	--	143	<0.01	0.06	--	--	0.03	0.15	4.60	0.43	0.01	<0.1	183	21.6	2.4	0.1	0.15
Middle Group of Geysers and Springs																			
J7955	8.5	9.27	--	281	--	0.04	--	--	<0.02	--	1.01	0.07	<0.50	<1.0	334	45.0	2.8	0.2	0.21
J7954	7.6	8.29	--	279	--	0.04	--	--	0.02	--	0.50	<0.01	<0.50	2.0	382	27.4	3.6	0.1	0.34
J8121	7.5	8.35	1603	271	0.26	<0.02	--	--	<0.02	1.70	0.12	<0.01	0.10	--	375	11.4	4.0	0.1	0.26
J8609	7.7	8.19	--	275	--	0.01	--	--	0.01	--	0.82	0.03	--	--	413	15.0	4.0	0.1	0.30
F9002	7.3	6.41	--	248	<0.01	0.01	--	--	0.01	1.40	0.48	0.03	<0.10	<0.1	334	16.5	3.5	0.1	0.24
J7952	8.7	9.37	--	351	--	0.04	--	--	<0.02	--	0.59	<0.01	1.00	<1.0	384	38.0	4.5	0.2	0.53

Table I: Water Analyses

Sample Number	NH4 mg/L	HCO3 mg/L	CO3 mg/L	SO4 mg/L	Cl mg/L	F mg/L	Br mg/L	B mg/L	H2S mg/L	Zn mg/L	Cu mg/L	acidity meq/L	deuterium ‰	O-18 ‰	C-13 ‰	Tritium (TU)	
T8609	--	452	--	54	158	20.0	--	1.2	--	--	--	--	-137	-17.0	--	--	
T8610	--	324	--	37	141	17.8	--	1.4	--	--	--	--	-138	-17.4	--	--	
T8607	--	0	--	444	73	2.6	--	0.7	--	--	--	7.8	-129	-15.7	--	--	
T8606	--	227	--	55	89	9.5	--	1.0	--	--	--	--	-135	-16.1	--	--	
T8603	--	396	--	47	231	29.0	--	2.8	--	--	--	--	-137	-16.7	--	--	
Shoshone Creek																	
T8611	--	37	--	4	11	2.2	--	1.7	--	--	--	--	-136	-18.3	--	--	
T8612	--	74	--	9	26	3.9	--	1.9	--	--	--	--	-134	-18.0	--	--	
UPPER GEYSER BASIN																	
Myriad Group																	
J8129	1.8	**237	--	11	398	22.1	--	3.5	0.26	--	--	--	--	-15.9	--	--	
Geyser Hill Group																	
J7837	1.1	163	--	25	367	25.0	--	4.2	0.3	<0.01	--	--	-144	-16.4	--	--	
J7957	1.5	153	--	23	387	23.3	--	5.4	0.05	0.04	0.0047	--	-142	-16.2	--	--	
J8123	0.9	172	--	27	384	23.7	--	3.5	0.15	--	--	--	--	-16.2	--	--	
J8612	1.0	145	--	58	385	25.7	--	4.1	0.32	--	--	--	--	--	--	--	
J7838	1.2	174	--	28	409	26.0	--	4.4	0.47	0.31	0.0025	--	-142	-15.7	--	--	
J7956	1.2	146	--	19	415	24.0	--	3.6	1.04	0.04	<0.04	--	-142	-15.4	--	--	
J8122	0.6	178	--	24	410	24.7	--	3.8	0.13	--	--	--	--	-15.5	--	--	
J8611	1.3	158	--	28	409	25.4	--	4.4	0.62	--	--	--	--	--	--	--	
F9003	--	146	--	28	384	25.9	1.5	1.2	0.06	--	--	--	-136	-14.8	--	--	
J8610	1.4	148	--	25	381	28.4	--	4.1	0.9	--	--	--	--	--	--	--	
F9006	--	112	--	32	245	16.0	1.1	2.8	0.25	--	--	--	-130	-14.1	--	--	
Middle Group of Geysers and Springs																	
J7955	0.8	450	--	20	273	23.5	--	4.4	0.06	0.04	0.0037	--	-135	-14.3	--	--	
J7954	0.8	510	--	23	296	25.5	--	2.6	0.05	0.02	0.0047	--	-154	-15.0	--	--	
J8121	0.4	570	--	13	292	28.2	--	2.5	0.05	--	--	--	--	-15.1	--	--	
J8609	0.9	514	--	22	290	28.6	--	2.9	0.115	--	--	--	--	--	--	--	
F9002	--	372	--	20	365	31.1	1.7	4.2	0.06	--	--	--	-137	-15.3	--	--	
J7952	1.1	372	--	22	392	29.5	--	3.4	0.08	<0.02	0.0033	--	-145	-16.2	--	--	

Table I: Water Analyses

Sample Number	Date Name and/or Description	Latitude	Longitude	Discharge (L/min)	Coll.	Temp. (°C)
J8119	7-Oct-81 Tortoise Shell Spring (Castle Group of Marler, 1973)	*44°27.832'	*110°50.218'	46	JMT	95.0
J8608	14-Sep-86 Tortoise Shell Spring (Castle Group of Marler, 1973)	*44°27.832'	*110°50.218'	n.e.	JMT	95.0
Daisy Group						
J7836	7-Oct-78 Punch Bowl Spring	*44°28.152'	*110°50.885'	2	JMT	94.0
J7953	11-Oct-79 Punch Bowl Spring	*44°28.152'	*110°50.885'	9	JMT	94.0
J8120	7-Oct-81 Punch Bowl Spring	*44°28.152'	*110°50.885'	4	JMT	94.0
Cascade Group						
J7842	8-Oct-78 Gem Pool	44°28.772'	110°50.905'	40	JMT	86.0
J8644	22-Sep-86 Unnamed spring, oval shaped, 2m x 3m	--	--	4	JMT	94.0
Black Sand Basin						
F9001	1-Sep-90 Unnamed "Bowtie" spring, Black Sand Basin	44°27.447'	110°50.583'	6	JMT	92.5
Biscuit Basin						
J8402	6-Sep-84 "Rusty Geyser"	*44°29.073'	*110°51.117'	n.e.	JMT	93.0
J8643	22-Sep-86 Sapphire Geyser (Marler, 1973, indicates pool)	*44°29.068'	*110°51.335'	n.e.	JMT	94.0
J8401	6-Sep-84 Unnamed pool above Rusty Geyser	44°29.077'	110°51.069'	n.e.	JMT	73.0
J8007	17-Sep-80 Unnamed warm spring, 2.0km N of Biscuit Basin	44°29.93'	110°50.38'	100	JMT	49.0
Hillside Springs						
J8014	19-Sep-80 Unnamed spring, northern section	44°28.079'	110°52.054'	n.e.	JMT	n.r.
J8013	19-Sep-80 Asta Spring, southern section	44°28.533'	110°51.980'	n.e.	JMT	n.r.
MIDWAY GEYSER BASIN						
Midway Group						
J7840	8-Oct-78 Unnamed superheated spring	44°31.145'	110°49.665'	50	JMT	94.0
Rabbit Creek Group						
J7951	10-Oct-79 Unnamed spring by Y-5 drill hole	*44°33.450'	*110°49.312'	11	JMT	93.0
J8127	8-Oct-81 Unnamed spring by Y-5 drill hole	*44°33.450'	*110°49.312'	23	JMT	93.0
J8642	22-Sep-86 Unnamed spring by Y-5 drill hole	*44°33.450'	*110°49.312'	11	JMT	93.0
F9013	3-Sep-90 Unnamed spring by Y-5 drill hole	*44°33.450'	*110°49.312'	14	JMT	91.5

Table I: Water Analyses

Sample Number	f pH	pH	Cond. mS/cm	SiO2 mg/L	Al mg/L	Fe(tot) mg/L	Fe(II) mg/L	Fe(III) mg/L	Mn mg/L	As mg/L	Ca mg/L	Mg mg/L	Sr mg/L	Ba mg/L	Na mg/L	K mg/L	Li mg/L	Rb mg/L	Cs mg/L	
J8119	8.8	9.38	1726	339	0.11	0.04	--	--	<0.02	2.40	0.62	0.05	0.08	--	376	14.7	4.9	0.1	0.47	
J8608	8.6	8.52	--	348	--	0.01	--	--	0.01	--	0.55	0.03	--	--	403	16.8	4.9	0.2	0.47	
Daisy Group																				
J7836	8.2	8.33	--	312	--	--	--	--	--	--	0.67	0.02	<0.10	<0.1	420	17.4	3.8	0.1	0.28	
J7953	7.4	8.52	--	351	--	0.04	--	--	<0.02	--	0.42	<0.01	<0.50	2.0	413	30.0	3.6	0.2	0.33	
J8120	7.3	8.36	1705	323	0.09	<0.02	--	--	<0.02	1.70	0.19	<0.01	0.09	--	406	7.4	4.0	0.2	0.27	
Cascade Group																				
J7842	8.6	9.11	--	252	--	--	--	--	--	--	0.50	0.10	<0.05	--	379	12.5	3.5	0.8	0.20	
J8644	7.2	8.47	--	338	--	--	--	--	--	--	0.58	<0.01	<0.10	0.2	409	12.0	3.6	0.2	0.21	
Black Sand Basin																				
F9001	8.8	9.32	--	300	<0.01	0.11	--	--	0.01	1.10	0.20	0.03	<0.10	<0.1	347	22.6	2.4	0.1	0.07	
Biscuit Basin																				
J8402	8.2	9.15	--	311	--	0.06	--	--	<0.01	--	0.38	<0.01	--	--	431	15.4	2.6	0.2	0.22	
J8643	8.1	8.71	--	489	--	--	--	--	--	--	1.92	<0.01	<0.10	0.2	435	14.0	2.2	0.2	0.23	
J8401	8.0	8.71	--	306	--	0.01	--	--	<0.01	--	0.76	0.01	--	--	434	15.0	2.6	0.2	0.24	
J8007	6.9	6.90	--	74	--	0.01	--	--	<0.01	--	10.6	0.12	0.03	<0.2	9	3.5	0.0	0.1	0.02	
Hillside Springs																				
J8014	n.r.	7.70	618	182	0.10	0.02	--	--	--	7.80	0.07	0.03	--	<0.1	133	7.6	0.6	0.1	0.07	
J8013	n.r.	7.50	733	179	--	<0.05	--	--	0.02	--	8.94	0.14	0.01	0.1	136	8.0	0.6	0.1	0.08	
MIDWAY GEYSER BASIN																				
Flood Group																				
J7840	8.3	8.71	--	230	--	--	--	--	--	--	1.09	0.01	0.05	<0.1	330	9.9	3.8	0.1	0.26	
Rabbit Creek Group																				
J7951	7.4	8.51	--	226	--	<0.03	--	--	0.02	--	0.78	<0.01	<0.50	<1.0	343	16.0	2.7	0.1	0.35	
J8127	7.4	8.22	1472	213	0.13	<0.02	--	--	<0.02	--	0.19	<0.01	--	--	322	9.1	2.3	0.1	0.26	
J8642	7.4	8.63	--	346	--	--	--	--	--	--	0.08	<0.01	<0.10	0.1	348	8.1	3.0	0.2	0.44	
F9013	6.5	6.86	--	211	<0.01	0.05	--	--	0.02	0.56	0.35	0.00	<0.01	<0.1	360	8.5	2.3	0.1	0.30	

Table I: Water Analyses

Sample Number	NH4 mg/L	HCO3 mg/L	CO3 mg/L	SO4 mg/L	Cl mg/L	F mg/L	Br mg/L	B mg/L	H2S mg/L	Zn mg/L	Cu mg/L	acidity meq/L	deuterium ‰	O-18 ‰	C-13 ‰	Tritium (TU)
J8119	0.8	**422	--	13	388	29.3	--	3.3	0.23	--	--	--	--	-16.6	--	--
J8608	1.4	382	--	25	385	22.8	--	4.1	0.72	--	--	--	--	--	--	--
Daisy Group																
J7836	1.1	450	70	19	289	28.5	--	3.8	0.11	0.03	0.0033	--	-143	-16.6	--	--
J7953	0.6	571	--	16	309	29.5	--	2.6	0.05	0.03	<0.04	--	-142	-16.4	--	--
J8120	0.2	633	--	12	298	29.8	--	2.4	0.08	--	--	--	--	-16.5	--	--
Cascade Group																
J7842	0.8	254	131	13	263	29.0	--	3.5	0.02	0.01	--	--	--	--	--	--
J8644	--	531	--	29	301	31.0	--	3.0	--	--	--	--	--	--	--	--
Black Sand Basin																
F9001	--	**585	--	16	268	26.7	--	3.8	0.49	--	--	--	-143	-17.2	--	--
Biscuit Basin																
J8402	0.1	584	--	14	304	28.0	--	3.3	--	--	--	--	--	--	--	--
J8643	--	593	--	22	315	34.0	--	3.8	--	--	--	--	--	--	--	--
J8401	<0.1	588	--	14	306	29.0	--	3.3	--	--	--	--	--	--	--	--
J8007	--	40	--	8	4	6.3	--	0.1	--	--	--	--	--	--	--	--
Hillside Springs																
J8014	--	254	--	12	71	10.4	--	0.8	--	--	--	--	--	-18.6	--	--
J8013	--	258	--	12	72	10.3	--	1.1	--	--	--	--	--	-18.5	--	16.1
MIDWAY GEYSER BASIN																
Flood Group																
J7840	1.0	221	91	14	258	24.0	--	3.8	0.05	<0.01	0.0025	--	--	--	--	--
Rabbit Creek Group																
J7951	0.7	427	--	18	273	23.5	--	2.4	0.03	<0.02	<0.04	--	-146	-16.7	--	--
J8127	0.3	473	--	6	285	21.9	--	2.5	0.05	--	--	--	--	-16.9	--	--
J8642	--	454	--	21	277	27.0	--	2.7	--	--	--	--	--	-17.5	--	--
F9013	--	429	--	23	258	29.4	1.8	2.6	0.12	--	--	--	-140	-16.1	--	--

Table I: Water Analyses

Sample Number	Date Name and/or Description	Latitude	Longitude	Discharge (L/min)	Coll.	Temp. (°C)
LOWER GEYSER BASIN						
Great Fountain Group						
F9014	3-Sep-90 Surprise Pool	*44°32.105'	*110°48.008'	n.e.	JMT	94.5
Black Warrior Group						
J7950	10-Oct-79 Steady Geyser	*44°32.673'	110°47.198'	n.e.	JMT	93.0
J8128	8-Oct-81 Steady Geyser	*44°32.673'	*110°47.198'	n.e.	JMT	93.0
Nez Perce Creek Group						
T8320	1983 Snort Spring (Camp Group of Marler, 1973)	*44°84.088'	*110°48.375'	n.e.	AHT	n.r.
F9015	3-Sep-90 Snort Spring (Camp Group of Marler, 1973)	*44°84.088'	*110°48.375'	n.e.	JMT	92.0
J7949	10-Oct-79 "Porcupine Hill Geyser," Marler, 1973	*44°34.742'	*110°41.943'	12	JMT	94.5
J8126	8-Oct-81 "Porcupine Hill Geyser," Marler, 1973	*44°34.742'	*110°41.943'	8	JMT	93.0
J8641	22-Sep-86 "Porcupine Hill Geyser," Marler, 1973	*44°34.742'	*110°41.943'	10	JMT	95.0
F9016	3-Sep-90 "Porcupine Hill Geyser," Marler, 1973	*44°34.742'	*110°41.943'	n.e.	JMT	94.5
River Group						
J7948	10-Oct-79 Boulder Spring	44°33.520'	110°50.610'	200	JMT	93.0
J8125	8-Oct-81 Boulder Spring	44°33.520'	110°50.610'	380	JMT	93.0
J7947	10-Oct-79 Ojo Caliente Spring	44°33.770'	110°50.271'	200	JMT	94.0
J8124	8-Oct-81 Ojo Caliente Spring	44°33.770'	110°50.271'	380	JMT	94.0
J8627	17-Sep-86 Ojo Caliente Spring	44°33.770'	110°50.271'	good	JMT	95.0
F9017	3-Sep-90 Ojo Caliente Spring	44°33.770'	110°50.271'	good	JMT	93.5
Imperial Group						
J7839	8-Oct-78 Imperial Geyser	44°31.901'	110°52.514'	huge	JMT	85.0
J8130	9-Oct-81 Imperial Geyser	44°31.901'	110°52.514'	huge	JMT	89.0
J8624	17-Sep-86 Imperial Geyser	44°31.901'	110°52.514'	huge	JMT	86.0
Sentinel Meadows Group						
J8132	9-Oct-81 Queen's Laundry Pool	44°33.816'	110°52.156'	huge	JMT	90.0
J8625	17-Sep-86 Queen's Laundry Pool	44°33.816'	110°52.156'	114	JMT	91.0
J8131	9-Oct-81 Steep Cone Spring	44°33.964'	110°51.771'	30	JMT	96.0
J8626	17-Sep-86 Steep Cone Spring	44°33.964'	110°51.771'	23	JMT	95.0

Table I: Water Analyses

Sample Number	f pH	l pH	Cond. mS/cm	SiO ₂ mg/L	Al mg/L	Fe(tot) mg/L	Fe(II) mg/L	Fe(III) mg/L	Mn mg/L	As mg/L	Ca mg/L	Mg mg/L	Sr mg/L	Ba mg/L	Na mg/L	K mg/L	Li mg/L	Rb mg/L	Cs mg/L
LOWER GEYSER BASIN																			
Lower White Creek Group																			
F9014	8.2	8.78	--	274	--	0.07	--	--	0.03	3.10	0.38	0.00	<0.01	<0.1	342	11.3	2.8	0.1	0.23
Firehole Lake Group																			
J7950	6.6	7.91	--	201	--	<0.03	--	<0.02	<0.02	--	10.8	0.02	<0.50	<1.0	86	21.0	0.4	0.1	0.04
J8128	6.8	8.12	423	193	0.03	<0.02	--	0.09	--	--	10.5	0.03	--	--	76	9.8	0.3	0.3	0.18
Nez Perce Creek Group																			
T8320	n.r.	8.37	--	242	--	--	--	--	--	--	0.96	<0.01	--	--	358	12.8	3.8	--	--
F9015	8.6	8.96	--	221	<0.01	0.10	--	0.03	0.03	1.10	1.24	0.00	<0.01	<0.1	308	9.4	2.7	0.2	0.43
J7949	8.3	9.08	--	284	--	<0.03	--	<0.02	<0.02	--	0.94	<0.01	<0.50	<1.0	329	22.0	3.9	0.2	0.45
J8126	8.7	9.03	1454	267	--	<0.02	--	<0.02	<0.02	--	0.68	<0.01	--	--	313	12.3	3.6	0.3	0.43
J8641	8.8	9.04	--	350	--	--	--	--	--	--	0.31	<0.01	<0.10	0.1	336	11.4	4.3	0.3	0.53
F9016	8.4	9.07	--	272	<0.01	0.09	--	0.03	0.03	1.20	0.57	0.00	<0.01	<0.1	329	11.1	3.2	0.2	0.38
River Group																			
J7948	8.6	9.25	--	208	--	<0.03	--	<0.02	<0.02	--	2.57	<0.01	<0.50	2.0	305	14.1	2.1	0.1	0.30
J8125	8.8	9.03	1333	195	--	<0.02	--	<0.02	<0.02	--	0.58	0.01	--	--	298	7.1	1.9	0.1	0.19
J7947	7.6	8.05	--	233	--	<0.03	--	<0.02	<0.02	--	1.05	0.05	<0.50	2.0	311	15.6	3.7	0.2	0.37
J8124	7.2	8.00	1402	216	--	0.03	--	0.01	0.01	--	0.78	<0.01	--	--	302	9.2	3.4	0.5	0.55
J8627	7.1	7.93	--	229	--	0.03	--	0.01	0.01	--	0.76	0.01	--	--	309	9.7	4.1	0.2	0.34
F9017	7.5	6.11	--	218	<0.01	0.09	--	0.03	0.03	1.70	0.76	<0.01	<0.01	<0.1	323	8.2	2.6	0.2	0.31
Imperial Group																			
J7839	8.7	9.05	--	211	--	<0.05	--	0.05	0.05	--	1.23	0.01	<0.10	<0.1	300	11.7	2.2	0.2	0.26
J8130	8.3	8.98	1208	225	--	0.13	--	0.01	0.01	--	0.74	<0.01	--	--	268	12.7	2.0	0.2	0.24
J8624	8.1	8.41	--	235	--	0.02	--	0.02	0.02	--	4.78	0.35	--	--	311	11.8	2.4	0.1	0.25
Sentinel Group																			
J8132	7.7	8.40	1295	291	--	0.25	--	0.01	0.01	--	0.71	0.01	--	--	285	13.6	1.7	0.2	0.16
J8625	7.4	8.28	--	304	--	0.04	--	0.01	0.01	--	6.11	0.05	--	--	329	11.7	2.0	0.1	0.13
J8131	7.5	8.25	1329	340	--	0.17	--	0.04	0.04	--	0.15	<0.01	--	--	278	9.9	1.4	0.1	0.12
J8626	7.3	8.17	--	350	--	0.01	--	0.01	0.01	--	0.72	0.01	--	--	290	10.1	1.6	0.1	0.08

Table I: Water Analyses

Sample Number	NH4 mg/L	HCO3 mg/L	CO3 mg/L	SO4 mg/L	Cl mg/L	F mg/L	Br mg/L	B mg/L	H2S mg/L	Zn mg/L	Cu mg/L	acidity meq/L	deuterium ‰	O-18 ‰	C-13 ‰	Tritium (TU)
LOWER GEYSER BASIN																
Lower White Creek Group																
F9014	--	349	--	12	290	27.0	1.8	3.0	0.66	--	--	--	-142	-16.5	--	--
Firehole Lake Group																
J7950	0.8	207	--	29	48	11.0	--	0.4	0.04	0.02	0.0014	--	-149	-18.9	--	--
J8128	0.4	152	--	20	46	9.4	--	0.4	0.065	--	--	--	-146	-19.0	--	--
Nez Perce Creek Group																
T8320	--	212	--	30	395	29.7	--	4.4	--	--	--	--	--	--	--	--
F9015	--	87	--	79	326	39.3	1.5	4.2	1.97	--	--	--	-140	-16.4	--	--
J7949	1.6	315	--	23	320	33.5	--	3.4	0.29	0.03	0.0037	--	-143	-16.5	--	--
J8126	1.4	305	--	10	288	32.4	--	3.5	0.45	--	--	--	--	-16.7	--	--
J8641	--	**277	--	32	331	38.0	--	4.7	--	--	--	--	--	--	--	--
F9016	--	268	--	16	304	44.2	1.7	3.9	1.34	--	--	--	-139	-15.6	--	--
River Group																
J7948	2.2	179	--	22	316	30.5	--	3.1	0.29	<0.02	0.0042	--	-144	-16.9	--	--
J8125	1.6	**272	--	13	309	29.4	--	3.3	0.49	--	--	--	--	-17.0	--	--
J7947	1.2	241	--	22	338	30.0	--	3.6	0.11	0.02	0.0075	--	-143	-16.5	--	--
J8124	0.8	259	--	14	318	29.9	--	3.5	0.29	--	--	--	--	-16.6	--	--
J8627	1.1	233	--	28	326	35.0	--	4.2	0.3	--	--	--	--	--	--	--
F9017	--	225	--	15	312	27.0	1.9	3.9	0.28	--	--	--	-134	-14.3	--	--
Imperial Group																
J7839	1.2	74	123	22	205	24.0	--	2.9	0.12	<0.01	--	--	-144	-17.0	--	--
J8130	0.7	421	--	13	204	20.2	--	2.1	0.07	--	--	--	--	-17.0	--	--
J8624	0.7	402	--	27	200	24.7	--	2.8	0.06	--	--	--	--	--	--	--
Sentinel Group																
J8132	0.7	414	--	12	230	23.6	--	2.8	0.07	--	--	--	--	-16.9	--	--
J8625	0.9	375	--	25	235	29.9	--	3.7	0.08	--	--	--	--	--	--	--
J8131	0.8	305	--	7	253	25.9	--	3.0	0.17	--	--	--	--	-17.3	--	--
J8626	1.2	297	--	22	256	31.3	--	3.5	0.15	--	--	--	--	--	--	--

Table I: Water Analyses

Sample Number	Date Name and/or Description	Latitude	Longitude	Discharge (L/min)	Coll.	Temp. (°C)
TERRACE HOT SPRINGS						
J8151	16-Oct-81 Bath Spring	44°33.930'	110°51.780'	11	JMT	42.0
J8152	16-Oct-81 Terrace Hot Spring, main orifice	*44°38.987'	*110°33.930'	huge	JMT	59.0
J8640	22-Sep-86 Terrace Hot Spring, main orifice	*44°38.987'	*110°33.930'	huge	JMT	60.0
GIBBON CANYON SPRINGS						
F9007	2-Sep-90 Beryl Spring	*44°40.790'	*110°44.827'	n.e.	JMT	93.0
J9313	27-Jun-93 Beryl Spring	*44°40.790'	*110°44.827'	good	F&T	91.4
J7849	10-Oct-78 Unnamed spring across river from Monument Trail, 5 ft from Gibbon River	--	--	0.5	JMT	77.0
GIBBON GEYSER BASIN AND ARTIST PAINT POTS						
Artist Paint Pots						
F9010	2-Sep-90 Unnamed spring, north end of trail	44°41.55'	110°44.24'	18	JMT	n.r.
Geyser Creek Basin						
T8312	n.r. Unnamed spring, top level spouter	--	--	n.e.	AHT	92.0
F9008	2-Sep-90 Scalloped Spring, near Rock pile Geyser	*44°41.422'	*110°43.765'	10	JMT	92.0
J9315	27-Jun-93 Scalloped Spring, near Rock Pile Geyser	*44°41.422'	*110°43.765'	n.e.	F&T	91.3
J9314	27-Jun-93 Unnamed spring, 3rd level Scalloped Spg.	44°41.292'	110°43.698'	n.e.	F&T	93.4
F9009	2-Sep-90 Unnamed spring, just below F9008, near Geyser Creek	--	--	8	JMT	88.0
Elk Park Hot Springs						
J7848	10-Oct-78 Unnamed spring, Morning Glory shaped	44°43.177'	110°42.920'	20	J.T	52.0
J7847	10-Oct-78 Unnamed spring, jug shaped, in trees	44°43'	110°42'	6	JMT	76.5
NORRIS GEYSER BASIN						
J7843	10-Oct-78 Unnamed spring, base of Porcelain Terrace	44°43.344'	110°41.958'	15	JMT	93.0
J8003	16-Sep-80 Unnamed spring, base of Porcelain Terrace	44°43.344'	110°41.958'	17	JMT	93.0
J7913	16-Nov-92 Unnamed spring, base of Porcelain Terrace	--	--	>100	RAH	n.r.
J8002	2-Oct-79 Black Spring	--	--	8	JMT	94.0
blue	16-Sep-80 Blue Geyser	--	--	20	JMT	87.0
J7908	3-Aug-81 Blue Geyser	--	--	n.e.	RAH	80.0
	2-Oct-79 Cinder Pool	*44°43.933'	*110°42.602'	n.e.	JMT	87.0

Table I: Water Analyses

Sample Number	f pH	l pH	Cond. mS/cm	SiO2 mg/L	Al mg/L	Fe(tot) mg/L	Fe(II) mg/L	Fe(III) mg/L	Mn mg/L	As mg/L	Ca mg/L	Mg mg/L	Sr mg/L	Ba mg/L	Na mg/L	K mg/L	Li mg/L	Rb mg/L	Cs mg/L
TERRACE HOT SPRINGS																			
J8151	6.8	7.51	1235	150	--	<0.02	--	--	0.25	--	20.0	0.86	--	--	294	31.6	0.6	<0.01	<0.01
J8152	6.2	7.01	1224	144	--	<0.02	--	<0.02	<0.02	--	20.4	0.84	--	--	279	31.7	0.5	<0.01	<0.01
J8640	n.r.	8.39	--	125	--	0.02	--	--	0.12	--	19.8	0.74	0.08	0.9	299	31.1	0.7	0.3	0.12
GIBBON CANYON SPRINGS																			
F9007	6.8	5.94	--	255	<0.01	0.07	--	--	0.01	2.00	3.91	0.01	<0.01	<0.1	414	20.9	5.0	0.3	0.50
J9313	6.8	5.96	--	267	--	0.02	0.000	0.015	0.05	3.60	4.20	0.01	--	--	394	19.2	4.8	0.4	0.77
J7849	2.2	2.28	--	146	--	1.90	--	--	--	--	2.60	0.28	0.08	<0.1	42	9.6	3.0	0.1	0.01
GIBBON GEYSER BASIN AND ARTIST PAINT POTS																			
Artist Paint Pots																			
F9010	8.1	8.52	--	336	<0.01	0.04	--	--	0.01	2.80	3.95	0.01	<0.01	<0.1	325	18.1	4.4	0.3	0.58
Geysers Creek Basin																			
T8312	n.r.	7.78	--	262	--	--	--	--	--	--	1.27	0.12	--	--	56	30.7	0.1	--	--
F9008	6.8	5.66	--	279	<0.01	0.08	--	--	0.01	3.50	5.15	0.01	<0.10	<0.1	422	39.6	5.6	0.6	0.58
J9315	6.4	5.69	2900	282	--	0.01	0.000	0.011	0.04	3.10	5.70	0.00	--	--	414	38.3	5.5	0.7	0.92
J9314	8.5	9.09	2960	264	--	0.01	0.000	0.008	0.05	3.80	0.48	<0.01	--	--	477	23.7	2.6	0.4	0.79
F9009	6.7	5.67	--	222	0.03	0.11	--	--	0.03	2.70	5.08	0.03	<0.01	<0.1	409	27.4	4.4	0.5	0.52
Elk Park Hot Springs																			
J7848	6.5	8.04	--	263	--	--	--	--	--	--	6.85	0.05	<0.10	<0.1	422	20.2	3.2	0.2	0.40
J7847	5.3	6.13	--	252	--	<0.05	--	--	0.20	--	6.55	0.20	0.06	0.1	367	22.2	2.8	0.2	0.34
NORRIS GEYSER BASIN																			
J7843	7.2	7.25	--	583	--	--	--	--	--	--	2.80	0.09	0.15	<0.1	408	88.0	6.1	0.9	0.83
J8003	6.5	7.47	--	576	--	0.01	--	--	<0.01	--	1.98	0.01	0.04	<0.2	355	99.0	5.2	0.7	0.56
J7913	n.r.	6.54	2160	600	--	--	--	--	--	--	2.30	0.01	--	--	429	99.4	5.4	--	--
J8002	4.9	4.34	--	369	--	5.00	--	--	0.04	--	2.10	0.18	<0.50	<1.0	276	137.0	4.2	0.8	0.67
blue	4.3	3.54	--	461	--	0.65	--	--	0.04	--	4.11	0.09	0.04	<0.2	318	93.0	4.4	0.6	0.50
J7908	3.7	4.14	--	329	--	0.28	--	--	0.06	--	1.63	0.11	--	--	281	74.3	5.3	0.7	0.57
									0.03	--	6.30	0.12	<0.50	--	364	81.0	3.9	0.6	0.73

Table I: Water Analyses

Sample Number	NH4 mg/L	HCO3 mg/L	CO3 mg/L	SO4 mg/L	Cl mg/L	F mg/L	Br mg/L	B mg/L	H2S mg/L	Zn mg/L	Cu mg/L	acidity meq/L	deuterium ‰	O-18 ‰	C-13 ‰	Tritium (TU)	
TERRACE HOT SPRINGS																	
J8151	1.2	786	--	7	70	5.6	--	1.7	0.07	--	--	--	--	-18.5	--	--	--
J8152	1.0	775	--	9	65	5.3	--	1.1	0.04	--	--	--	--	-18.9	--	--	--
J8640	--	750	--	16	69	8.4	--	1.0	--	--	--	--	--	--	--	--	--
GIBBON CANYON SPRINGS																	
F9007	--	123	--	96	505	19.0	1.9	7.0	0.57	--	--	--	-138	-14.3	--	--	--
J9313	--	113	--	64	529	14.5	--	4.6	1.52	--	--	--	--	--	--	--	--
J7849	5.2	0	--	389	20	1.8	--	0.4	0.01	0.02	--	5.1	-133	-11.6	--	--	--
GIBBON GEYSER BASIN AND ARTIST PAINT POTS																	
Artist Paint Pots																	
F9010	--	110	--	69	425	14.5	1.5	5.8	0.10	--	--	--	-140	-15.1	--	--	--
Geysers Creek Basin																	
T8312	--	116	--	56	5	3.0	--	0.6	--	--	--	--	--	--	--	--	--
F9008	--	90	--	56	562	14.1	1.9	8.0	0.52	--	--	--	-140	-14.4	--	--	--
J9315	--	77	--	80	592	10.6	--	5.5	2.18	--	--	--	--	--	--	--	--
J9314	--	335	--	340	427	18.7	--	3.7	4.42	--	--	--	--	--	--	--	--
F9009	--	88	--	66	526	17.1	1.9	7.3	0.49	--	--	--	-138	-14.3	--	--	--
Elk Park Hot Springs																	
J7848	0.1	130	--	36	585	13.3	--	8.4	0.01	0.01	--	--	-145	-14.7	--	--	--
J7847	1.4	42	--	87	509	9.7	--	7.6	0.022	0.02	--	--	-140	-12.7	--	--	--
NORRIS GEYSER BASIN																	
J7843	1.9	108	--	10	665	6.4	--	9.9	0.29	<0.01	0.005	--	--	--	--	--	--
J8003	--	50	--	25	639	5.1	--	7.9	--	--	--	--	--	--	--	--	--
J7913	--	34	--	107	674	5.6	--	9.2	--	--	--	--	--	--	--	--	--
J8002	--	7	--	316	520	4.5	--	6.8	--	<0.02	--	5.4	-136	-13.2	--	--	--
blue	--	0	--	82	554	4.2	--	6.7	--	0.04	<0.04	--	--	--	--	--	--
J7908	--	0	--	147	569	6.0	--	8.0	--	0.04	<0.04	1.1	-123	-8.2	--	--	--

Table I: Water Analyses

Sample Number	Date Name and/or Description	Latitude	Longitude	Discharge (L/min)	Coll.	Temp. (°C)
M78	7-Jun-78 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	LJPM	93.0
H7805	11-Jun-78 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	93.0
H7806	9-Jul-78 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	93.0
H7807	25-Aug-78 Cistern Spring after Steamboat eruption, 43cm below water level	*44°43.376'	*110°42.199'	n.e.	RAH	67.0
H7808	11-Sep-78 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	89.5
H7809	10-Oct-78 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	89.5
J7845	10-Oct-78 Cistern Spring	*44°43.376'	*110°42.199'	30	JMT	90.0
H7810	9-Nov-78 Cistern Spring, pool's opalescence much reduced	*44°43.376'	*110°42.199'	n.e.	RAH	90.0
H7811	14-Dec-78 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	89.5
H7901	24-Jan-79 Cistern Spring, turbid water	*44°43.376'	*110°42.199'	n.e.	RAH	90.0
H7902	14-Feb-79 Cistern Spring, turbidity down, discharge up	*44°43.376'	*110°42.199'	n.e.	RAH	90.0
H7903	14-Mar-79 Cistern Spring, turbidity up	*44°43.376'	*110°42.199'	n.e.	RAH	91.5
H7904	10-Apr-79 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	90.0
H7905	11-May-79 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	91.0
H7906	26-Jun-79 Cistern Spring, turbid water	*44°43.376'	*110°42.199'	n.e.	RAH	83.0
H7907	10-Jul-79 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	88.0
H7908	11-Aug-79 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	90.0
H7909	14-Sep-79 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	90.5
J7912	2-Oct-79 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	JMT	87.0
H7910	11-Oct-79 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	89.0
H7911	23-Nov-79 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	88.0
H7912	10-Dec-79 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	n.r.
H8001	11-Jan-80 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	n.r.
H8002	17-Jan-80 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	n.r.
H8003	23-Jan-80 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	n.r.
H8004	30-Jan-80 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	85.5
H8005	7-Feb-80 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	86.5
H8006	21-Feb-80 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	86.5
H8007	4-Mar-80 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	87.0
H8008	17-Mar-80 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	86.5
H8009	10-Apr-80 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	89.0

Table I: Water Analyses

Sample Number	f pH	pH	Cond. mS/cm	SiO2 mg/L	Al mg/L	Fe(tot) mg/L	Fe(II) mg/L	Fe(III) mg/L	Mn mg/L	As mg/L	Ca mg/L	Mg mg/L	Sr mg/L	Ba mg/L	Na mg/L	K mg/L	Li mg/L	Rb mg/L	Cs mg/L
M78	n.r.	7.23	--	584	--	--	--	--	--	--	0.48	0.04	--	--	295	61.0	4.3	0.6	0.53
H7805	n.r.	7.52	--	524	--	--	--	--	--	--	2.03	0.03	<0.10	<0.1	310	55.0	4.2	0.5	0.44
H7806	n.r.	7.49	--	565	--	--	--	--	--	--	2.54	0.05	<0.10	<0.1	352	63.0	4.8	0.6	0.53
H7807	n.r.	6.03	--	620	--	--	--	--	--	--	3.05	0.24	<0.10	<0.1	381	68.0	5.5	0.7	0.56
H7808	n.r.	6.73	--	482	--	--	--	--	--	--	2.65	0.09	<0.10	<0.1	357	59.0	4.9	0.6	0.45
H7809	n.r.	6.87	--	518	--	--	--	--	--	--	2.01	0.02	<0.10	<0.1	338	53.0	4.3	0.5	0.45
J7845	6.2	7.13	--	509	--	--	--	--	--	--	2.10	0.04	0.12	<0.1	330	51.0	4.3	0.5	0.48
H7810	n.r.	7.33	--	593	--	--	--	--	--	--	2.04	0.02	--	--	357	59.8	4.1	0.6	0.39
H7811	n.r.	7.33	--	612	--	--	--	--	--	--	2.10	0.02	--	--	367	66.8	4.4	0.6	0.38
H7901	n.r.	7.40	--	616	--	--	--	--	--	--	2.09	0.03	--	--	346	62.2	3.8	0.6	0.41
H7902	n.r.	6.92	--	577	--	--	--	--	--	--	2.06	0.04	--	--	356	63.8	4.4	0.6	0.33
H7903	n.r.	6.53	--	578	--	--	--	--	--	--	1.95	0.04	--	--	337	61.7	3.9	0.6	0.37
H7904	n.r.	7.59	--	562	--	<0.03	--	<0.02	<0.02	--	2.14	0.02	--	--	316	89.0	4.3	0.6	0.56
H7905	n.r.	7.73	--	553	--	<0.03	--	0.02	0.02	--	1.90	0.02	--	--	300	86.0	4.0	0.6	0.54
H7906	n.r.	7.15	--	517	--	<0.03	--	0.02	0.02	--	2.30	0.04	--	--	332	90.0	4.5	0.6	0.56
H7907	n.r.	7.19	--	562	--	<0.03	--	<0.02	<0.02	--	2.30	0.02	--	--	337	99.0	4.7	0.6	0.58
H7908	n.r.	7.16	--	512	--	<0.03	--	<0.02	<0.02	--	2.50	0.03	--	--	346	98.0	4.9	0.7	0.61
H7909	n.r.	7.19	--	544	--	<0.03	--	<0.02	<0.02	--	5.65	0.03	--	--	364	101.0	5.1	0.7	0.62
J7912	5.8	6.81	--	435	--	0.03	--	<0.02	<0.02	--	1.50	0.02	<0.50	--	229	72.0	2.9	0.5	0.50
H7910	n.r.	6.94	--	546	--	0.03	--	<0.02	1.80	0.35	--	--	--	--	252	70.0	2.8	0.4	0.39
H7911	n.r.	7.15	--	509	--	--	--	--	--	--	2.45	0.03	--	--	391	58.3	4.0	0.4	0.37
H7912	n.r.	6.85	--	365	--	--	--	--	--	--	2.64	0.02	--	--	324	58.6	3.4	0.4	0.45
H8001	n.r.	6.68	--	455	--	--	--	--	--	--	2.09	<0.01	--	--	320	54.2	3.3	0.4	0.45
H8002	n.r.	6.65	--	534	--	--	--	--	--	--	2.04	<0.01	--	--	312	56.5	3.0	0.3	0.39
H8003	5.9	6.58	--	548	--	--	--	--	--	--	2.03	0.01	--	--	320	58.7	3.2	0.5	0.51
H8004	5.7	7.22	--	504	--	0.04	--	<0.01	1.90	<0.01	<0.01	<0.01	--	--	325	62.5	4.3	0.5	0.41
H8005	n.r.	7.39	--	504	--	<0.02	--	<0.01	<0.01	--	1.81	<0.01	<0.10	--	306	61.5	4.1	0.5	0.46
H8006	n.r.	7.33	--	531	--	0.05	--	<0.01	<0.01	--	1.91	<0.01	<0.10	--	314	68.5	4.2	0.5	0.50
H8007	n.r.	7.37	--	531	--	0.06	--	<0.01	<0.01	--	1.69	<0.01	<0.10	--	310	62.9	4.2	0.5	0.49
H8008	n.r.	7.35	--	535	--	0.07	--	<0.01	<0.01	--	1.86	<0.01	<0.10	--	308	60.0	4.1	0.5	0.43
H8009	n.r.	7.18	--	525	--	0.04	--	0.06	0.06	--	2.51	0.02	--	--	332	69.1	4.4	0.4	0.31

Table I: Water Analyses

Sample Number	NH4 mg/L	HCO3 mg/L	CO3 mg/L	SO4 mg/L	Cl mg/L	F mg/L	Br mg/L	B mg/L	H2S mg/L	Zn mg/L	Cu mg/L	acidity meq/L	deuterium ‰	O-18 ‰	C-13 ‰	Tritium (TU)
M78	--	44	--	59	481	4.9	--	7.2	--	--	--	--	--	--	--	--
H7805	--	80	--	64	479	5.1	--	7.1	--	--	--	--	--	-19.0	--	--
H7806	--	48	--	61	561	5.6	--	9.0	--	--	--	--	--	-16.4	--	--
H7807	--	33	--	70	633	6.1	--	9.9	--	--	--	--	--	-18.8	--	--
H7808	--	61	--	55	546	5.6	--	8.2	--	--	--	--	--	-16.4	--	--
H7809	--	66	--	60	516	6.7	--	7.8	--	--	--	--	--	-16.9	--	--
J7845	1.6	61	--	59	489	5.5	--	7.6	0.12	<0.01	0.0053	--	--	--	--	--
H7810	--	59	--	51	561	5.8	--	7.4	--	--	--	--	--	--	--	--
H7811	--	59	--	51	561	5.8	--	7.4	--	--	--	--	--	-18.4	--	--
H7901	--	41	--	57	569	5.6	--	7.3	--	--	--	--	--	--	--	--
H7902	--	48	--	60	559	5.2	--	7.9	--	--	--	--	--	--	--	--
H7903	--	46	--	68	559	5.4	--	7.0	--	--	--	--	--	--	--	--
H7904	--	46	--	71	533	5.2	--	6.5	--	0.03	<0.04	--	--	--	--	--
H7905	--	48	--	84	480	5.1	--	6.3	--	0.04	<0.04	--	--	--	--	--
H7906	--	46	--	70	556	5.3	--	6.8	--	0.03	<0.04	--	--	--	--	--
H7907	--	55	--	61	547	5.5	--	6.8	--	0.03	<0.04	--	--	--	--	--
H7908	--	55	--	61	587	5.5	--	7.1	--	0.02	<0.04	--	--	--	--	--
H7909	--	58	--	64	600	5.8	--	7.0	--	0.03	<0.04	--	--	--	--	--
J7912	2.2	53	--	120	333	4.7	--	5.4	0.08	0.03	<0.04	--	-124	-11.8	--	--
H7910	--	53	--	110	356	5.2	--	5.1	--	0.04	<0.04	--	--	--	--	--
H7911	--	93	--	52	548	4.8	--	7.2	--	--	--	--	--	--	--	--
H7912	--	42	--	47	521	5.3	--	7.9	--	--	--	--	--	--	--	--
H8001	--	37	--	51	529	5.4	--	7.8	--	--	--	--	--	--	--	--
H8002	--	40	--	47	508	5.4	--	7.8	--	--	--	--	--	--	--	--
H8003	--	37	--	50	520	5.6	--	7.8	--	--	--	--	--	--	--	--
H8004	--	41	--	51	519	5.2	--	8.0	--	--	--	--	--	--	--	--
H8005	--	36	--	60	517	5.6	--	8.6	--	--	--	--	--	--	--	--
H8006	--	46	--	62	526	4.9	--	8.6	--	--	--	--	--	--	--	--
H8007	--	46	--	59	515	4.8	--	8.2	--	--	--	--	--	--	--	--
H8008	--	44	--	67	516	4.9	--	8.4	--	--	--	--	--	--	--	--
H8009	--	32	--	80	525	4.9	--	7.7	--	--	--	--	--	--	--	--

Table I: Water Analyses

Sample Number	Date Name and/or Description	Latitude	Longitude	Discharge (L/min)	Coll.	Temp. (°C)
H8010	?-May-80 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	89.0
H8011	22-Jun-80 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	88.5
H8012	12-Jul-80 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	88.0
H8013	10-Aug-80 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	89.0
J8005	16-Sep-80 Cistern Spring	*44°43.376'	*110°42.199'	380	JMT	93.0
H8014	17-Nov-80 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	88.0
H8015	23-Dec-80 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	87.0
H8101	14-Jan-81 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	88.0
H8102	12-Feb-81 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	R.H	88.0
H8103	26-Mar-81 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	88.5
H8104	23-Apr-81 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	n.r.
H8105	9-Jun-81 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	88.0
H8106	10-Jul-81 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	89.0
H8107	3-Aug-81 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	85.0
H8108	11-Aug-81 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	85.0
H8109	15-Nov-81 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	88.0
H8201	12-Jan-82 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	88.5
H8202	10-Feb-82 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	88.0
H8203	11-Mar-82 Cistern Spring, 36 hours after Steamboat eruption, water level down 231cm	*44°43.376'	*110°42.199'	n.e.	RAH	73.0
H8204	20-Apr-82 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	88.0
H8205	10-May-82 Cistern Spring, 23 hours after Steamboat eruption, water level down 282 cm	*44°43.376'	*110°42.199'	n.e.	RAH	66.5
H8206	10-Jun-82 Cistern Spring, 70% of normal flow	*44°43.376'	*110°42.199'	n.e.	RAH	89.0
H8207	11-Jul-82 Cistern Spring, back basin disturbance began 6-Jul-82	*44°43.376'	*110°42.199'	n.e.	RAH	88.0
H8208	14-Aug-82 Cistern Spring, silica deposition estimated at 2mm/70 days	*44°43.376'	*110°42.199'	n.e.	RAH	88.0
H8209	10-Oct-82 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	56.0
H8210	10-Nov-82 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	89.0
H8301	10-Jan-83 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	88.0
H8302	10-Feb-83 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	88.0
H8303	10-Mar-83 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	89.5
H8304	10-May-83 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	89.5
H8305	10-Jun-83 Cistern Spring (poor analysis)	*44°43.376'	*110°42.199'	n.e.	RAH	n.r.

Table I: Water Analyses

Sample Number	f pH	l pH	Cond. mS/cm	SiO ₂ mg/L	Al mg/L	Fe(tot) mg/L	Fe(II) mg/L	Fe(III) mg/L	Mn mg/L	As mg/L	Ca mg/L	Mg mg/L	Sr mg/L	Ba mg/L	Na mg/L	K mg/L	Li mg/L	Rb mg/L	Cs mg/L
H8010	5.9	7.22	--	502	--	0.06	--	--	0.03	--	1.26	0.01	--	--	297	64.8	3.9	0.3	0.29
H8011	5.9	7.28	--	519	--	0.07	--	--	0.06	--	1.50	0.02	--	--	305	69.5	4.3	0.4	0.32
H8012	n.r.	7.52	--	527	--	0.02	--	--	0.05	--	2.78	0.02	--	--	333	73.0	4.5	0.4	0.33
H8013	5.9	7.28	--	511	--	0.04	--	--	0.06	--	2.00	0.02	--	--	348	76.0	4.9	0.4	0.34
J8005	5.4	6.97	--	511	--	0.05	--	--	<0.01	--	4.21	0.04	--	--	352	86.2	4.3	0.5	0.39
H8014	n.r.	7.23	--	477	--	0.06	--	--	0.03	--	2.31	0.02	--	--	349	73.6	4.8	0.3	0.35
H8015	6.8	6.25	--	485	--	0.04	--	--	0.04	--	2.24	0.02	--	--	342	71.5	4.6	0.4	0.31
H8101	n.r.	7.45	--	474	--	0.14	--	--	0.01	--	1.77	0.02	--	--	346	63.0	4.6	0.6	0.52
H8102	5.7	7.49	--	481	--	0.23	--	--	0.01	--	2.37	0.02	--	--	354	68.4	5.0	0.5	0.45
H8103	5.8	7.45	--	480	--	0.21	--	--	0.07	--	4.37	0.05	--	--	350	65.8	5.0	0.5	0.45
H8104	n.r.	7.43	--	493	--	0.12	--	--	0.04	--	2.12	0.02	--	--	344	64.8	4.9	0.5	0.44
H8105	5.8	7.56	--	467	--	0.21	--	--	0.05	--	1.14	0.01	--	--	287	54.3	4.0	0.5	0.38
H8106	5.8	7.57	--	490	--	0.12	--	--	0.04	--	3.55	0.05	--	--	342	64.0	4.9	0.5	0.44
H8107	5.8	7.39	--	443	--	0.18	--	--	0.02	--	1.52	0.01	--	--	338	61.6	4.4	0.5	0.41
H8108	5.6	7.25	--	403	--	0.12	--	--	0.05	--	1.42	0.02	--	--	227	38.3	2.5	0.3	0.22
H8109	6.2	7.37	--	470	--	0.13	--	--	0.03	--	1.80	0.03	--	--	354	63.6	4.9	0.5	0.43
H8201	6.0	7.30	--	542	--	0.19	--	--	0.04	--	1.56	0.01	--	--	350	62.5	4.9	0.5	0.44
H8202	5.9	7.30	--	237	--	<0.05	--	--	0.01	--	2.51	0.12	0.01	--	348	79.7	4.7	0.6	0.50
H8203	n.r.	7.00	--	320	--	0.21	--	--	0.02	--	2.23	0.11	0.01	--	303	64.6	3.8	0.4	0.37
H8204	5.8	7.45	--	462	--	0.19	--	--	<0.01	--	2.24	0.10	0.01	--	300	67.8	3.7	0.5	0.42
H8205	5.1	7.21	--	364	--	0.37	--	--	<0.01	--	1.69	0.08	<0.01	--	283	63.9	3.4	0.4	0.36
H8206	5.8	7.63	--	413	--	0.10	--	--	<0.01	--	3.18	0.10	0.01	--	306	67.1	3.6	0.4	0.41
H8207	5.8	7.71	--	456	--	<0.05	--	--	<0.01	--	1.94	0.07	0.01	--	295	64.4	3.5	0.4	0.40
H8208	5.9	7.86	--	511	--	<0.05	--	--	<0.01	--	2.67	0.06	0.01	--	323	78.5	4.1	0.5	0.44
H8209	5.2	6.33	--	533	--	--	--	--	--	--	1.41	0.07	--	--	189	35.1	2.8	--	--
H8210	5.9	7.71	--	498	--	--	--	--	--	--	2.57	0.04	--	--	300	65.0	4.8	--	--
H8301	5.9	7.92	--	70	--	--	--	--	--	--	2.01	0.03	--	--	320	65.0	4.6	--	--
H8302	n.r.	7.88	--	472	--	--	--	--	--	--	1.81	0.04	--	--	304	62.9	4.7	--	--
H8303	6.1	7.80	--	493	--	--	--	--	--	--	1.69	0.04	--	--	305	65.2	4.6	--	--
H8304	6.0	7.93	--	452	--	--	--	--	--	--	1.46	0.03	--	--	284	58.9	4.3	--	--
H8305	5.8	7.93	--	350	--	--	--	--	--	--	1.02	0.03	--	--	266	44.3	3.7	--	--

Table I: Water Analyses

Sample Number	NH4 mg/L	HCO3 mg/L	CO3 mg/L	SO4 mg/L	Cl mg/L	F mg/L	Br mg/L	B mg/L	H2S mg/L	Zn mg/L	Cu mg/L	acidity meq/L	deuterium ‰	O-18 ‰	C-13 ‰	Tritium (TU)
H8010	--	47	--	87	448	4.6	--	7.2	--	--	--	--	--	--	--	--
H8011	--	51	--	72	488	5.0	--	7.5	--	--	--	--	--	--	--	--
H8012	--	54	--	72	531	5.2	--	7.6	--	--	--	--	--	--	--	--
H8013	--	51	--	70	570	5.5	--	8.1	--	--	--	--	--	--	--	--
J8005	--	32	--	72	568	4.6	--	6.7	--	--	--	--	--	--	--	--
H8014	--	45	--	60	578	5.4	--	8.6	--	--	--	--	--	--	--	--
H8015	--	43	--	70	558	5.2	--	7.4	--	--	--	--	--	--	--	--
H8101	--	44	--	40	551	5.2	--	7.5	--	--	--	--	--	--	--	--
H8102	--	41	--	34	576	5.5	--	7.5	--	--	--	--	--	--	--	--
H8103	--	40	--	42	547	5.6	--	7.6	--	--	--	--	--	--	--	--
H8104	--	43	--	42	535	5.8	--	7.0	--	--	--	--	--	--	--	--
H8105	--	50	--	38	466	4.7	--	6.0	--	--	--	--	--	--	--	--
H8106	--	51	--	60	527	5.1	--	7.0	--	--	--	--	--	--	--	--
H8107	--	44	--	48	555	5.2	--	7.0	--	--	--	--	--	--	--	--
H8108	--	29	--	80	381	4.6	--	5.5	--	--	--	--	--	--	--	--
H8109	--	42	--	38	576	5.4	--	7.6	--	--	--	--	--	--	--	--
H8201	--	45	--	40	572	5.3	--	7.5	--	--	--	--	--	--	--	--
H8202	--	50	--	38	608	5.1	--	7.4	--	--	--	--	--	--	--	--
H8203	--	21	--	82	502	4.4	1.2	6.0	--	--	--	--	--	--	--	--
H8204	--	53	--	52	480	4.4	1.0	5.9	--	--	--	--	--	--	--	--
H8205	--	34	--	84	429	4.1	0.9	5.3	--	--	--	--	--	--	--	--
H8206	--	53	--	62	468	4.3	1.4	5.8	--	--	--	--	--	--	--	--
H8207	--	66	--	74	448	4.2	1.2	5.6	--	--	--	--	--	--	--	--
H8208	--	50	--	48	521	4.8	1.2	6.7	--	--	--	--	--	--	--	--
H8209	--	7	--	40	277	2.4	--	5.4	--	--	--	--	--	--	--	--
H8210	--	36	--	53	542	4.9	--	9.2	--	--	--	--	--	--	--	--
H8301	--	36	--	49	489	4.9	--	8.7	--	--	--	--	--	--	--	--
H8302	--	44	--	59	533	4.8	--	8.1	--	--	--	--	--	--	--	--
H8303	--	33	--	45	560	4.8	--	8.3	--	--	--	--	--	--	--	--
H8304	--	43	--	36	494	4.0	--	7.9	--	--	--	--	--	--	--	--
H8305	--	43	--	56	566	4.6	--	5.7	--	--	--	--	--	--	--	--

Table I: Water Analyses

Sample Number	Date Name and/or Description	Latitude	Longitude	Discharge (L/min)	Coll.	Temp. (°C)
H8306	10-Jul-83 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	89.0
H8307	14-Aug-83 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	88.5
H8308	10-Sep-83 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	87.0
H8309	10-Oct-83 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	88.0
H8310	10-Nov-83 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	88.0
H8401	10-Jan-84 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	86.0
H8402	10-Feb-84 Cistern Spring (poor analysis)	*44°43.376'	*110°42.199'	n.e.	RAH	86.0
H8403	10-Mar-84 Cistern Spring (poor analysis)	*44°43.376'	*110°42.199'	n.e.	RAH	87.0
H8404	12-Apr-84 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	85.0
H8405	15-Aug-84 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	88.0
J8415	11-Sep-84 Cistern Spring	*44°43.376'	*110°42.199'	good	JMT	83.0
H8601	10-Jul-86 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	87.0
H8602	24-Jul-86 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	82.0
H8603	31-Jul-86 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	84.0
H8604	8-Aug-86 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	84.0
H8605	13-Aug-86 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	84.0
H8606	21-Aug-86 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	84.0
H8607	28-Aug-86 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	84.5
H8608	11-Sep-86 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	84.0
J8617	15-Sep-86 Cistern Spring	*44°43.376'	*110°42.199'	good	JMT	85.0
H8609	18-Sep-86 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	RAH	84.0
F9024	6-Sep-90 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	JMT	83.0
J9303	25-Jun-93 Cistern Spring	*44°43.376'	*110°42.199'	n.e.	F&T	82.4
J8115	6-Oct-81 Unnamed, "Collapsed Cave" geyser, surges	--	--	23	JMT	93.0
J8101	4-Oct-81 Unnamed, "Dishwater" spring	--	--	8	JMT	n.r.
M79	11-Jun-78 Echinus Geyser during eruption	*44°43.342'	*110°42.127'	n.e.	LJPM	n.r.
J7846	10-Oct-78 Echinus Geyser during eruption, colloidal SiO2 present	*44°43.342'	*110°42.127'	n.e.	JMT	93.0
E04/79	12-Apr-79 Echinus Geyser during eruption	*44°43.342'	*110°42.127'	n.e.	RAH	93.0
E01/80	23-Jan-80 Echinus Geyser, high analytical error probably caused by acidity	*44°43.342'	*110°42.127'	n.e.	RAH	n.r.
E01/80	30-Jan-80 Echinus Geyser	*44°43.342'	*110°42.127'	n.e.	RAH	88.0
E02/80a	7-Feb-80 Echinus Geyser	*44°43.342'	*110°42.127'	n.e.	RAH	88.0

Table I: Water Analyses

Sample Number	f pH	l pH	Cond. mS/cm	SiO ₂ mg/L	Al mg/L	Fe(tot) mg/L	Fe(II) mg/L	Fe(III) mg/L	Mn mg/L	As mg/L	Ca mg/L	Mg mg/L	Sr mg/L	Ba mg/L	Na mg/L	K mg/L	Li mg/L	Rb mg/L	Cs mg/L
H8306	5.9	7.56	--	434	--	--	--	--	--	--	1.72	0.02	--	--	337	57.9	4.8	--	--
H8307	5.9	7.37	--	603	--	--	--	--	--	--	3.36	0.04	--	--	369	63.0	5.3	--	--
H8308	5.9	7.82	--	486	--	--	--	--	--	--	3.32	0.05	--	--	389	61.0	5.2	--	--
H8309	5.9	7.35	--	517	--	--	--	--	--	--	1.89	0.03	--	--	399	62.4	5.3	--	--
H8310	5.9	7.58	--	531	--	--	--	--	--	--	3.65	0.04	--	--	403	65.1	5.2	--	--
H8401	n.r.	7.62	--	515	--	--	--	--	--	--	3.04	0.05	--	--	323	65.3	5.2	--	--
H8402	5.7	7.43	--	513	--	--	--	--	--	--	2.60	0.03	--	--	333	64.6	4.8	--	--
H8403	5.7	7.53	--	503	--	--	--	--	--	--	2.37	0.04	--	--	317	66.8	4.9	--	--
H8404	5.7	5.06	--	427	0.06	--	--	0.03	1.10	2.00	2.00	0.05	--	--	336	53.3	3.9	0.5	0.38
H8405	5.9	6.44	--	474	0.03	--	--	0.02	1.20	4.20	4.20	0.11	--	--	356	56.5	4.3	0.6	0.43
J8415	6.8	7.31	--	507	--	--	--	--	--	--	1.72	0.03	--	--	315	61.2	4.8	--	--
H8601	5.9	6.36	--	109	0.02	--	--	<0.01	0.60	1.67	1.67	0.02	--	--	320	48.8	3.5	0.5	0.39
H8602	5.9	6.32	--	108	0.02	--	--	<0.01	0.75	1.71	1.71	0.02	--	--	332	60.0	3.9	0.6	0.41
H8603	5.9	6.57	--	138	0.06	--	--	<0.01	1.30	2.09	2.09	0.03	--	--	325	57.1	3.6	0.5	0.39
H8604	5.9	6.88	--	143	0.02	--	--	<0.01	1.50	2.41	2.41	0.03	--	--	332	58.0	3.7	0.5	0.39
H8605	5.9	6.37	--	143	0.04	--	--	<0.01	0.80	3.30	3.30	0.04	--	--	343	60.9	3.9	0.5	0.41
H8606	n.r.	7.16	--	139	0.02	--	--	<0.01	1.30	3.27	3.27	0.05	--	--	328	59.3	3.7	0.5	0.29
H8607	n.r.	6.40	--	142	0.04	--	--	0.01	1.40	3.26	3.26	0.05	--	--	360	59.8	4.0	0.5	0.42
H8608	n.r.	6.75	--	144	0.04	--	--	<0.01	1.40	2.09	2.09	0.03	--	--	333	59.3	4.1	0.5	0.39
J8617	n.r.	6.07	--	489	0.06	--	--	0.04	--	2.42	2.42	0.03	--	--	299	61.4	4.1	0.5	0.38
H8609	5.8	6.18	--	144	0.03	--	--	<0.01	1.70	2.23	2.23	0.03	--	--	333	59.2	3.9	0.5	0.38
F9024	6.2	5.23	--	438	<0.01	0.10	--	<0.01	1.60	1.59	1.59	0.02	0.01	<0.1	309	56.2	2.5	0.5	0.30
J9303	6.3	5.22	--	499	0.04	0.000	0.038	<0.01	0.91	2.51	2.51	0.05	--	--	285	64.4	3.3	0.6	0.56
J8115	4.7	4.03	2180	623	0.57	--	--	0.02	--	1.32	1.32	0.04	0.07	--	362	80.2	6.0	0.8	0.60
J8101	3.8	3.87	1880	431	0.18	--	--	0.04	--	3.44	3.44	0.10	0.11	--	344	53.7	5.4	0.5	0.48
M79	n.r.	3.15	--	250	--	--	--	--	--	4.45	4.45	0.51	<0.10	--	159	49.2	0.8	0.4	0.08
J7846	4.2	3.20	--	278	2.20	--	--	0.20	--	4.90	4.90	0.52	<0.10	--	166	50.1	0.7	0.4	0.09
E04/79	n.r.	3.60	--	361	4.60	--	--	0.12	--	4.94	4.94	0.51	--	--	163	78.0	1.1	--	--
E01/80	n.r.	n.r.	--	318	3.10	2.76	--	0.27	--	4.81	4.81	0.51	--	--	161	46.9	1.1	0.4	0.16
E01/80	4.3	3.36	--	296	6.80	1.75	--	0.14	--	4.60	4.60	0.50	0.02	--	154	47.0	1.0	0.4	0.12
E02/80a	n.r.	3.33	--	173	3.20	1.65	--	0.14	--	4.67	4.67	0.49	--	--	157	47.4	1.0	0.4	0.10

Table I: Water Analyses

Sample Number	NH4 mg/L	HCO3 mg/L	CO3 mg/L	SO4 mg/L	Cl mg/L	F mg/L	Br mg/L	B mg/L	H2S mg/L	Zn mg/L	Cu mg/L	acidity meq/L	deuterium ‰	O-18 ‰	C-13 ‰	Tritium (TU)
H8306	--	26	--	26	585	4.4	--	8.0	--	--	--	--	--	--	--	--
H8307	--	26	--	52	594	4.9	--	8.5	--	--	--	--	--	--	--	--
H8308	--	30	--	57	601	4.3	--	9.0	--	--	--	--	--	--	--	--
H8309	--	23	--	59	604	5.3	--	9.1	--	--	--	--	--	--	--	--
H8310	--	28	--	74	585	4.4	--	8.0	--	--	--	--	--	--	--	--
H8401	--	26	--	78	585	5.2	--	8.1	--	--	--	--	--	--	--	--
H8402	--	20	--	78	629	4.6	--	8.0	--	--	--	--	--	--	--	--
H8403	--	21	--	83	629	5.0	--	7.4	--	--	--	--	--	--	--	--
H8404	--	15	--	111	466	4.0	--	8.3	--	--	--	--	--	--	--	--
H8405	--	26	--	125	534	4.3	--	8.7	--	--	--	--	--	--	--	--
J8415	2.4	34	--	49	555	4.9	--	8.2	--	--	--	--	--	-12.9	--	--
H8601	--	30	--	137	445	4.0	--	7.6	--	--	--	--	-129	-12.9	--	--
H8602	--	28	--	146	457	4.3	--	8.0	--	--	--	--	-129	-12.7	--	--
H8603	--	28	--	140	464	4.2	--	8.4	--	--	--	--	-129	-12.7	--	--
H8604	--	28	--	131	480	4.2	--	8.4	--	--	--	--	-130	-12.6	--	--
H8605	--	28	--	134	471	4.8	--	8.1	--	--	--	--	-130	-12.6	--	--
H8606	--	28	--	136	460	4.9	--	8.1	--	--	--	--	-126	-12.7	--	--
H8607	--	27	--	143	472	4.9	--	8.2	--	--	--	--	-127	-12.6	--	--
H8608	--	29	--	143	487	4.8	--	8.3	--	--	--	--	-124	-12.6	--	--
J8617	1.5	30	--	95	484	6.1	--	8.5	0.24	--	--	--	--	--	--	--
H8609	--	28	--	140	482	4.8	--	7.9	--	--	--	--	-124	-12.7	--	--
F9024	--	29	--	73	440	6.4	1.9	6.9	3.74	--	--	--	-123	-10.7	--	--
J9303	--	22	--	175	468	4.0	--	5.0	2.04	--	--	--	--	--	--	--
J8115	4.1	0	--	74	667	5.4	--	8.8	0.1	--	--	1.9	--	-15.4	--	--
J8101	2.4	0	--	36	618	5.9	--	8.2	0.5	--	--	--	--	-12.7	--	--
M79	--	0	--	317	107	5.5	--	2.5	--	--	--	1.0	--	--	--	--
J7846	2.0	0	--	337	108	5.6	--	3.0	<0.015	0.05	--	0.9	--	--	--	--
E04/79	--	0	--	310	149	5.2	--	2.3	--	0.06	--	1.5	--	--	--	--
E01/80	--	0	--	340	134	5.7	--	2.2	--	--	--	--	--	--	--	--
E01/80	--	0	--	270	141	5.2	--	2.8	--	--	--	1.7	--	--	--	--
E02/80a	--	0	--	265	138	5.3	--	2.7	--	--	--	1.6	--	--	--	--

Table I: Water Analyses

Sample Number	Date Name and/or Description	Latitude	Longitude	Discharge (L/min)	Coll.	Temp. (°C)
E02/80b	21-Feb-80 Echinus Geyser, after eruption	*44°43.342'	*110°42.127'	n.e.	RAH	87.0
E03/80	17-Mar-80 Echinus Geyser, after eruption during drain-back	*44°43.342'	*110°42.127'	n.e.	RAH	88.0
E07/80	12-Jul-80 Echinus Geyser	*44°43.342'	*110°42.127'	n.e.	RAH	86.0
E08/80	10-Aug-80 Echinus Geyser	*44°43.342'	*110°42.127'	n.e.	RAH	90.0
J8004	16-Sep-80 Echinus Geyser	*44°43.342'	*110°42.127'	n.e.	JMT	93.0
E11/80	17-Nov-80 Echinus Geyser	*44°43.342'	*110°42.127'	n.e.	RAH	89.5
E12/80	23-Dec-80 Echinus Geyser	*44°43.342'	*110°42.127'	n.e.	RAH	86.0
E01/81	14-Jan-81 Echinus Geyser	*44°43.342'	*110°42.127'	n.e.	RAH	86.0
E02/81	12-Feb-81 Echinus Geyser	*44°43.342'	*110°42.127'	n.e.	RAH	88.5
E03/81	26-Mar-81 Echinus Geyser	*44°43.342'	*110°42.127'	n.e.	RAH	88.5
E04/81	23-Apr-81 Echinus Geyser	*44°43.342'	*110°42.127'	n.e.	RAH	n.r.
E06/81	9-Jun-81 Echinus Geyser	*44°43.342'	*110°42.127'	n.e.	RAH	87.0
E07/81	10-Jul-81 Echinus Geyser	*44°43.342'	*110°42.127'	n.e.	RAH	90.0
E11/81	11-Aug-81 Echinus Geyser	*44°43.342'	*110°42.127'	n.e.	RAH	91.0
E11/81	15-Nov-81 Echinus Geyser	*44°43.342'	*110°42.127'	n.e.	RAH	90.0
E01/82	12-Jan-82 Echinus Geyser	*44°43.342'	*110°42.127'	n.e.	RAH	87.0
E01/82	14-Jan-82 Echinus Geyser	*44°43.342'	*110°42.127'	n.e.	RAH	89.0
E02/82	10-Feb-82 Echinus Geyser	*44°43.342'	*110°42.127'	n.e.	RAH	88.0
E03/82	11-Mar-82 Echinus Geyser	*44°43.342'	*110°42.127'	n.e.	RAH	89.0
E04/82	20-Apr-82 Echinus Geyser	*44°43.342'	*110°42.127'	n.e.	RAH	88.5
E05/82	10-May-82 Echinus Geyser, water level down 322cm	*44°43.342'	*110°42.127'	n.e.	RAH	92.0
E06/82	10-Jun-82 Echinus Geyser, 35 minute interval, 9.5 minute duration	*44°43.342'	*110°42.127'	n.e.	RAH	89.5
E07/82	11-Jul-82 Echinus Geyser, 7.25 minute duration	*44°43.342'	*110°42.127'	n.e.	RAH	88.0
E08/82	14-Aug-82 Echinus Geyser, 30-35 minute interval, 5-10 minute duration	*44°43.342'	*110°42.127'	n.e.	RAH	89.0
E10/82	10-Oct-82 Echinus Geyser	*44°43.342'	*110°42.127'	n.e.	RAH	n.r.
E11/82	10-Nov-82 Echinus Geyser	*44°43.342'	*110°42.127'	n.e.	RAH	n.r.
E01/83	10-Jan-83 Echinus Geyser	*44°43.342'	*110°42.127'	n.e.	RAH	n.r.
E02/83	10-Feb-83 Echinus Geyser	*44°43.342'	*110°42.127'	n.e.	RAH	n.r.
E03/83	10-Mar-83 Echinus Geyser	*44°43.342'	*110°42.127'	n.e.	RAH	n.r.
E05/83	10-May-83 Echinus Geyser	*44°43.342'	*110°42.127'	n.e.	RAH	n.r.
E11/83	10-Nov-83 Echinus Geyser	*44°43.342'	*110°42.127'	n.e.	RAH	n.r.

Table I: Water Analyses

Sample Number	f pH	l pH	Cond. mS/cm	SiO ₂ mg/L	Al mg/L	Fe(tot) mg/L	Fe(II) mg/L	Fe(III) mg/L	Mn mg/L	As mg/L	Ca mg/L	Mg mg/L	Sr mg/L	Ba mg/L	Na mg/L	K mg/L	Li mg/L	Rb mg/L	Cs mg/L
E02/80b	n.r.	3.30	--	296	3.10	1.68	--	--	0.14	--	4.66	0.49	0.02	--	152	49.0	1.0	0.4	0.11
E03/80	n.r.	3.31	--	296	4.04	1.58	--	--	0.13	--	4.68	0.48	0.02	--	155	52.4	1.0	0.5	0.14
E07/80	n.r.	3.28	--	295	3.47	1.70	--	--	0.36	--	5.16	0.44	0.01	--	168	61.2	1.2	0.4	0.18
E08/80	4.7	3.37	--	298	3.45	1.97	--	--	0.39	--	7.36	0.44	0.01	--	167	56.6	1.2	0.4	0.34
J8004	4.0	3.52	--	290	--	3.88	--	--	0.26	--	4.32	0.42	0.04	--	159	69.0	0.9	0.4	0.12
E11/80	n.r.	3.41	--	291	3.41	1.76	--	--	0.37	--	4.19	0.43	0.01	--	160	54.5	1.1	0.4	0.32
E12/80	3.6	3.42	--	293	3.25	2.10	--	--	0.35	--	3.95	0.40	0.01	--	160	55.3	1.0	0.3	0.15
E01/81	n.r.	3.20	--	285	3.02	2.36	--	--	0.28	--	3.59	0.51	--	--	157	47.6	1.2	0.3	<0.05
E02/81	3.9	3.17	--	285	3.32	2.19	--	--	0.28	--	3.91	0.52	--	--	153	50.1	1.3	0.3	<0.05
E03/81	3.8	3.13	--	292	3.53	2.44	--	--	0.28	--	4.13	0.54	--	--	153	48.5	1.2	0.4	<0.05
E04/81	n.r.	3.06	--	276	4.40	2.47	--	--	0.30	--	6.57	0.60	--	--	150	47.7	1.3	0.4	<0.05
E06/81	3.6	3.09	--	268	4.64	2.46	--	--	0.25	--	4.21	0.54	--	--	150	45.4	0.9	0.3	<0.05
E07/81	3.8	3.08	--	268	2.85	2.90	--	--	0.34	--	4.86	0.56	--	--	151	47.7	0.9	0.3	<0.05
E11/81	3.6	3.10	--	267	--	4.90	--	--	0.34	--	5.44	0.62	--	--	150	49.8	0.9	0.4	<0.05
E11/81	3.8	3.14	--	257	1.64	2.82	--	--	0.33	--	3.66	0.52	--	--	151	45.2	1.0	0.3	<0.05
E01/82	3.6	3.11	--	269	--	2.81	--	--	0.32	--	3.67	0.52	--	--	150	45.9	1.0	0.3	<0.05
E01/82	3.7	3.09	--	268	--	2.87	--	--	0.33	--	3.37	0.52	--	--	149	46.1	1.0	0.3	<0.05
E02/82	3.6	3.38	--	302	2.10	1.73	--	--	0.18	--	4.65	0.55	0.01	--	151	60.0	0.7	0.4	0.10
E03/82	3.8	3.37	--	298	2.30	1.67	--	--	0.18	--	4.62	0.55	0.01	--	150	58.8	0.8	0.4	0.09
E04/82	3.8	3.30	--	290	2.50	1.63	--	--	0.17	--	4.97	0.56	0.01	--	145	58.1	0.7	0.4	0.07
E05/82	3.8	3.35	--	293	4.40	2.39	--	--	0.16	--	4.91	0.55	0.01	--	154	57.2	0.8	0.5	0.18
E06/82	3.8	3.41	--	288	2.10	1.40	--	--	0.17	--	4.86	0.54	0.01	--	152	58.4	0.9	0.4	0.10
E07/82	3.8	3.34	--	288	2.30	1.61	--	--	0.17	--	4.70	0.55	0.01	--	147	60.3	0.8	0.3	0.05
E08/82	3.9	3.33	--	296	2.20	1.54	--	--	0.17	--	5.05	0.56	0.01	--	150	63.4	0.8	0.5	0.11
E10/82	n.r.	3.65	--	290	--	--	--	--	--	--	8.93	0.38	--	--	98	32.7	0.7	--	--
E11/82	n.r.	3.32	--	280	--	--	--	--	--	--	4.22	0.46	--	--	141	49.2	0.9	--	--
E01/83	n.r.	3.26	--	--	--	--	--	--	--	--	4.15	0.45	--	--	133	48.1	0.9	--	--
E02/83	n.r.	3.26	--	279	--	--	--	--	--	--	4.40	0.48	--	--	157	52.8	0.9	--	--
E03/83	n.r.	3.28	--	274	--	--	--	--	--	--	2.37	0.04	--	--	152	48.1	0.9	--	--
E05/83	n.r.	3.31	--	262	--	--	--	--	--	--	4.74	0.56	--	--	158	49.0	0.9	--	--
E11/83	n.r.	3.29	--	171	--	--	--	--	--	--	6.32	0.62	--	--	155	54.8	0.9	--	--

Table I: Water Analyses

Sample Number	NH4 mg/L	HCO3 mg/L	CO3 mg/L	SO4 mg/L	Cl mg/L	F mg/L	Br mg/L	B mg/L	H2S mg/L	Zn mg/L	Cu mg/L	acidity meq/L	deuterium ‰	O-18 ‰	C-13 ‰	Tritium (TU)
E02/80b	--	0	--	264	133	5.0	--	2.5	--	--	--	1.7	--	--	--	--
E03/80	--	0	--	274	141	5.1	--	2.7	--	--	--	1.6	--	--	--	--
E07/80	--	0	--	310	154	5.1	--	2.2	--	--	--	1.4	--	--	--	--
E08/80	--	0	--	210	154	5.0	--	2.0	--	--	--	1.4	--	--	--	--
J8004	--	0	--	270	127	4.4	--	1.8	--	--	--	--	--	--	--	--
E11/80	--	0	--	310	139	4.9	--	1.8	--	--	--	1.6	--	--	--	--
E12/80	--	0	--	310	140	4.9	--	1.8	--	--	--	1.4	--	--	--	--
E01/81	--	0	--	190	148	5.3	--	2.0	--	--	--	2.6	--	--	--	--
E02/81	--	0	--	170	139	5.4	--	2.1	--	--	--	2.6	--	--	--	--
E03/81	--	0	--	170	135	5.4	--	2.5	--	--	--	--	--	--	--	--
E04/81	--	0	--	190	136	5.3	--	1.7	--	--	--	--	--	--	--	--
E06/81	--	0	--	200	121	5.2	--	1.8	--	--	--	--	--	--	--	--
E07/81	--	0	--	220	118	5.5	--	1.8	--	--	--	--	--	--	--	--
E11/81	--	0	--	190	113	5.2	--	1.8	--	--	--	--	--	--	--	--
E11/81	--	0	--	170	125	5.2	--	1.9	--	--	--	--	--	--	--	--
E01/82	--	0	--	180	114	5.1	--	1.9	--	--	--	2.6	--	--	--	--
E01/82	--	0	--	180	116	5.1	--	1.7	--	--	--	2.8	--	--	--	--
E02/82	--	0	--	300	122	5.0	--	1.2	--	--	--	0.8	--	--	--	--
E03/82	--	0	--	300	118	5.0	--	1.4	--	--	--	0.8	--	--	--	--
E04/82	--	0	--	310	110	4.9	--	1.2	--	--	--	0.8	--	--	--	--
E05/82	--	0	--	300	118	4.7	--	2.9	--	--	--	0.8	--	--	--	--
E06/82	--	0	--	285	127	4.8	--	1.5	--	--	--	0.8	--	--	--	--
E07/82	--	0	--	305	108	4.9	--	1.2	--	--	--	0.8	--	--	--	--
E08/82	--	0	--	300	116	5.0	--	2.9	--	--	--	0.8	--	--	--	--
E10/82	--	0	--	120	111	1.9	--	2.9	--	--	--	--	--	--	--	--
E11/82	--	0	--	290	111	4.8	--	2.0	--	--	--	--	--	--	--	--
E01/83	--	0	--	144	116	5.4	--	2.1	--	--	--	--	--	--	--	--
E02/83	--	0	--	285	121	4.8	--	2.6	--	--	--	--	--	--	--	--
E03/83	--	0	--	288	121	4.8	--	1.9	--	--	--	--	--	--	--	--
E05/83	--	0	--	225	121	5.4	--	1.6	--	--	--	--	--	--	--	--
E11/83	--	0	--	285	126	5.1	--	2.2	--	--	--	--	--	--	--	--

Table I: Water Analyses

Sample Number	Date Name and/or Description	Latitude	Longitude	Discharge (L/min)	Coll.	Temp. (°C)
E02/84	10-Feb-84 Echinus Geyser	*44°43.342'	*110°42.127'	n.e.	RAH	n.r.
E03/84	10-Mar-84 Echinus Geyser	*44°43.342'	*110°42.127'	n.e.	RAH	n.r.
E04/84	12-Apr-84 Echinus Geyser, 1m below top of vent	*44°43.342'	*110°42.127'	n.e.	RAH	92.0
E08/84	15-Aug-84 Echinus Geyser	*44°43.342'	*110°42.127'	n.e.	RAH	90.0
J8417	11-Sep-84 Echinus Geyser, during refill	*44°43.342'	*110°42.127'	n.e.	JMT	87.0
J8616	15-Sep-86 Echinus Geyser (balance error caused by acidity)	*44°43.342'	*110°42.127'	n.e.	JMT	n.r.
J9302	25-Jul-93 Echinus Geyser, during eruption (balance error caused by acidity)	*44°43.342'	*110°42.127'	high	F&T	86.0
J7902	30-Sep-79 Emerald Spring	44°43.532'	110°42.211'	4	JMT	92.0
J8006	16-Sep-80 Emerald Spring	44°43.532'	110°42.211'	8	JMT	93.0
J7901	30-Sep-79 Fenner Drill Hole Spring	44°43.277'	110°41.948'	10	JMT	91.0
J8429	12-Sep-84 Fenner Drill Hole Spring	44°43.277'	110°41.948'	8	JMT	90.0
J8623	16-Sep-86 Fenner Drill Hole Spring	44°43.277'	110°41.948'	4	JMT	93.0
J8620	16-Sep-86 Horseshoe Spring	*44°45.002'	*110°42.603'	n.e.	JMT	87.0
F9020	4-Sep-90 Horseshoe Spring (balance error caused by acidity)	*44°45.002'	*110°42.603'	n.o.	JMT	86.2
J9310	26-Jun-93 Horseshoe Spring (balance error caused by acidity)	*44°45.002'	*110°42.603'	n.o.	F&T	87.7
J7911	2-Oct-79 Hydrophane Spring, churning vigorously	--	--	n.e.	JMT	91.5
Hydro	10-Mar-84 North Hydrophane Spring	--	--	2	RAH	83.0
J8421	11-Sep-84 South Hydrophane Spring	--	--	8	JMT	85.0
J8422	11-Sep-84 North Hydrophane Spring	--	--	19	JMT	91.0
J8615	15-Sep-86 Hydrophane Spring	--	--	15	JMT	92.0
J8102	4-Oct-81 Little Alcolve Spring	--	--	2	JMT	93.5
J7910	2-Oct-79 Medusa Spring	44°43.136'	110°42.670'	6	JMT	82.5
J8420	11-Sep-84 Medusa Spring	44°43.136'	110°42.670'	2	JMT	82.0
J8614	15-Sep-86 Medusa Spring	44°43.136'	110°42.670'	4	JMT	85.0
J7909	2-Oct-79 Orpiment Spring	--	--	10	JMT	93.5
J8104	4-Oct-81 Pearl Geyser	44°42.958'	110°42.361'	15	JMT	83.0
J7844	10-Oct-78 Perpetual Spouter, above Firecracker	*44°43.280'	*110°42.517'	5	JMT	93.0
J8618	16-Sep-86 Perpetual Spouter, above Firecracker	*44°43.280'	*110°42.517'	11	JMT	93.5
F9019	4-Sep-90 Perpetual Spouter, above Firecracker	*44°43.280'	*110°42.517'	n.e.	JMT	85.3
J9304	25-Jun-93 Perpetual Spouter, above Firecracker	*44°43.280'	*110°42.517'	n.e.	F&T	86.3
J8423	11-Sep-84 Porkchop Geyser, refilling	*44°43.281'	*110°42.466'	n.e.	JMT	90.0

Table I: Water Analyses

Sample Number	f pH	pH	Cond. mS/cm	SiO2 mg/L	Al mg/L	Fe(tot) mg/L	Fe(II) mg/L	Fe(III) mg/L	Mn mg/L	As mg/L	Ca mg/L	Mg mg/L	Sr mg/L	Ba mg/L	Na mg/L	K mg/L	Li mg/L	Rb mg/L	Cs mg/L
E02/84	n.r.	3.26	--	247	--	--	--	--	--	--	8.79	0.67	--	--	153	53.5	0.9	--	--
E03/84	n.r.	3.26	--	271	--	--	--	--	--	--	5.67	0.58	--	--	153	50.2	0.8	--	--
E04/84	4.0	2.95	--	272	--	--	--	--	0.15	--	5.20	0.50	--	--	159	43.3	1.4	0.4	0.08
E08/84	4.0	3.15	--	271	--	--	--	--	0.16	0.14	6.40	0.19	--	--	177	47.0	0.6	0.4	0.09
J8417	3.5	3.27	--	296	--	--	--	--	--	--	3.62	0.40	--	--	139	49.6	0.9	--	--
J8616	n.r.	3.06	--	287	--	5.32	--	--	0.47	--	4.31	0.52	--	--	148	52.0	0.8	0.4	0.11
J9302	3.4	n.r.	1250	280	--	0.56	0.533	0.023	0.13	<0.10	4.76	0.48	--	--	154	54.9	0.7	0.5	0.15
J7902	4.5	3.84	--	458	--	0.12	--	--	0.04	--	2.60	0.18	<0.50	<1.0	343	70.3	4.0	0.4	0.44
J8006	4.5	3.86	--	464	--	0.17	--	--	<0.01	--	2.15	0.11	0.04	<0.2	327	57.2	3.7	0.4	0.33
J7901	4.7	4.24	--	359	--	0.03	--	--	0.04	--	3.52	0.06	<0.50	<1.0	394	45.3	4.9	0.3	0.36
J8429	4.2	3.78	--	342	--	--	--	--	--	--	2.44	0.06	--	--	341	21.5	4.8	--	--
J8623	4.5	3.39	--	325	--	0.10	--	--	0.04	--	2.72	0.06	--	--	383	20.9	4.7	0.2	0.76
J8620	3.2	2.53	--	323	--	1.25	--	--	0.04	--	2.40	0.21	--	--	213	58.2	2.7	0.4	0.27
F9020	1.9	2.82	--	292	3.94	1.27	--	--	0.03	0.56	2.56	0.18	0.01	0.1	224	52.8	1.9	0.4	0.25
J9310	2.9	2.73	1950	337	--	0.55	0.553	0.000	0.04	0.56	3.16	0.26	--	--	188	56.5	2.3	0.4	0.37
J7911	2.9	3.51	--	296	--	1.24	--	--	0.24	--	4.30	0.42	<0.50	<1.0	221	73.3	3.3	0.5	0.52
Hydro	5.9	7.42	--	534	--	--	--	--	--	--	3.12	0.03	--	--	369	77.6	6.2	--	--
J8421	7.9	7.42	--	636	--	--	--	--	--	--	2.28	0.02	--	--	341	88.4	6.8	--	--
J8422	6.8	7.70	--	590	--	--	--	--	--	--	2.63	0.01	--	--	407	88.8	6.9	--	--
J8615	n.r.	6.37	--	562	--	0.01	--	--	0.02	--	3.42	0.03	--	--	394	96.7	6.3	0.8	0.64
J8102	5.8	5.11	1424	386	--	0.11	--	--	0.13	--	2.56	0.23	0.14	--	270	39.2	3.1	0.3	0.27
J7910	5.6	7.74	--	363	--	<0.02	--	--	0.22	--	3.64	0.09	<0.50	--	318	64.4	3.7	0.5	0.53
J8420	6.7	7.42	--	415	--	--	--	--	--	--	4.03	0.10	--	--	361	56.6	5.7	--	--
J8614	6.2	5.80	--	382	--	0.01	--	--	0.63	--	4.78	0.18	--	--	378	58.7	5.2	0.5	0.49
J7909	3.6	3.69	--	279	--	0.98	--	--	0.07	--	5.57	0.12	<0.50	--	350	60.8	4.6	0.4	0.61
J8104	6.6	7.45	2040	504	--	0.39	--	--	0.02	--	4.35	0.03	0.16	--	370	49.6	5.9	0.6	0.52
J7844	6.7	8.22	--	271	--	<0.05	--	--	0.05	--	6.00	0.07	<0.10	<0.1	352	46.0	4.6	0.4	0.56
J8618	6.8	5.87	--	270	--	0.05	--	--	0.04	--	7.11	0.07	--	--	324	36.5	4.5	0.6	0.47
F9019	5.0	7.70	--	262	<0.01	0.02	--	--	0.01	1.70	5.86	0.03	0.02	<0.1	351	42.9	3.9	0.4	0.48
J9304	7.9	5.77	--	276	--	0.01	0.000	0.005	0.01	1.60	7.90	0.05	--	--	380	51.1	4.6	0.5	0.84
J8423	7.5	8.05	--	552	--	--	--	--	--	--	4.25	0.03	--	--	416	73.5	7.3	--	--

Table I: Water Analyses

Sample Number	NH4 mg/L	HCO3 mg/L	CO3 mg/L	SO4 mg/L	Cl mg/L	F mg/L	Br mg/L	B mg/L	H2S mg/L	Zn mg/L	Cu mg/L	acidity meq/L	deuterium ‰	O-18 ‰	C-13 ‰	Tritium (TU)
E02/84	--	0	--	290	126	4.8	--	2.4	--	--	--	--	--	--	--	--
E03/84	--	0	--	260	121	4.9	--	1.8	--	--	--	--	--	--	--	--
E04/84	--	0	--	260	117	4.3	--	2.2	--	--	--	--	--	--	--	--
E08/84	--	0	--	260	122	3.6	--	2.4	--	--	--	--	--	--	--	--
J8417	1.1	0	--	220	124	5.0	--	2.4	--	--	--	1.0	--	-16.5	--	--
J8616	1.8	0	--	360	117	6.3	--	2.0	0.12	--	--	1.5	--	--	--	--
J9302	--	0	--	291	120	4.2	--	1.3	0.01	--	--	--	--	--	--	--
J7902	5.8	0	--	166	538	4.9	--	8.4	--	<0.02	<0.04	0.4	-125	-10.4	--	--
J8006	--	0	--	90	548	4.0	--	6.7	--	--	--	--	--	--	--	--
J7901	2.0	0	--	127	626	7.6	--	9.1	0.04	<0.02	<0.04	0.30	-140	-14.5	--	--
J8429	1.1	0	--	39	602	7.6	--	11.6	--	--	--	0.8	--	-13.7	--	--
J8623	2.5	0	--	64	596	9.1	--	9.7	0.075	--	--	0.8	--	--	--	--
J8620	2.4	0	--	193	348	2.8	--	5.2	0.10	--	--	2.3	--	--	--	--
F9020	--	0	--	125	372	2.7	2.3	5.0	0.96	--	--	--	-128	-12.0	--	--
J9310	--	0	--	235	371	1.9	--	2.2	1.59	--	--	--	--	--	--	--
J7911	4.2	0	--	144	436	4.0	--	5.6	<0.01	0.04	<0.04	2.2	-131	-12.9	--	--
Hydro	--	40	--	12	704	6.7	--	10.9	--	--	--	--	--	--	--	--
J8421	0.4	65	--	15	711	6.4	--	9.9	--	--	--	--	--	-13.9	--	--
J8422	0.6	56	--	20	694	6.7	--	10.2	--	--	--	--	--	-15.0	--	--
J8615	1.6	53	--	41	683	8.1	--	10.6	0.12	--	--	--	--	--	--	--
J8102	4.5	18	--	39	451	5.9	--	5.9	0.11	--	--	--	--	-14.2	--	--
J7910	2.2	58	--	44	498	4.9	--	6.4	0.16	0.02	<0.04	--	-136	-12.9	--	--
J8420	0.5	36	--	20	643	5.2	--	9.2	--	--	--	--	--	-14.9	--	--
J8614	1.6	21	--	36	643	6.3	--	9.5	0.12	--	--	--	--	--	--	--
J7909	1.4	0	--	39	630	5.0	--	7.6	<0.01	0.04	<0.04	0.7	-149	-15.5	--	--
J8104	1.0	45	--	21	683	6.4	--	9.0	0.07	--	--	--	--	-14.7	--	--
J7844	1.4	46	--	67	509	6.3	--	8.6	0.03	--	--	--	--	--	--	--
J8618	1.0	28	--	95	500	6.7	--	8.2	0.076	--	--	--	--	--	--	--
F9019	--	42	--	57	528	7.9	1.2	8.4	0.7	--	--	--	-137	-13.8	--	--
J9304	--	29	--	54	640	4.7	--	7.4	--	--	--	--	--	--	--	--
J8423	0.2	48	--	17	802	6.1	--	11.0	--	--	--	--	--	-15.1	--	--

Table I: Water Analyses

Sample Number	Date Name and/or Description	Latitude	Longitude	Discharge (L/min)	Coll.	Temp. (°C)
ROF-1	20-Jun-88 Porkchop Geyser	*44°43.281'	*110°42.466'	n.e.	ROF	80.0
Hutch90	22-Jan-90 Porkchop Geyser, after explosion	*44°43.281'	*110°42.466'	n.e.	RAH	n.r.
F9018	4-Sep-90 Porkchop Geyser, after explosion	*44°43.281'	*110°42.466'	n.e.	JMT	89.0
J9305	25-Jun-93 Porkchop Geyser, after explosion	*44°43.281'	*110°42.466'	n.e.	F&T	83.9
J8621	16-Sep-86 Realgar Spring	44°44.068'	110°42.526'	4	JMT	92.0
J8107	4-Oct-81 Recess Pool	--	--	30	JMT	80.0
J7905	2-Oct-79 Realgar Spring	*44°44.157'	*110°42.388'	8	JMT	77.0
J9309	26-Jun-93 North of Sulfur Dust Spring	44°44.157'	110°42.389'	n.e.	F&T	73.0
J8414	11-Sep-84 Steamboat Geyser, preplay	*44°43.475'	*110°42.037'	n.e.	JMT	28.0
J8424	11-Sep-84 Steam Valve Geyser, refilling	--	--	n.e.	JMT	67.5
J7906	2-Oct-79 Verma Spring, yellow sulfur deposit, spiny SiO2	--	--	n.e.	JMT	67.0
J9308	26-Jun-93 Vermillion (balance error caused by acidity)	44°43.668'	110°42.035'	n.e.	JMT	79.6
J8103	4-Oct-81 Yellow Funnel Spring	--	--	2	JMT	62.0
NPorTer	10-Mar-84 Unnamed spring at north end of Porcelain Terrace	*44°43.845'	*110°42.048'	114	RAH	91.0
J8427	12-Sep-84 Unnamed spring at north end of Porcelain Terrace	*44°43.845'	*110°42.048'	8	JMT	91.0
J8622	16-Sep-86 Unnamed spring at north end of Porcelain Terrace	*44°43.845'	*110°42.048'	n.e.	JMT	94.0
F9012	2-Sep-90 Unnamed spg., N end Porcelain Terrace (F9025), during back basin disturbance	*44°43.845'	*110°42.048'	high	JMT	88.0
F9025	6-Sep-90 Unnamed spring, north end Porcelain Terrace, same as F9012	*44°43.845'	*110°42.048'	n.e.	MK	83.0
J9306	25-Jun-93 Unnamed spring, north end of Porcelain Terrace	44°43.847'	*110°42.048'	n.e.	F&T	79.4
J9307	25-Jun-93 Unnamed spring, N end Porcelain Terrace (balance error caused by acidity)	44°43.847'	*110°42.048'	n.e.	F&T	n.r.
J7907	2-Oct-79 Unnamed spring near Verma Spring	--	--	4	JMT	67.0
J8001	14-Sep-80 Unnamed spring near Norris Museum	--	--	3.5	JMT	93.0
J8413	11-Sep-84 Unnamed spring north of Steamboat Geyser	--	--	1	JMT	89.0
J8105	4-Oct-81 Unnamed spring, northwest area, gassy, turquoise color water	--	--	1	JMT	73.0
J8106	4-Oct-81 Unnamed pool, southwest of Porkchop Geyser, near old road	--	--	huge	JMT	79.0
J8108	4-Oct-81 Unnamed spring, near steam vent	--	--	2	JMT	80.0
J8111	6-Oct-81 Unnamed spring, small acidic frying pan, near Realgar	--	--	<1	JMT	89.5
J8112	6-Oct-81 Unnamed spring, yellow-green color, 30' x 15', L shaped	--	--	n.e.	JMT	38.0
J8113	6-Oct-81 Unnamed spring south of Ledge Spring	--	--	19	JMT	65.0
J8114	6-Oct-81 Unnamed pool, closed basin, southwest area	--	--	none	JMT	57.0
J8116	6-Oct-81 Unnamed spring, S55°E to Ledge Geyser, 30m	--	--	2	JMT	78.0

Table I: Water Analyses

Sample Number	f pH	l pH	Cond. mS/cm	SiO2 mg/L	Al mg/L	Fe(tot) mg/L	Fe(II) mg/L	Fe(III) mg/L	Mn mg/L	As mg/L	Ca mg/L	Mg mg/L	Sr mg/L	Ba mg/L	Na mg/L	K mg/L	Li mg/L	Rb mg/L	Cs mg/L
ROF-1	n.r.	7.50	--	--	--	--	--	--	--	--	3.40	0.28	--	--	474	86.1	7.4	--	--
Hutch90	n.r.	8.41	2200	559	0.42	0.02	--	--	0.04	2.80	3.53	0.28	<0.10	<0.1	455	94.5	6.2	0.8	0.91
F9018	7.5	7.91	--	549	<0.01	0.45	--	--	0.04	3.80	3.22	0.03	0.01	<0.1	397	85.5	4.8	0.8	0.62
J9305	8.0	7.30	2780	572	--	0.10	0.044	0.054	<0.01	1.80	3.35	0.01	--	--	365	84.1	5.1	0.9	0.97
J8621	4.3	3.12	--	212	--	0.91	--	--	0.03	--	4.97	0.26	--	--	312	56.8	3.2	0.4	0.39
J8107	4.4	3.34	1879	365	--	0.22	--	--	<0.02	--	5.32	0.05	0.15	--	343	28.5	4.3	0.3	0.48
J7905	3.4	3.89	--	225	--	0.71	--	--	0.02	--	7.35	0.44	<0.50	--	314	79.6	3.2	0.5	0.49
J9309	5.3	5.08	2120	200	--	0.10	0.088	0.012	0.03	1.80	10.2	0.08	--	--	338	42.1	2.4	0.4	0.53
J8414	7.7	7.75	--	527	--	--	--	--	--	--	1.82	0.02	--	--	308	71.8	4.9	--	--
J8424	4.7	6.62	--	344	--	--	--	--	--	--	5.42	0.72	--	--	307	8.8	2.8	--	--
J7906	2.9	3.10	--	254	--	1.55	--	--	0.06	--	4.75	0.23	<0.50	--	223	79.2	2.4	0.3	0.27
J9308	1.8	n.r.	--	260	--	0.58	0.300	0.282	0.07	1.24	1.57	0.66	--	--	27	28.3	0.1	0.2	0.02
J8103	3.5	3.06	2230	462	--	0.33	--	--	0.07	--	2.98	0.08	0.15	--	351	52.9	5.8	0.5	0.50
NPorTer	6.2	7.61	--	625	--	--	--	--	--	--	1.71	0.01	--	--	415	88.2	6.3	--	--
J8427	6.5	7.52	--	635	--	--	--	--	--	--	1.72	0.03	--	--	385	100.2	6.7	--	--
J8622	5.4	4.49	--	538	--	0.06	--	--	0.02	--	1.47	0.01	--	--	413	113.0	6.2	0.8	0.55
F9012	3.2	2.82	--	520	7.12	2.87	--	--	0.03	2.50	1.82	0.21	0.01	<0.1	334	99.5	4.1	0.8	0.48
F9025	6.8	5.36	--	665	0.41	0.10	--	--	0.02	3.20	2.82	0.07	0.01	<0.1	400	112.4	5.4	1.0	0.75
J9306	7.7	6.14	--	458	--	0.04	0.005	0.035	0.02	1.30	2.22	0.01	--	--	372	95.7	5.3	0.9	0.96
J9307	n.r.	2.74	--	334	--	0.15	0.131	0.014	<0.01	0.97	0.92	0.01	--	--	324	97.7	4.0	0.7	0.57
J7907	2.9	3.18	--	268	--	1.04	--	--	0.05	--	4.50	0.15	<0.50	--	239	80.4	2.4	0.3	0.32
J8001	6.8	5.05	--	638	--	0.05	--	--	<0.01	--	2.41	0.01	0.02	<0.2	336	91.9	4.5	0.6	0.46
J8413	3.4	3.02	--	315	--	--	--	--	--	--	0.41	0.08	--	--	19	12.0	0.1	--	--
J8105	5.6	7.09	199	208	--	0.11	--	--	<0.02	--	0.54	0.01	--	--	9	5.1	0.1	0.0	0.04
J8106	4.1	3.06	1919	298	--	1.02	--	--	0.11	--	3.09	0.26	0.16	--	307	72.1	4.6	0.4	0.46
J8108	3.5	2.97	1833	351	--	4.56	--	--	0.18	--	7.81	0.51	0.15	--	263	42.1	3.3	0.4	0.41
J8111	n.r.	2.67	--	140	--	1.19	--	--	0.02	2.60	1.60	0.19	0.13	--	102	23.7	1.4	0.2	0.20
J8112	3.0	2.95	1928	233	--	1.50	--	--	0.04	--	5.53	0.23	0.16	--	259	67.6	3.5	0.5	0.36
J8113	3.6	3.04	2060	259	--	0.93	--	--	0.03	--	2.32	0.07	0.05	--	295	49.6	4.3	0.6	0.58
J8114	4.1	3.19	1433	230	--	1.03	--	--	0.03	--	2.56	0.16	--	--	218	26.3	2.2	0.2	0.25
J8116	4.4	4.94	2030	471	--	0.93	--	--	0.03	--	2.64	0.33	0.08	--	351	69.8	4.3	0.6	0.58

Table I: Water Analyses

Sample Number	NH4 mg/L	HCO3 mg/L	CO3 mg/L	SO4 mg/L	Cl mg/L	F mg/L	Br mg/L	B mg/L	H2S mg/L	Zn mg/L	Cu mg/L	acidity meq/L	deuterium ‰	O-18 ‰	C-13 ‰	Tritium (TU)
ROF-1	--	79	--	48	816	6.5	--	11.2	--	--	--	--	--	--	--	--
Hutch90	--	58	--	85	676	5.7	--	10.3	--	--	--	--	--	--	--	--
F9018	--	60	--	64	651	10.8	2.9	9.7	1.08	--	--	--	-136	-12.9	--	--
J9305	--	49	--	23	668	0.2	--	7.3	1.2	--	--	--	--	--	--	--
J8621	3.4	0	--	134	497	7.4	--	7.8	0.26	--	--	1.1	--	--	--	--
J8107	1.6	0	--	54	562	3.8	--	8.0	0.05	--	--	--	--	-12.6	--	--
J7905	2.6	0	--	121	511	5.0	--	7.0	0.06	0.03	<0.04	0.9	-144	-15.2	--	--
J9309	--	17	--	64	530	5.0	--	5.8	3.9	--	--	--	--	--	--	--
J8414	0.6	57	--	50	547	5.0	--	8.3	--	--	--	--	--	-12.3	--	--
J8424	--	12	--	87	430	4.2	--	6.7	--	--	--	--	--	-11.9	--	--
J7906	2.8	0	--	147	370	2.6	--	5.0	0.02	0.04	<0.04	1.6	-148	-16.7	--	--
J9308	--	0	--	1370	7	0.3	--	3.3	<0.01	--	--	--	--	--	--	--
J8103	1.9	0	--	78	640	5.7	--	8.4	0.04	--	--	--	--	-11.8	--	--
NPorTer	--	66	--	16	705	6.3	--	10.9	--	--	--	--	--	--	--	--
J8427	0.9	47	--	30	740	5.8	--	10.4	--	--	--	--	--	-15.4	--	--
J8622	2.0	7	--	78	671	8.7	--	10.0	0.10	--	--	--	--	--	--	--
F9012	--	0	--	133	527	5.0	2.6	8.4	0.4	--	--	--	-126	-11.1	--	--
F9025	--	32	--	99	634	8.2	2.7	10.1	--	--	--	--	--	--	--	--
J9306	--	52	--	33	665	4.7	--	7.3	1.63	--	--	--	--	--	--	--
J9307	--	0	--	578	584	4.0	--	6.1	1.47	--	--	--	--	--	--	--
J7907	1.9	0	--	150	387	2.6	--	5.3	0.08	0.03	<0.04	1.7	-149	-16.9	--	--
J8001	--	56	--	16	556	4.1	--	6.5	--	--	--	--	--	--	--	--
J8413	--	0	--	54	6	0.6	--	0.2	--	--	--	0.6	--	--	--	--
J8105	1.8	39	--	40	16	1.0	--	0.2	0.06	--	--	--	--	-12.2	--	--
J8106	2.2	0	--	60	562	3.9	--	7.5	0.075	--	--	--	--	-15.3	--	--
J8108	--	0	--	140	415	3.5	--	5.8	--	--	--	0.2	--	-15.3	--	--
J8111	3.0	0	--	304	230	1.2	--	1.8	0.09	--	--	7.5	--	-13.1	--	--
J8112	4.4	0	--	144	451	0.5	--	5.5	0.31	--	--	2.0	--	-14.2	--	--
J8113	<0.1	0	--	75	531	3.5	--	6.6	0.8	--	--	1.7	--	-16.0	--	--
J8114	--	0	--	117	326	4.4	--	4.5	--	--	--	1.6	--	--	--	--
J8116	2.1	11	--	31	623	5.2	--	6.6	0.04	--	--	--	--	-14.5	--	--

Table I: Water Analyses

Sample Number	Date Name and/or Description	Latitude	Longitude	Discharge (L/min)	Coll.	Temp. (°C)
J8117	6-Oct-81 Unnamed spring, southwest of Porcelain Terrace	--	--	4	JMT	90.0
J8118	6-Oct-81 Unnamed spring, south side Crackling Springs Lake	--	--	n.e.	JMT	85.0
J8150	16-Oct-81 Unnamed spring, 2m above Gibbon River, 50m N of campground	--	--	663	JMT	88.0
J8416	11-Sep-84 Unnamed spring between Cistern Spring and Echinus Geyser, S side of trail	--	--	1	JMT	85.0
J8418	11-Sep-84 Unnamed spring above Echinus Geyser	--	--	1	JMT	94.0
J8419	11-Sep-84 Unnamed, "Root" spring	--	--	45	JMT	94.0
J8428	12-Sep-84 Unnamed spring, south of Black Pool, highest discharging spring	--	--	15	JMT	84.0
J8430	12-Sep-84 Unnamed spring in Norris Anex	--	--	<4	JMT	79.0
J9311	26-Jun-93 Unnamed spouter east of Horseshoe	*44°43.992'	*110°42.566'	n.e.	F&T	85.0
J8619	16-Sep-86 Unnamed geyser on island in Tantalus Crk, 50m N10°E from Cinder Pool	44°43.965'	110°42.573'	8	JMT	88.0
J9312	26-Jun-93 Unnamed geyser on island in Tantalus Crk, 50m N10°E from Cinder Pool	44°43.965'	110°42.573'	n.e.	F&T	79.8
MAMMOTH CORRIDOR						
T8302	1983 Roaring Mountain Spring, south side	--	--	seep	AHT	n.r.
MAMMOTH HOT SPRINGS						
J7903	1-Oct-79 Aphrodite Terrace, northwest side	44°58.05'	110°42.76'	high	JMT	74.0
J8109	5-Oct-81 Aphrodite Terrace	44°58.05'	110°42.76'	high	JMT	74.0
J8602	12-Sep-86 Aphrodite Terrace, not much activity left	44°58.05'	110°42.76'	high	JMT	73.5
S715	4-Sep-86 Hot River at source	44°59.11'	110°41.31'	4750	RS	n.r.
S717	4-Sep-86 Hot River at source	44°59.11'	110°41.31'	4750	RS	n.r.
S720B	n.r. Hot River at source	44°59.11'	110°41.31'	huge	RS	n.r.
S723B	n.r. Hot River at source	44°59.11'	110°41.31'	huge	RS	n.r.
J8604	12-Sep-86 Hot River at source	44°59.11'	110°41.31'	huge	JMT	49.0
J7904	1-Oct-79 Minerva Terrace	*44°58.240'	*110°42.320'	high	JMT	74.0
J8110	5-Oct-81 Minerva Terrace	*44°58.240'	*110°42.320'	huge	JMT	64.0
J8603	12-Sep-86 Minerva Terrace	*44°58.240'	*110°42.320'	huge	JMT	75.0
LA DUKE SPRINGS						
J8613	15-Sep-86 La Duke Spring	--	--	38	JMT	54.0
S713	4-Sep-86 La Duke Spring	--	--	n.e.	RS	n.r.
S713B	n.r. La Duke Spring	--	--	n.e.	RS	n.r.

Table I: Water Analyses

Sample Number	f pH	pH	Cond. mS/cm	SiO2 mg/L	Al mg/L	Fe(tot) mg/L	Fe(II) mg/L	Fe(III) mg/L	Mn mg/L	As mg/L	Ca mg/L	Mg mg/L	Sr mg/L	Ba mg/L	Na mg/L	K mg/L	Li mg/L	Rb mg/L	Cs mg/L
J8117	4.0	3.18	2250	321	--	1.40	--	--	0.31	--	6.25	1.04	0.10	--	380	79.7	5.9	0.6	0.49
J8118	6.1	6.33	1765	451	--	0.44	--	--	0.04	--	2.09	0.19	0.09	--	329	56.7	4.9	0.3	0.43
J8150	6.8	7.10	928	166	--	0.18	--	--	1.10	--	22.9	4.21	--	--	170	35.5	1.0	<0.01	<0.01
J8416	3.4	3.13	--	318	--	--	--	--	--	--	1.31	0.25	--	--	91	13.3	1.1	--	--
J8418	6.9	7.73	--	215	--	--	--	--	--	--	0.58	0.03	--	--	84	13.3	0.6	--	--
J8419	3.4	3.01	--	312	--	--	--	--	--	--	3.01	0.32	--	--	151	42.2	1.5	--	--
J8428	6.2	6.27	--	598	--	--	--	--	--	--	1.72	0.04	--	--	374	99.5	6.4	--	--
J8430	2.6	2.53	--	253	--	--	--	--	--	--	1.89	0.24	--	--	206	55.1	1.1	--	--
J9311	3.7	3.51	2020	347	0.29	0.30	0.281	0.009	--	2.80	2.89	0.16	--	--	272	58.3	3.2	0.5	0.58
J8619	4.0	3.05	--	337	--	0.71	--	--	0.05	--	2.52	0.15	--	--	276	69.1	4.0	0.5	0.40
J9312	3.5	3.40	--	321	--	0.30	0.297	0.003	0.04	2.90	2.56	0.15	--	--	240	57.1	2.9	0.5	0.49
MAMMOTH CORRIDOR																			
T8302	n.r.	2.16	--	359	--	--	--	--	--	--	0.43	0.05	--	--	47	30.4	0.0	--	--
MAMMOTH HOT SPRINGS																			
J7903	6.8	7.57	--	57	--	<0.03	--	--	0.03	--	391	72.9	2.00	1.0	114	82.7	1.4	0.4	0.27
J8109	6.7	7.27	1963	52	0.01	0.14	--	--	0.04	0.69	275	69.9	1.89	--	117	52.2	1.4	0.3	0.27
J8602	6.6	7.26	--	107	--	0.03	--	--	0.03	--	334	68.7	1.46	--	130	49.0	1.5	0.4	0.30
S715	n.r.	7.96	--	54	--	--	--	--	--	--	166	74.8	--	--	137	50.7	1.5	--	--
S717	n.r.	7.43	--	46	--	--	--	--	--	--	241	58.2	--	--	101	37.4	1.0	--	--
S720B	n.r.	7.78	--	48	--	--	--	--	--	--	225	60.4	--	--	106	39.7	1.1	--	--
S723B	n.r.	7.90	--	50	--	--	--	--	--	--	177	75.5	--	--	136	47.6	1.5	--	--
J8604	6.1	7.37	--	94	--	0.03	--	--	0.03	--	214	55.7	1.46	--	100	36.8	1.2	0.3	0.21
J7904	6.5	7.28	--	55	--	0.07	--	--	<0.02	--	335	63.4	2.00	--	121	82.6	1.4	0.4	0.28
J8110	7.2	7.78	1895	58	0.01	0.13	--	--	0.02	0.86	261	71.6	1.85	--	115	40.6	1.4	0.3	0.23
J8603	6.9	7.68	--	169	--	0.05	--	--	0.03	--	353	70.0	1.56	--	128	47.4	1.5	0.4	0.28
LA DUKE SPRINGS																			
J8613	7.5	7.76	--	135	--	0.04	--	--	0.02	--	336	59.5	3.54	--	230	20.3	0.3	0.1	0.06
S713	n.r.	7.89	--	47	--	--	--	--	--	--	352	60.0	--	--	232	22.2	0.2	--	--
S713B	n.r.	8.02	--	32	--	--	--	--	--	--	21.3	3.34	--	--	30	5.1	0.1	--	--

Table I: Water Analyses

Sample Number	NH4 mg/L	HCO3 mg/L	CO3 mg/L	SO4 mg/L	Cl mg/L	F mg/L	Br mg/L	B mg/L	H2S mg/L	Zn mg/L	Cu mg/L	acidity meq/L	deuterium ‰	O-18 ‰	C-13 ‰	Tritium (TU)
J8117	4.9	0	--	78	679	3.4	--	8.8	0.06	--	--	0.6	--	-14.4	--	--
J8118	1.9	12	--	80	540	5.0	--	7.1	0.06	--	--	--	--	-14.8	--	--
J8150	3.5	285	--	26	166	1.4	--	3.7	0.11	--	--	--	--	-18.0	--	--
J8416	5.0	0	--	49	147	3.0	--	2.3	--	--	--	0.8	--	-11.3	--	--
J8418	1.5	81	--	90	59	2.7	--	0.8	--	--	--	--	--	-12.9	--	--
J8419	1.8	0	--	204	201	4.1	--	3.3	--	--	--	1.2	--	-15.1	--	--
J8428	1.4	11	--	46	695	5.3	--	10.0	--	--	--	--	--	-15.4	--	--
J8430	--	0	--	230	361	2.8	--	5.6	--	--	--	3.7	--	-16.9	--	--
J9311	--	0	--	77	437	2.7	--	3.5	--	--	--	--	--	--	--	--
J8619	2.8	0	--	157	477	4.5	--	7.3	0.13	--	--	1.2	--	--	--	--
J9312	--	0	--	110	396	3.0	--	3.5	1.03	--	--	--	--	--	--	--
MAMMOTH CORRIDOR																
T8302	--	0	--	660	33	0.3	--	1.7	--	--	--	12.0	--	--	--	--
MAMMOTH HOT SPRINGS																
J7903	3.9	810	--	574	198	3.5	--	3.6	0.095	0.03	<0.04	--	-152	-18.4	--	--
J8109	0.9	641	--	550	162	2.9	--	3.1	0.03	--	--	--	--	-18.3	--	--
J8602	2.5	415	--	780	162	2.5	--	4.5	0.48	--	--	--	-147	-18.3	--	--
S715	--	242	--	600	172	1.9	--	4.4	--	--	--	--	--	--	--	--
S717	--	362	--	480	148	1.4	--	3.3	--	--	--	--	--	--	--	--
S720B	--	264	--	260	132	2.2	--	3.2	--	--	--	--	--	--	--	--
S723B	--	218	--	600	165	1.5	--	4.0	--	--	--	--	--	--	--	--
J8604	--	309	--	516	132	2.9	--	3.5	<0.00	--	--	--	-143	-18.2	-2.1	--
J7904	3.0	815	--	605	163	3.4	--	3.5	0.14	0.02	0.0198	--	-152	-18.4	--	--
J8110	0.9	635	--	570	162	2.5	--	3.1	0.01	--	--	--	--	-18.1	--	--
J8603	1.7	420	--	760	172	2.3	--	4.5	0.72	--	--	--	-148	-18.5	--	--
LA DUKE SPRINGS																
J8613	0.5	170	--	1340	44	4.4	--	<0.1	0.03	--	--	--	-145	-19.3	-4.2	--
S713	--	136	--	1320	50	3.4	--	0.7	--	--	--	--	--	--	--	--
S713B	--	82	--	31	28	0.9	--	0.6	--	--	--	--	--	--	--	--

Table I: Water Analyses

Sample Number	Date Name and/or Description	Latitude	Longitude	Discharge (L/min)	Coll.	Temp. (°C)
S1094	1987 La Duke Spring	--	--	n.e.	RS	n.r.
S1154	13-Apr-87 La Duke Spring	--	--	n.e.	RS	n.r.
LD1	22-Jan-88 La Duke Springs, southern area	--	--	n.e.	WH	n.r.
LD2	22-Jan-88 La Duke Springs, central area	--	--	n.e.	WH	n.r.
LD3	22-Jan-88 La Duke Springs, central area	--	--	n.e.	WH	n.r.
LD4	22-Jan-88 La Duke Springs, northernmost area	--	--	n.e.	WH	n.r.
LD5	22-Jan-88 La Duke Springs, directly south of La Duke Spring	--	--	n.e.	WH	n.r.
LD6	22-Jan-88 La Duke Proper, pool where water discharges from box	--	--	n.e.	WH	n.r.
S719	5-Sep-86 Miller Well	--	--	n.e.	RS	n.r.
S1092	n.r. Miller Well	--	--	n.e.	RS	n.r.
S1151	13-Apr-87 Miller Well	--	--	n.e.	RS	n.r.
DUW1	15-Dec-87 Miller Well?, 197ft down casing, water level 75ft	--	--	n.e.	JC	28.0
RCF	15-Dec-87 Reese Creek (warm mineral spring) (Ca not preserved)	--	--	n.e.	JC	6.1
WASHBURN SPRINGS						
Lower Group						
J7808	29-Sep-78 Unnamed spring, 25m due west of Inkpot	44° 14' 00"	110° 25' 804"	1	JMT	88.0
J7809	29-Sep-78 Unnamed pool, 75m west of Inkpot	--	--	2	JMT	88.0
Upper Group						
J7806	29-Sep-78 Unnamed spring, 2nd drainage from west margin, monoclinic sulfur crystals	--	--	1	JMT	82.0
J7807	29-Sep-78 Unnamed spring, 4th drainage from western margin, oblong vent	--	--	4	JMT	87.0
MIRROR PLATEAU BASINS						
Ponuntipa Springs						
J8143	13-Oct-81 Ponuntipa Spring	44° 40' 681"	110° 14' 821"	4	JMT	66.0
J8144	13-Oct-81 Ponuntipa Springs Group, small spring, elevation 8250 ft	--	--	seep	JMT	53.0
J8145	13-Oct-81 Ponuntipa Springs Group, large pool w/scalloped sinter rim, SE end of meadow	--	--	3	JMT	53.0
Fern Lake Area						
J8146	13-Oct-81 Fern Lake Hot Spring, southwest side, elevation 8270 ft.	--	--	8	JMT	50.0
J8147	13-Oct-81 Fern Lake Outlet (creek)	--	--	13,600	JMT	10.5

Table I: Water Analyses

Sample Number	f pH	l pH	Cond. mS/cm	SiO2 mg/L	Al mg/L	Fe(tot) mg/L	Fe(II) mg/L	Fe(III) mg/L	Mn mg/L	As mg/L	Ca mg/L	Mg mg/L	Sr mg/L	Ba mg/L	Na mg/L	K mg/L	Li mg/L	Rb mg/L	Cs mg/L
S1094	n.r.	7.54	--	47	--	--	--	--	--	-- 336	59.1	--	--	--	231	23.2	0.2	--	--
S1154	n.r.	7.66	--	45	--	--	--	--	--	-- 345	59.4	--	--	--	236	22.7	0.2	--	--
LD1	n.r.	6.24	--	71	--	--	--	--	--	-- 292	55.8	--	--	--	204	18.9	0.3	--	--
LD2	n.r.	6.07	--	67	--	--	--	--	--	-- 313	55.9	--	--	--	217	20.3	0.3	--	--
LD3	n.r.	6.62	--	63	--	--	--	--	--	-- 288	56.3	--	--	--	204	18.8	0.3	--	--
LD4	n.r.	6.20	--	40	--	--	--	--	--	-- 170	62.1	--	--	--	129	11.4	0.2	--	--
LD5	n.r.	6.70	--	55	--	--	--	--	--	-- 330	59.3	--	--	--	215	19.6	0.3	--	--
LD6	n.r.	6.53	--	56	--	--	--	--	--	-- 336	55.2	--	--	--	220	19.2	0.3	--	--
S719	n.r.	7.75	--	58	--	--	--	--	--	-- 92.7	86.0	--	--	--	307	25.4	0.1	--	--
S1092	n.r.	8.41	--	58	--	--	--	--	--	-- 87.5	83.9	--	--	--	290	26.0	0.1	--	--
S1151	n.r.	8.23	--	56	--	--	--	--	--	-- 82.8	83.8	--	--	--	293	26.2	0.1	--	--
DUW1	n.r.	6.75	--	21	--	0.60	--	--	0.02	-- 92.3	48.0	--	--	--	54	6.4	0.1	--	--
RCF	7.2	7.81	--	35	--	11.1	--	--	0.44	-- 4.72	1.86	--	--	--	209	1.4	0.2	--	--
WASHBURN SPRINGS																			
Lower Group																			
J7808	6.5	7.75	--	224	--	0.05	--	--	<0.05	-- 2.80	1.02	1.02	<0.10	--	30	6.1	0.1	0.1	0.11
J7809	5.7	5.65	--	135	--	0.05	--	--	0.13	-- 24.0	12.7	0.20	0.20	--	28	5.9	0.0	0.1	0.12
Upper Group																			
J7806	6.0	6.57	--	197	--	0.06	--	--	0.18	-- 3.45	12.2	0.20	0.20	--	20	5.0	0.0	0.1	0.10
J7807	4.0	3.17	--	266	--	0.50	--	--	0.17	-- 2.43	9.80	--	--	--	16	2.0	0.0	0.1	0.16
MIRROR PLATEAU BASINS																			
Ponuntpa Springs																			
J8143	6.8	7.23	2850	216	--	0.14	--	--	0.07	-- 7.99	1.43	--	--	--	531	20.7	0.4	<0.01	0.04
J8144	6.8	7.32	1565	220	--	0.08	--	--	0.02	-- 3.80	0.29	--	--	--	376	14.0	0.6	<0.01	0.05
J8145	6.8	7.15	1740	221	--	<0.02	--	--	0.08	-- 7.35	0.59	--	--	--	425	19.4	0.5	<0.01	<0.01
Fern Lake Area																			
J8146	5.0	5.41	975	186	--	2.65	--	--	0.59	-- 77.0	22.4	--	--	--	84	27.5	0.1	<0.01	<0.01
J8147	5.5	4.29	175	58	--	0.18	--	--	0.02	-- 4.15	1.05	--	--	--	27	7.8	0.0	<0.01	<0.01

Table I: Water Analyses

Sample Number	NH4 mg/L	HCO3 mg/L	CO3 mg/L	SO4 mg/L	Cl mg/L	F mg/L	Br mg/L	B mg/L	H2S mg/L	Zn mg/L	Cu mg/L	acidity meq/L	deuterium ‰	O-18 ‰	C-13 ‰	Tritium (TU)
S1094	--	211	--	1440	50	2.5	--	1.4	--	--	--	--	--	--	--	--
S1154	--	189	--	1020	45	4.1	--	<0.1	--	--	--	--	--	--	--	--
LD1	--	337	--	1180	41	3.4	--	10.1	--	--	--	--	--	--	--	--
LD2	--	307	--	1160	44	3.7	--	2.1	--	--	--	--	--	--	--	--
LD3	--	319	--	1150	41	3.4	--	2.1	--	--	--	--	--	--	--	--
LD4	--	351	--	753	26	1.8	--	1.8	--	--	--	--	--	--	--	--
LD5	--	314	--	1320	46	3.8	--	2.2	--	--	--	--	--	--	--	--
LD6	--	285	--	1420	45	3.8	--	2.2	--	--	--	--	--	--	--	--
S719	--	251	--	1080	38	1.5	--	0.8	--	--	--	--	--	--	--	--
S1092	--	250	--	990	40	1.5	--	0.8	--	--	--	--	--	--	--	--
S1151	--	245	--	930	35	1.9	--	0.9	--	--	--	--	--	--	--	--
DUW1	--	352	--	259	14	5.1	--	0.2	--	--	--	--	--	--	--	--
RCF	--	987	--	37	1	5.4	--	0.1	--	--	--	--	--	--	--	--
WASHBURN SPRINGS																
Lower Group																
J7808	400.0	122	--	943	24	1.3	--	0.6	0.1	<0.01	--	--	-117	-6.9	--	--
J7809	550.0	80	--	1270	4	0.2	--	0.1	0.01	<0.01	--	--	-116	-4.4	--	--
Upper Group																
J7806	625.0	45	--	1800	5	0.1	--	3.9	0.25	<0.01	--	--	-118	-4.5	--	--
J7807	875.0	0	--	2860	2	0.3	--	9.4	0.02	<0.01	--	6.4	-120	-6.7	--	--
MIRROR PLATEAU BASINS																
Ponuntpa Springs																
J8143	1.7	1046	--	1	295	6.3	--	7.8	0.065	--	--	--	--	-16.6	--	--
J8144	--	713	--	21	212	8.5	--	6.3	--	--	--	--	--	-17.0	--	--
J8145	1.9	824	--	8	223	6.9	--	6.3	<0.01	--	--	--	--	-17.1	--	--
Fern Lake Area																
J8146	5.8	44	--	481	4	0.5	--	0.3	0.08	--	--	--	--	-17.7	--	--
J8147	0.6	0	--	56	21	1.4	--	0.6	0.01	--	--	--	--	--	--	--

Table I: Water Analyses

Sample Number	Date Name and/or Description	Latitude	Longitude	Discharge (L/min)	Coll.	Temp. (°C)
Astringent Creek Thermal Area						
J8148	14-Oct-81 Unnamed spring, southwest side of Astringent Creek	--	--	23	JMT	90.0
J8149	14-Oct-81 Unnamed spring, small cone, west side of Astringent Creek	--	--	15	JMT	61.0
Rainbow Hot Springs						
H7913	30-Sep-79 Unnamed spring, Hutchinson's Spring No. 4	*44°46.04'	110°15.94'	20	RAH	79.5
J8135	11-Oct-81 Unnamed spring, Hutchinson's Spring No. 4	*44°46.04'	110°15.94'	21	JMT	79.0
H7914	30-Sep-79 Unnamed spring, Hutchinson's Spg. No.36 (balance error caused by acidity)	--	--	208	RAH	52.0
H7915	30-Sep-79 Unnamed spring, Hutchinson's Spg. No.45 (balance error caused by acidity)	--	--	110	RAH	75.0
J8133	11-Oct-81 Unnamed spring, Hutchinson's Spring No.45, iron stains on sinter	--	--	n.e.	JMT	75.0
J8136	11-Oct-81 Unnamed spring, Hutchinson's Spring No. 37	--	--	n.e.	JMT	52.0
J8137	11-Oct-81 Unnamed spring, Hutchinson's Spring No. 43	--	--	27	JMT	77.0
J8134	11-Oct-81 Unnamed spring, Hutchinson's Spring No. 44	--	--	17	JMT	81.0
Hot Springs Basin						
J8138	12-Oct-81 Unnamed spring, fallen tree over orifice	--	--	38	JMT	89.0
F8405	5-Sep-84 Unnamed spring, same as J8138	--	--	n.e.	ROF	89.0
J8139	12-Oct-81 Unnamed spring, little spouter, iron stained sinter	--	--	6	JMT	88.0
J8140	12-Oct-81 Unnamed spring, west part, very gassy	--	--	42	JMT	88.0
J8141	12-Oct-81 Unnamed spring, north end main basin, cemented kames at hillside	--	--	23	JMT	93.0
F8406	5-Sep-84 Unnamed spring, same as J8141	--	--	n.e.	ROF	92.7
J8142	12-Oct-81 Unnamed spring, southwest part, sulfur deposition, gassy	--	--	<1	JMT	78.0
F8407	5-Sep-84 Unnamed spring, same as J8142	--	--	n.e.	ROF	87.9
F8401	5-Sep-84 Unnamed spring	--	--	n.e.	ROF	85.7
F8402	5-Sep-84 Unnamed spring	--	--	n.e.	ROF	27.0
F8403	5-Sep-84 Unnamed spring	--	--	n.e.	ROF	91.6
F8404	5-Sep-84 Unnamed spring	--	--	n.e.	ROF	86.0
Confluence of Broad and Shallow Creeks						
HBS8001	25-Jun-80 Confluence of Broad and Shallow Creeks, #1	44°47.1'	110°19.1'	n.e.	RAH	81.0
HBS8002	25-Jun-80 Confluence of Broad and Shallow Creeks, #2	44°47.1'	110°19.1'	n.e.	RAH	90.0
H83c12	9-Sep-83 Confluence of Broad and Shallow Creeks	44°47.1'	110°19.1'	225	RAH	91.0
H83c41	9-Sep-83 Confluence of Broad and Shallow Creeks	44°47.1'	110°19.1'	23	RAH	90.0
H83c57	9-Sep-83 Confluence of Broad and Shallow Creeks	44°47.1'	110°19.1'	114	RAH	82.5

Table I: Water Analyses

Sample Number	f pH	pH	Cond. mS/cm	SiO2 mg/L	Al mg/L	Fe(tot) mg/L	Fe(II) mg/L	Fe(III) mg/L	Mn mg/L	As mg/L	Ca mg/L	Mg mg/L	Sr mg/L	Ba mg/L	Na mg/L	K mg/L	Li mg/L	Rb mg/L	Cs mg/L
Astringent Creek Thermal Area																			
J8148	6.8	7.49	1065	203	--	0.17	--	--	0.04	--	33.3	7.84	--	--	202	32.8	0.3	<0.01	<0.01
J8149	5.9	6.62	1045	209	--	1.83	--	--	0.13	--	37.1	20.6	--	--	171	34.1	0.3	<0.01	<0.01
Rainbow Hot Springs																			
H7913	n.r.	7.17	--	329	--	0.19	--	--	0.07	--	26.5	15.8	<0.50	--	274	75.0	0.5	0.3	0.12
J8135	6.5	7.00	1475	301	--	0.44	--	--	0.12	--	26.8	16.0	--	--	271	46.9	0.4	0.1	0.03
H7914	n.r.	n.r.	--	240	--	11.0	--	--	0.26	--	18.0	4.90	<0.50	--	93	98.5	0.5	0.4	0.13
H7915	n.r.	n.r.	--	292	--	4.20	--	--	0.15	--	8.20	1.70	<0.05	--	91	99.4	0.6	0.5	0.12
J8133	3.0	2.32	--	307	--	4.16	--	--	0.20	--	7.05	2.11	--	--	90	63.1	0.5	0.3	0.07
J8136	3.2	2.95	1213	228	--	11.9	--	--	0.29	--	17.6	5.62	--	--	95	71.9	0.5	0.1	<0.01
J8137	3.0	2.34	--	294	--	4.21	--	--	0.20	--	7.30	2.05	--	--	97	76.3	0.5	0.2	0.02
J8134	3.0	2.30	--	298	--	3.79	--	--	0.20	--	7.22	2.09	--	--	93	53.9	0.5	0.4	0.09
Hot Springs Basin																			
J8138	3.0	1.93	4740	270	--	10.45	--	--	0.16	--	4.52	3.11	--	--	22	26.0	0.0	<0.01	<0.01
F8405	3.0	2.81	--	229	--	11.98	--	--	--	--	15.1	3.38	--	--	141	254.7	--	--	--
J8139	3.2	2.55	2760	265	--	10.02	--	--	0.16	--	12.6	3.73	--	--	146	221.0	0.0	0.7	0.02
J8140	3.0	1.79	7430	288	--	9.13	--	--	0.04	--	0.82	0.92	--	--	5	12.9	0.0	<0.01	<0.01
J8141	1.6	1.74	7180	280	--	8.76	--	--	0.02	--	0.61	0.58	--	--	6	13.0	<0.01	<0.01	<0.01
F8406	1.5	2.15	--	235	--	4.19	--	--	--	--	1.89	<0.50	--	--	2	8.4	--	--	--
J8142	1.6	1.70	7320	172	--	1.05	--	--	<0.02	--	0.32	0.27	--	--	1	6.1	<0.01	<0.01	<0.01
F8407	4.0	2.45	--	108	--	2.54	--	--	--	--	0.23	<0.50	--	--	1	2.2	--	--	--
F8401	1.6	2.08	--	240	--	8.02	--	--	--	--	2.29	0.97	--	--	6	17.8	--	--	--
F8402	2.7	3.05	--	168	--	0.77	--	--	--	--	1.95	0.62	--	--	18	17.3	--	--	--
F8403	1.8	2.31	--	279	--	3.24	--	--	--	--	2.00	0.51	--	--	10	8.5	--	--	--
F8404	1.6	2.30	--	226	--	9.37	--	--	--	--	7.85	2.66	--	--	23	29.5	--	--	--
Confluence of Broad and Shallow Creeks																			
HBS8001	6.8	7.83	--	229	--	0.06	--	--	0.06	--	25.2	13.5	0.26	--	180	30.2	0.5	0.1	0.07
HBS8002	7.1	n.r.	--	231	--	0.09	--	--	0.12	--	27.3	13.3	0.26	--	184	28.1	0.0	0.1	0.07
H83c12	6.8	8.34	--	236	--	--	--	--	--	--	54.5	13.20	--	--	182	26.8	0.5	--	--
H83c41	6.9	8.42	--	226	--	--	--	--	--	--	39.3	12.4	--	--	168	26.6	0.5	--	--
H83c57	6.9	8.29	--	218	--	--	--	--	--	--	35.6	9.01	--	--	177	27.7	0.5	--	--

Table I: Water Analyses

Sample Number	NH4 mg/L	HCO3 mg/L	CO3 mg/L	SO4 mg/L	Cl mg/L	F mg/L	Br mg/L	B mg/L	H2S mg/L	Zn mg/L	Cu mg/L	acidity meq/L	deuterium ‰	O-18 ‰	C-13 ‰	Tritium (TU)		
Astringent Creek Thermal Area																		
J8148	3.6	346	--	96	182	0.8	--	4.6	0.06	--	--	--	--	-18.1	--	--	--	
J8149	2.8	405	--	78	142	0.6	--	3.7	0.03	--	--	--	--	-18.4	--	--	--	
Rainbow Hot Springs																		
H7913	--	476	--	150	225	3.6	--	17.8	--	<0.02	<0.04	--	--	--	--	--	--	
J8135	13.9	499	--	168	213	2.6	--	17.5	--	--	--	--	--	-16.2	--	--	--	
H7914	--	0	--	480	38	1.2	--	3.4	--	0.18	<0.04	--	--	--	--	--	--	
H7915	--	0	--	640	37	1.3	--	3.9	--	0.16	<0.04	--	--	--	--	--	--	
J8133	19.6	0	--	662	38	1.4	--	5.3	0.03	--	--	6.1	--	--	--	--	--	
J8136	33.8	0	--	540	37	1.1	--	3.4	0.03	--	--	3.1	--	-15.4	--	--	--	
J8137	--	0	--	640	35	1.2	--	3.8	--	--	--	5.8	--	-15.0	--	--	--	
J8134	27.5	0	--	680	37	1.3	--	3.5	0.035	--	--	6.0	--	-15.0	--	--	--	
Hot Springs Basin																		
J8138	4.9	0	--	1220	4	0.4	--	1.6	0.45	--	--	21.3	--	-14.8	--	--	--	
F8405	--	0	--	1350	5	--	--	--	--	--	--	--	--	--	--	--	--	
J8139	59.3	0	--	1130	6	0.7	--	3.3	0.18	--	--	4.2	--	-9.7	--	--	--	
J8140	35.2	0	--	1620	3	0.3	--	3.2	0.46	--	--	30.1	--	-13.0	--	--	--	
J8141	45.2	0	--	1640	8	0.3	--	2.1	0.05	--	--	32.4	--	-13.8	--	--	--	
F8406	--	0	--	1240	4	--	--	--	--	--	--	--	--	--	--	--	--	
J8142	92.2	0	--	1640	4	0.2	--	2.5	0.74	--	--	30.1	--	-7.5	--	--	--	
F8407	--	0	--	1340	8	--	--	--	--	--	--	--	--	--	--	--	--	
F8401	--	0	--	1520	6	--	--	--	--	--	--	--	--	--	--	--	--	
F8402	--	0	--	190	4	--	--	--	--	--	--	--	--	--	--	--	--	
F8403	--	0	--	830	4	--	--	--	--	--	--	--	--	--	--	--	--	
F8404	--	0	--	1140	5	--	--	--	--	--	--	--	--	--	--	--	--	
Confluence of Broad and Shallow Creeks																		
HS8001	--	494	--	62	68	3.1	--	8.2	--	--	--	--	--	--	--	--	--	--
HS8002	--	520	--	66	68	3.1	--	8.6	--	--	--	--	--	--	--	--	--	--
H83c12	--	626	--	34	67	3.4	--	8.9	--	--	--	--	-147	-17.8	-4.0	--	--	
H83c41	--	599	--	29	68	3.5	--	8.7	--	--	--	--	-146	-17.8	-4.3	--	--	
H83c57	--	493	--	38	71	4.0	--	9.0	--	--	--	--	-143	-17.6	--	--	--	

Table I: Water Analyses

Sample Number	Date Name and/or Description	Latitude	Longitude	Discharge (L/min)	Coll.	Temp. (°C)
Crater Hills						
J7804	28-Sep-78 Crater Hills Geyser	44°39.25'	110°44.00'	n.e.	JMT	88.0
F9021	5-Sep-90 Crater Hills Geyser	44°39.25'	110°44.00'	n.o.	JMT	80.8
J7805	28-Sep-78 Unnamed spring near Crater Hills Geyser, acidic seep	--	--	8	JMT	66.0
Mud Volcano						
Cauldron Area						
J7914	4-Oct-79 Unnamed new spring near buffalo ford	--	--	200	JMT	45.0
F9022	5-Sep-90 Unnamed spring, Mud Volcano Annex	--	--	n.e.	JMT	68.0
MARY BAY HOT SPRINGS						
J7802	28-Sep-78 Butte Spring	44°31.27'	110°16.49'	8	JMT	85.0
J8426	12-Sep-84 Butte Spring	44°31.27'	110°16.49'	2	JMT	84.0
F9023	5-Sep-90 Butte Spring	44°31.27'	110°16.49'	n.e.	JMT	85.0
J7801	28-Sep-78 Unnamed spring, "Cauldera Fault," near Steamboat Point, E of Butte Spring	44°31.07'	110°16.18'	12	JMT	80.0
J7803	28-Sep-78 Unnamed spring, east northeast of Holmes Point	44°32.33'	110°17.36'	4	JMT	54.5
J8425	12-Sep-84 Unnamed spring along north shore of Yellowstone Lake, near Butte Spring	--	--	n.e.	JMT	16.0
BRIMSTONE BASIN						
J7829	5-Oct-78 Unnamed small drainage at west end	--	--	4	JMT	12.0
J7830	5-Oct-78 Unnamed 1st small drainage south of Columbine Creek Fork	--	--	4	JMT	9.5
J7831	5-Oct-78 Unnamed small drainage flowing north towards lake	--	--	50	JMT	8.5
J7832	5-Oct-78 Unnamed small drainage on southwest	--	--	4	JMT	5.5
WEST THUMB GEYSER BASIN						
Main Group						
J8628	18-Sep-86 Big Cone Spring	44°24.653'	110°34.692'	1	JMT	83.0
J8012	18-Sep-80 Ephedra Spring	44°24.602'	110°34.766'	35	JMT	90.0
J8630	18-Sep-86 Ephedra Spring	44°24.602'	110°34.766'	38	JMT	91.0
J8011	18-Sep-80 Lakeside Spring	44°24.574'	110°34.651'	250	JMT	91.0
J8010	18-Sep-80 Twin Geyser	44°24.634'	110°34.841'	45	JMT	n.r.
J8629	18-Sep-86 Twin Geyser	44°24.634'	110°34.841'	68	JMT	94.0

Table I: Water Analyses

Sample Number	f pH	l pH	Cond. mS/cm	SiO2 mg/L	Al mg/L	Fe(tot) mg/L	Fe(II) mg/L	Fe(III) mg/L	Mn mg/L	As mg/L	Ca mg/L	Mg mg/L	Sr mg/L	Ba mg/L	Na mg/L	K mg/L	Li mg/L	Rb mg/L	Cs mg/L
Crater Hills																			
J7804	4.4	3.18	--	676	--	<0.05	--	--	0.21	--	5.64	1.04	0.10	0.4	640	133.0	6.9	1.9	1.79
F9021	3.5	3.70	--	691	10.6	0.17	--	--	0.13	7.30	4.87	0.41	0.15	0.1	597	139.8	4.9	1.1	0.67
J7805	2.2	2.30	--	288	--	--	--	--	0.08	--	6.38	2.40	0.10	0.3	12	6.6	0.0	0.1	0.18
Mud Volcano - Sulfur Cauldron Area																			
J7914	5.8	7.00	--	241	--	0.54	--	--	1.07	--	43.4	19.0	0.50	--	64	28.4	0.2	0.1	0.07
F9022	n.r.	3.71	--	349	3.29	0.8	--	--	0.04	0.97	11.8	0.36	0.05	<0.1	473	46.7	2.4	0.6	0.13
MARY BAY HOT SPRINGS																			
J7802	7.0	7.75	--	180	--	0.08	--	--	<0.05	--	6.85	0.04	--	--	400	15.7	6.0	0.6	1.47
J8426	7.1	7.83	--	188	--	--	--	--	--	--	6.06	0.04	--	--	462	22.1	6.0	--	--
F9023	7.5	6.27	--	154	<0.01	0.08	--	--	<0.01	3.10	6.23	0.01	0.31	<0.1	432	24.0	4.7	0.4	0.75
J7801	6.8	7.55	--	157	--	--	--	--	--	--	19.0	1.88	--	--	261	10.6	2.2	0.2	0.24
J7803	6.5	6.91	--	165	--	0.20	--	--	0.24	--	60.0	22.5	0.80	--	122	37.8	0.1	0.2	0.25
J8425	n.r.	7.53	--	167	--	--	--	--	--	--	23.2	2.72	--	--	272	17.1	4.7	--	--
BRIMSTONE BASIN																			
J7829	2.5	1.82	--	91	--	0.20	--	--	1.20	--	102	146	0.80	0.2	22	7.8	0.0	0.1	0.11
J7830	1.6	1.33	--	101	--	0.30	--	--	0.05	--	6.40	2.39	0.10	1.4	23	19.4	0.0	0.1	0.10
J7831	1.9	1.94	--	85	--	14.0	--	--	1.70	--	92.7	99.6	0.97	0.3	37	26.0	0.1	0.1	<0.01
J7832	3.0	2.23	--	97	--	29.50	--	--	1.70	--	77.0	59.2	0.66	0.3	29	22.0	0.1	0.1	<0.01
WEST THUMB GEYSER BASIN																			
Main Group																			
J8628	7.0	8.61	--	415	--	--	--	--	--	--	0.43	0.02	<0.20	--	341	12.0	2.2	0.4	0.22
J8012	7.3	7.90	1810 (I)	267	--	0.05	--	--	<0.01	--	0.10	<0.01	0.01	<0.1	403	18.0	3.2	0.2	0.42
J8630	7.4	8.85	--	470	--	--	--	--	--	--	0.48	<0.01	<0.20	<0.1	434	17.4	3.6	0.3	0.44
J8011	8.7	8.08	1970 (I)	251	--	<0.05	--	--	<0.01	--	0.11	<0.01	0.02	<0.1	416	17.2	2.8	0.2	0.36
J8010	8.6	7.91	1990 (I)	271	--	0.05	--	--	0.01	--	0.10	<0.01	<0.01	<0.1	419	19.8	3.5	0.2	0.42
J8629	8.3	7.81	--	425	--	--	--	--	--	--	0.07	<0.01	<0.20	<0.1	447	18.2	3.8	0.3	0.42

Table I: Water Analyses

Sample Number	NH4 mg/L	HCO3 mg/L	CO3 mg/L	SO4 mg/L	Cl mg/L	F mg/L	Br mg/L	B mg/L	H2S mg/L	Zn mg/L	Cu mg/L	acidity meq/L	deuterium ‰	O-18 ‰	C-13 ‰	Tritium (TU)	
Crater Hills																	
J7804	10.0	0	--	566	890	27.5	--	20.3	0.08	<0.01	0.0062	5.1	-130	-12.5	--	--	
F9021	--	0	--	288	756	47.7	3.8	25.2	2.61	--	--	--	-120	-10.5	--	--	
J7805	2.0	0	--	259	1	0.2	--	<0.1	0.02	0.02	--	1.9	-126	-11.6	--	--	
Mud Volcano - Sulfur Cauldron Area																	
J7914	--	437	--	3	12	3.3	--	0.2	--	0.02	<0.04	--	--	-19.4	--	--	
F9022	--	0	--	437	487	18.4	2.5	11.4	--	--	--	--	--	--	--	--	
MARY BAY HOT SPRINGS																	
J7802	1.2	97	--	203	447	13.2	--	8.8	<0.01	<0.01	--	--	-141	-15.3	--	--	
J8426	0.2	101	--	136	596	13.5	--	9.3	--	--	--	--	--	-15.2	--	--	
F9023	--	81	--	100	555	16.1	2.5	9.6	<0.01	--	--	--	-136	-13.5	--	--	
J7801	1.3	321	--	100	155	3.8	--	4.2	0.05	<0.01	--	--	-147	-17.8	--	--	
J7803	1.6	517	--	131	11	7.4	--	0.2	--	<0.01	--	--	-150	-19.2	--	--	
J8425	--	103	--	132	398	7.2	--	6.5	--	--	--	--	--	-12.7	--	--	
BRIMSTONE BASIN																	
J7829	--	0	--	1330	4	4.3	--	<0.1	--	0.09	--	10.9	-142	-20.2	--	--	
J7830	4.3	0	--	1000	3	0.2	--	<0.1	3.9	0.12	--	19.7	-143	-19.3	--	--	
J7831	--	0	--	1680	8	0.3	--	<0.1	--	0.06	--	19.6	-143	-22.3	--	--	
J7832	--	0	--	1380	4	0.3	--	0.7	--	0.05	--	15.3	-143	-19.7	--	--	
WEST THUMB GEYSER BASIN																	
Main Group																	
J8628	0.9	395	--	76	263	26.3	--	4.3	--	--	--	--	--	--	--	--	
J8012	--	586	--	41	287	27.5	--	2.7	--	--	--	--	--	-11.8	--	--	
J8630	0.9	610	--	78	302	31.0	--	5.6	0.07	--	--	--	--	--	--	--	
J8011	--	599	--	40	302	28.1	--	2.8	--	--	--	--	--	-14.5	--	--	
J8010	--	651	--	31	300	26.9	--	2.8	--	--	--	--	--	-15.2	--	--	
J8629	0.9	643	--	64	296	32.0	--	5.4	0.1	--	--	--	--	--	--	--	

Table I: Water Analyses

Sample Number	Date Name and/or Description	Latitude	Longitude	Discharge (L/min)	Coll.	Temp. (°C)
North Extension						
J8008	18-Sep-80 Occasional Geyser	44°24.936'	110°34.899'	n.o.	JMT	94.0
J8009	18-Sep-80 Unnamed spring, 150m north of King Geyser	44°24.82'	110°34.83'	22	JMT	90.0
BECHLER CANYON						
Bechler Canyon at 3 Rivers Junction						
J8027	22-Sep-80 Unnamed spring, east side of river, near Ranger Station	44°17.107'	110°54.084'	120	JMT	80.0
J8028	22-Sep-80 Unnamed spring, nerve cell-like pool, 3rd thermal feature N of Ranger Station	44°17.176'	110°53.952'	60	JMT	55.0
J8029	22-Sep-80 Unnamed spring, north end of Bechler Meadow	44°17.210'	110°53.952'	10	JMT	81.0
J8030	22-Sep-80 Unnamed spring, 200m due north of Ranger Station, west side of river	--	--	10	JMT	72.0
J8031	22-Sep-80 Unnamed cold spring on east side of river in pitchstone talus slope	44°17'	110°54'	600	RAH	6.0
Ferris Fork						
J8015	21-Sep-80 Unnamed spring	--	--	50	JMT	93.0
J8016	21-Sep-80 Unnamed spring, not present in 1975	--	--	20	JMT	91.0
J8017	21-Sep-80 Unnamed spring, northeast of J8016, Fe and Mn depositing	--	--	10	JMT	75.5
J8018	21-Sep-80 Unnamed spring above "legal hot pot"	--	--	4	JMT	80.0
J8019	21-Sep-80 Unnamed spring across from large superheated spring	--	--	28	JMT	70.0
J8020	21-Sep-80 Unnamed superheated spring on south side of fork	--	--	>100	JMT	95.5
J8021	21-Sep-80 Unnamed pool, grassy margin, gassy	--	--	>100	JMT	87.0
J8022	21-Sep-80 Unnamed spring	--	--	200	JMT	77.0
Phillips Fork						
J8023	22-Sep-80 Unnamed pool, "Mat Pool," covered with algal mat, 17m x 16m	--	--	large	JMT	54.0
J8024	22-Sep-80 Unnamed spring, north end of fork, 6m x 1.5m	--	--	600	JMT	45.0
Gregg Fork						
J8025	22-Sep-80 Unnamed spring above fork, long, linear	--	--	n.e.	JMT	52.0
J8026	22-Sep-80 Unnamed spring along south fork	--	--	80	JMT	65.0
BOUNDARY CREEK THERMAL AREAS						
Southern Boundary Creek						
J7945	9-Oct-79 Unnamed spring, east side Dunanda Falls, near grinding hole	44°14.81'	111°01.44'	40	JMT	48.0
J7946	9-Oct-79 Unnamed spring, west side below Dunanda Falls	44°14.80'	111°01.53'	44	JMT	52.0

Table I: Water Analyses

Sample Number	f pH	pH	Cond. mS/cm	SiO2 mg/L	Al mg/L	Fe(tot) mg/L	Fe(II) mg/L	Fe(III) mg/L	Mn mg/L	As mg/L	Ca mg/L	Mg mg/L	Sr mg/L	Ba mg/L	Na mg/L	K mg/L	Li mg/L	Rb mg/L	Cs mg/L
North Extension																			
J8008	7.4	6.19	--	239	--	--	--	--	0.10	0.01	0.73	<0.01	0.01	<0.1	313	13.8	2.3	0.2	0.26
J8009	7.4	7.52	1215 (I)	240	--	<0.05	--	--	0.02	--	0.87	<0.01	0.01	<0.1	249	11.7	1.6	0.1	0.42
BECHLER CANYON																			
Bechler Canyon at 3 Rivers Junction																			
J8027	6.8	7.33	1380	196	--	<0.05	--	--	0.02	--	4.05	0.04	<0.01	--	298	13.8	1.3	0.1	0.14
J8028	7.5	7.73	1525	206	--	<0.05	--	--	0.03	--	5.30	0.04	<0.10	--	328	15.3	1.3	0.2	0.13
J8029	6.2	8.05	1380	193	--	<0.05	--	--	0.02	--	3.94	0.01	0.01	--	293	11.9	1.2	0.1	0.11
J8030	6.8	8.30	1650	226	--	<0.05	--	--	0.09	--	4.82	0.01	<0.01	--	312	17.8	1.2	0.1	0.10
J8031	6.0	7.17	50	28	--	<0.05	--	--	<0.01	--	3.30	0.18	--	--	2	1.4	<0.01	0.0	<0.01
Ferris Fork																			
J8015	8.0	8.10	1085	151	--	0.20	--	--	0.02	--	1.83	<0.01	0.02	--	251	9.0	0.8	0.1	0.10
J8016	7.2	7.83	960	267	--	0.05	--	--	0.04	--	5.76	<0.01	0.03	--	195	15.3	1.0	0.1	0.12
J8017	7.2	7.80	1013	176	--	<0.05	--	--	0.21	--	6.15	0.02	0.03	--	210	15.3	1.0	0.1	0.14
J8018	7.1	7.80	1090	150	--	0.10	--	--	0.26	--	2.66	<0.01	0.02	--	233	9.3	0.8	0.1	0.11
J8019	6.5	7.76	1126	155	--	0.05	--	--	0.11	--	4.79	<0.01	0.02	--	242	9.8	0.9	0.0	0.09
J8020	7.5	8.20	1194	155	--	0.05	--	--	0.08	--	4.48	<0.01	0.02	--	262	9.8	0.8	0.1	0.08
J8021	7.3	7.93	1083	152	--	0.05	--	--	0.09	--	7.15	0.01	0.02	--	234	9.2	0.8	0.1	0.08
J8022	6.5	7.81	944	143	--	0.05	--	--	0.09	--	5.29	<0.01	0.02	--	193	9.5	0.7	0.1	0.08
Phillips Fork																			
J8023	n.r.	7.68	548	129	--	<0.05	--	--	0.01	--	3.88	0.04	<0.10	--	111	7.6	0.4	0.1	0.06
J8024	5.7	7.57	327	120	--	<0.05	--	--	<0.01	--	2.88	0.07	<0.10	--	63	6.5	0.2	0.1	0.02
Gregg Fork																			
J8025	6.2	7.64	523	142	--	<0.05	--	--	<0.01	--	4.37	0.02	<0.10	--	105	10.1	0.4	0.1	0.04
J8026	6.2	7.16	522	160	--	<0.05	--	--	0.03	--	5.01	<0.01	<0.10	--	103	12.1	0.3	0.1	0.03
BOUNDARY CREEK THERMAL AREAS																			
Southern Boundary Creek																			
J7945	5.6	6.78	--	105	--	<0.05	--	--	<0.02	--	4.70	0.55	--	--	62	4.4	0.3	0.0	0.10
J7946	5.7	6.99	--	117	--	<0.05	--	--	<0.02	--	4.80	0.76	--	--	75	5.3	0.4	0.0	0.10

Table I: Water Analyses

Sample Number	NH4 mg/L	HCO3 mg/L	CO3 mg/L	SO4 mg/L	Cl mg/L	F mg/L	Br mg/L	B mg/L	H2S mg/L	Zn mg/L	Cu mg/L	acidity meq/L	deuterium ‰	O-18 ‰	C-13 ‰	Tritium (TU)
North Extension																
J8008	--	478	--	29	233	19.7	--	2.2	--	--	--	--	--	-16.2	--	--
J8009	--	421	--	21	185	14.0	--	1.7	--	--	--	--	--	-15.0	--	--
BECHLER CANYON																
Bechler Canyon at 3 Rivers Junction																
J8027	0.1	706	--	19	85	13.3	--	0.9	<0.01	--	--	--	--	-18.5	--	9.8
J8028	0.1	764	--	23	95	14.9	--	0.8	<0.01	--	--	--	--	-17.6	--	--
J8029	0.1	695	--	19	92	14.0	--	0.8	<0.01	--	--	--	--	-18.5	--	--
J8030	--	758	--	21	91	14.5	--	1.1	--	--	--	--	--	--	--	--
J8031	--	27	--	7	5	1.8	--	<0.1	--	--	--	--	--	-18.4	--	--
Ferris Fork																
J8015	0.2	577	--	14	73	13.2	--	0.5	0.024	--	--	--	--	-18.5	--	14.9
J8016	0.2	434	--	19	88	11.1	--	0.7	0.10	--	--	--	--	-18.3	--	18.6
J8017	--	480	--	20	93	6.4	--	0.6	--	--	--	--	--	18.0	--	--
J8018	0.1	536	--	18	66	7.8	--	0.5	0.029	--	--	--	--	-18.0	--	--
J8019	0.1	536	--	25	71	8.5	--	0.6	0.034	--	--	--	--	-17.6	--	14.4
J8020	0.3	587	--	17	81	8.7	--	0.9	0.046	--	--	--	--	--	--	--
J8021	--	535	--	15	71	9.6	--	0.6	--	--	--	--	--	-18.5	--	--
J8022	0.1	455	--	13	54	8.3	--	0.4	0.03	--	--	--	--	-18.5	--	--
Phillips Fork																
J8023	0.1	266	--	8	28	7.0	--	0.2	<0.01	--	--	--	--	-18.4	--	--
J8024	--	161	--	5	17	5.0	--	0.1	--	--	--	--	--	-18.5	--	--
Gregg Fork																
J8025	0.2	266	--	8	27	6.0	--	0.2	<0.01	--	--	--	--	-18.5	--	--
J8026	--	260	--	5	24	7.7	--	0.2	--	--	--	--	--	-18.7	--	--
BOUNDARY CREEK THERMAL AREAS																
Southern Boundary Creek																
J7945	--	120	--	4	36	8.2	--	0.6	--	0.02	<0.01	--	--	-17.6	-6.0	--
J7946	--	140	--	4	38	10.6	--	0.8	--	0.01	<0.02	--	--	-18.2	--	--

Table I: Water Analyses

Sample Number	Date	Name and/or Description	Latitude	Longitude	Discharge (L/min)	Coll.	Temp. (°C)
Central Boundary Creek							
J7915	6-Oct-79	Unnamed spring, hot disc, north end of area	44°16.86'	111°02.31'	4	JMT	58.5
J7916	6-Oct-79	Unnamed spring at base of talus, at water level	44°16.81'	111°02.22'	6	JMT	70.0
J7917	6-Oct-79	Unnamed spring just above small cascade	44°16.72'	111°02.15'	14	JMT	73.0
J7918	6-Oct-79	Unnamed spring on west side of 3 springs covered with algal mats	44°16.74'	111°01.96'	12	JMT	69.0
J7919	6-Oct-79	Unnamed spring, large, flowing, on top of gravelly area with silica deposits	44°16.72'	111°01.89'	80	JMT	83.0
J7920	6-Oct-79	Unnamed spring, 2nd runoff channel, east of J7919	44°16.70'	111°01.82'	10	JMT	37.0
J7921	6-Oct-79	Unnamed spring, 3rd runoff channel, east of J7920	44°16.64'	111°01.79'	25	JMT	63.0
J7922	6-Oct-79	Unnamed spring, easternmost spring in meadow group	44°16.59'	111°01.77'	40	JMT	82.0
Northern Boundary Creek							
J7937	8-Oct-79	Unnamed spring, 2nd thermal area, only discharging spring	44°18.54'	111°02.76'	379	JMT	48.0
J7938	8-Oct-79	Unnamed creek draining meadow north of 2nd thermal area	44°18.63'	111°02.75'	200	JMT	24.0
J7939	8-Oct-79	Boundary Creek, above upper thermal area	44°18.75'	111°02.64'	n.e.	JMT	19.0
J7940	8-Oct-79	Unnamed cold spring at base of Madison Plateau	44°18.78'	111°01.96'	500	JMT	14.0
J7941	8-Oct-79	Unnamed spring, northern-most thermal spring, Fe deposits	44°18.73'	111°02.70'	75	JMT	62.0
J7942	8-Oct-79	Unnamed spring at buffalo lake crossing	44°18.09'	111°02.55'	14	JMT	77.0
J7943	8-Oct-79	Unnamed large pool, east side Boundary Creek	44°18.19'	111°02.12'	n.e.	JMT	63.0
Silver Scarf Thermal Area							
H7804	9-Oct-78	Unnamed spring, "Friction Spring," north area	44°16.59'	111°00.97'	120	RAH	69.0
J7924	6-Oct-79	Unnamed spring, "Friction Spring," north area	44°16.59'	111°00.97'	100	JMT	72.0
J7923	6-Oct-79	Unnamed spring in runoff nearest talus, north area	44°16.58'	111°00.90'	10	JMT	41.0
J7925	7-Oct-79	Unnamed gaseous spring, north end, west side	44°16.53'	111°01.11'	12	JMT	87.0
J7926	7-Oct-79	Unnamed small spouter, west of J7925	44°16.48'	111°01.11'	10	JMT	91.0
H7708	9-Oct-78	Unnamed small spring draining northeast slope	44°16.46'	111°01.18'	12	RAH	90.0
J7927	7-Oct-79	Unnamed small spring draining northeast slope	44°16.46'	111°01.18'	8	JMT	85.0
J7928	7-Oct-79	Unnamed spring, north section upper slopes, 4.7cm diameter	44°16.42'	111°01.20'	3	JMT	93.0
J7929	7-Oct-79	Unnamed spring, north section, below break in slope	44°16.38'	111°01.23'	10	JMT	89.5
J7930	7-Oct-79	Unnamed spring, south section, upper slope, 1m deep	44°16.35'	111°01.33'	10	JMT	92.0
J7931	7-Oct-79	Unnamed small spring, south section, lower slope	44°16.37'	111°01.32'	12	JMT	81.0
J7932	7-Oct-79	Unnamed spring, south section, just north of many small boulders	44°16.37'	111°01.36'	8	JMT	83.5
H78	19-Oct-78	Unnamed spring south area, south portion	--	--	24	RAH	93.0

Table I: Water Analyses

Sample Number	f pH	1pH	Cond. mS/cm	SiO2 mg/L	Al mg/L	Fe(tot) mg/L	Fe(II) mg/L	Fe(III) mg/L	Mn mg/L	As mg/L	Ca mg/L	Mg mg/L	Sr mg/L	Ba mg/L	Na mg/L	K mg/L	Li mg/L	Rb mg/L	Cs mg/L
Central Boundary Creek																			
J7915	6.5	8.01	--	192	--	<0.05	--	0.08	0.30	6.27	0.30	--	--	156	8.6	1.3	0.1	0.13	
J7916	6.8	7.72	--	187	--	<0.05	--	0.04	0.34	6.40	0.34	--	--	147	8.0	1.3	0.0	0.17	
J7917	7.0	7.64	--	142	--	<0.05	--	0.08	0.40	6.10	0.40	--	--	148	7.8	1.5	0.0	0.14	
J7918	6.5	7.44	--	169	--	<0.05	--	0.11	0.44	5.70	0.44	--	--	147	6.9	1.7	0.0	0.14	
J7919	6.5	7.66	--	176	--	<0.05	--	0.10	0.27	5.80	0.27	--	--	159	6.8	1.3	0.0	0.14	
J7920	7.0	7.73	--	162	--	<0.05	--	<0.02	0.32	3.80	0.32	--	--	142	6.3	1.4	0.0	0.11	
J7921	6.5	8.08	--	161	--	<0.05	--	0.02	0.27	3.80	0.27	--	--	154	5.9	1.6	0.0	0.12	
J7922	6.5	7.47	--	183	--	<0.05	--	0.07	0.15	3.60	0.15	--	--	163	7.9	1.3	0.0	0.17	
Northern Boundary Creek																			
J7937	5.3	5.59	--	93	--	0.05	--	0.67	0.95	7.80	0.95	--	--	17	7.2	0.1	0.0	--	
J7938	5.6	7.10	--	70	--	<0.05	--	0.05	0.87	5.50	0.87	--	--	10	4.7	0.1	0.0	--	
J7939	5.4	6.40	--	54	--	<0.05	--	0.13	0.51	5.20	0.51	--	--	8	2.5	0.1	<0.01	--	
J7940	5.5	6.40	--	36	--	<0.05	--	0.09	0.58	5.70	0.58	--	--	2	1.1	0.0	<0.01	--	
J7941	4.9	6.26	--	119	--	0.81	--	1.57	0.79	8.90	0.79	--	--	25	9.2	0.2	0.0	0.03	
J7942	5.7	6.92	--	145	--	0.40	--	0.56	0.53	12.5	0.53	--	--	43	14.1	0.3	0.1	0.28	
J7943	5.9	7.16	--	127	--	<0.05	--	0.07	0.22	4.70	0.22	--	--	99	6.4	0.7	0.0	0.17	
Silver Scarf Thermal Area																			
H7804	n.r.	7.52	--	176	--	--	--	--	0.26	4.90	0.26	--	--	164	6.6	1.0	0.1	0.05	
J7924	6.3	7.56	--	181	--	<0.05	--	0.03	0.20	4.50	0.20	--	--	158	10.1	1.1	0.1	0.18	
J7923	6.2	7.47	--	98	--	<0.05	--	0.02	0.56	4.50	0.56	--	--	73	5.8	0.7	0.0	0.07	
J7925	7.0	7.84	--	225	--	<0.05	--	0.11	0.06	3.20	0.06	--	--	182	11.0	1.3	0.1	0.15	
J7926	n.r.	8.28	--	208	--	<0.05	--	0.26	0.09	3.60	0.09	--	--	182	11.2	1.3	0.1	0.17	
H7708	n.r.	7.77	--	210	--	--	--	--	0.20	4.00	0.20	--	--	179	7.0	1.4	0.1	0.05	
J7927	6.8	7.86	--	202	--	<0.05	--	0.31	0.13	3.20	0.13	--	--	168	10.9	1.5	0.1	0.15	
J7928	6.8	7.75	--	217	--	<0.05	--	0.12	0.09	3.95	0.09	--	--	180	11.6	1.2	0.1	0.21	
J7929	6.9	7.78	--	209	--	<0.05	--	0.15	0.10	4.10	0.10	--	--	175	11.4	1.2	0.1	0.07	
J7930	6.9	7.94	--	210	--	<0.05	--	0.15	0.10	4.10	0.10	--	--	181	11.2	1.2	0.1	0.21	
J7931	6.8	7.74	--	198	--	<0.05	--	0.13	0.11	3.70	0.11	--	--	174	11.2	1.3	0.1	0.15	
J7932	6.7	7.60	--	198	--	<0.05	--	0.09	0.08	3.40	0.08	--	--	174	10.8	1.4	0.1	0.14	
H78	n.r.	8.60	--	211	--	--	--	--	0.13	3.46	0.13	--	--	176	6.8	0.4	0.1	0.02	

Table I: Water Analyses

Sample Number	NH4 mg/L	HCO3 mg/L	CO3 mg/L	SO4 mg/L	Cl mg/L	F mg/L	Br mg/L	B mg/L	H2S mg/L	Zn mg/L	Cu mg/L	acidity meq/L	deuterium ‰	O-18 ‰	C-13 ‰	Tritium (TU)		
Central Boundary Creek																		
J7915	0.6	267	--	14	83	14.6	--	1.5	--	0.02	<0.01	--	--	--	--	--	--	
J7916	--	249	--	16	80	13.8	--	1.4	--	0.02	<0.01	--	-139	-17.2	--	--	--	
J7917	0.4	252	--	15	79	15.2	--	1.4	--	0.01	<0.01	--	-139	-17.3	--	75	--	
J7918	--	261	--	16	74	15.4	--	1.4	--	0.03	<0.01	--	--	--	--	--	--	
J7919	--	254	--	16	79	16.0	--	1.4	0.02	0.02	<0.01	--	-138	-17.3	--	--	--	
J7920	--	224	--	14	85	16.0	--	1.4	--	<0.01	<0.01	--	-138	-17.0	--	--	--	
J7921	0.2	227	--	14	81	18.0	--	1.4	--	0.03	<0.01	--	-140	-17.2	--	--	--	
J7922	0.3	246	--	13	89	19.2	--	1.5	0.05	<0.01	<0.01	--	-139	-17.2	--	73.3	--	
Northern Boundary Creek																		
J7937	--	75	--	8	5	5.7	--	<0.1	0.19	<0.01	<0.01	--	-136	-18.1	--	--	--	
J7938	--	50	--	6	7	5.4	--	0.1	--	<0.01	<0.01	--	--	-17.4	--	--	--	
J7939	--	43	--	3	5	4.1	--	<0.1	--	<0.01	<0.01	--	--	-17.6	--	--	--	
J7940	--	22	--	2	5	3.1	--	<0.1	--	<0.01	<0.01	--	--	-18.6	--	--	--	
J7941	0.4	98	--	7	7	7.3	--	<0.1	0.025	<0.01	<0.01	--	-135	-18.0	--	--	--	
J7942	0.6	123	--	27	18	8.5	--	0.3	0.035	0.01	<0.01	--	-136	-18.0	-4.2	107	--	
J7943	0.6	144	--	5	79	14.3	--	1.4	0.04	0.01	<0.01	--	-138	-17.4	--	--	--	
Silver Scarf Thermal Area																		
H7804	--	244	--	11	95	16.3	--	2.0	--	--	--	--	--	--	--	--	--	--
J7924	--	232	--	8	98	16.8	--	1.6	--	0.01	--	--	-139	-17.2	--	--	--	
J7923	0.2	141	--	4	48	10.6	--	1.3	--	0.01	<0.01	--	--	-17.9	--	--	--	
J7925	--	266	--	10	116	19.5	--	1.7	--	<0.01	<0.01	--	-138	-17.1	-8.2	81.3	--	
J7926	0.5	254	--	10	119	19.5	--	1.7	0.02	<0.01	--	--	-138	-16.9	--	--	--	
H7708	--	300	--	9	99	22.0	--	2.5	--	--	--	--	--	--	--	--	--	--
J7927	--	228	--	7	95	22.0	--	1.6	--	<0.01	<0.01	--	-139	-17.2	--	--	--	
J7928	0.4	271	--	11	109	19.8	--	1.9	0.02	<0.01	<0.01	--	-137	-17.2	-8.3	--	--	
J7929	--	287	--	9	111	19.2	--	1.9	--	0.01	--	--	-137	-17.1	--	--	--	
J7930	0.6	259	--	10	107	19.1	--	1.9	0.025	0.01	--	--	-137	-17.9	--	71.9	--	
J7931	--	266	--	9	106	19.0	--	1.9	--	<0.01	--	--	-131	-14.8	--	--	--	
J7932	0.6	299	--	11	106	19.9	--	1.6	--	<0.01	--	--	-140	-17.2	--	--	--	
H78	--	259	--	13	110	19.6	--	1.6	--	--	--	--	--	--	--	--	--	

Table I: Water Analyses

Sample Number	Date Name and/or Description	Latitude	Longitude	Discharge (L/min)	Coll.	Temp. (°C)
J7934	7-Oct-79 Unnamed spring, south area, south portion, below marsh to south	44°16.15'	111°01.58'	12	JMT	91.0
J7935	7-Oct-79 Unnamed spring, south area, north portion, triangular shaped	44°16.20'	111°01.48'	12	JMT	89.0
J7936	7-Oct-79 Unnamed spring, south area, top, small, oval shape, 25cm	44°16.21'	111°01.50'	4	JMT	83.0
J7944	9-Oct-79 Unnamed spring, brink of Silver Scarf Falls	44°14.84'	111°01.20'	huge	JMT	22.5
J7933	7-Oct-79 Unnamed cold spring between main and south section	44°16.08'	111°01.23'	8	JMT	14.0
MOUNTAIN ASH CREEK THERMAL AREA						
J8032	23-Sep-80 Unnamed spring, upper end of thermal area, above cascade	--	--	900	JMT	50.0
J8033	25-Sep-80 Unnamed spring, main area	--	--	n.e.	JMT	n.r.
HSP47	13-Oct-80 Unnamed spring, fork to Mountain Ash Creek	--	--	n.e.	RAH	57.5
HSP24	13-Oct-80 Unnamed spring, drains to Moutain Ash Creek	--	--	273	RAH	39.0
SMOKE JUMPER HOT SPRINGS						
SMO47	17-Sep-80 Unnamed spring, Hutchinson's spring #47	--	--	<19	RAH	86.7
SMO67	18-Sep-80 Unnamed spring, Hutchinson's spring #67	--	--	5	RAH	79.5
HUCKLEBERRY HOT SPRINGS						
J8635	19-Sep-86 Huckleberry Hot Spring, 150m from old bathhouse	44°06.87'	110°41.22'	8	JMT	57.0
J8636	19-Sep-86 Huckleberry Hot Spring	44°06.87'	110°41.36'	4	JMT	49.0
JACKSON LAKE HOT SPRINGS (sampled when lake was drained for seismic reinforcement, now submerged)						
J8631	19-Sep-86 Unnamed spring, northern end	44°0.29'	110°42.63'	38	JMT	62.0
J8632	19-Sep-86 Unnamed spring, 150m from large rock, 75m south of J8631	44°0.29'	110°42.63'	38	JMT	68.0
J8633	19-Sep-86 Unnamed spring near hydrothermally altered limestone	44°0.29'	110°42.63'	38	JMT	61.0
J8634	19-Sep-86 Unnamed spring, southwestern-most spring	44°0.29'	110°42.63'	11	JMT	55.0

Table I: Water Analyses

Sample Number	f pH	I pH	Cond. mS/cm	SiO2 mg/L	Al mg/L	Fe(tot) mg/L	Fe(II) mg/L	Fe(III) mg/L	Mn mg/L	As mg/L	Ca mg/L	Mg mg/L	Sr mg/L	Ba mg/L	Na mg/L	K mg/L	Li mg/L	Rb mg/L	Cs mg/L
J7934	6.8	7.93	--	208	--	<0.05	--	--	0.08	--	3.70	0.13	--	--	171	9.5	1.3	0.0	0.15
J7935	6.8	7.72	--	334	--	<0.05	--	--	0.11	--	4.00	0.12	--	--	173	9.8	1.3	0.0	0.26
J7936	6.8	7.48	--	212	--	<0.05	--	--	0.11	--	4.10	0.11	--	--	174	10.6	1.3	0.0	0.15
J7944	7.4	8.18	--	174	--	0.04	--	--	0.05	--	4.50	0.30	--	--	141	8.3	1.2	0.0	--
J7933	5.4	6.40	--	42	--	<0.05	--	--	0.05	--	2.70	0.39	--	--	9	--	2.0	0.1	<0.01
MOUNTAIN ASH CREEK THERMAL AREA																			
J8032	5.8	8.06	618	120	--	<0.05	--	<0.01	--	--	5.09	0.11	<0.10	--	122	7.5	0.4	0.1	0.04
J8033	n.r.	7.82	456	117	--	<0.05	--	<0.01	--	--	4.68	0.14	<0.10	--	92	6.9	0.3	0.1	<0.01
HSP47	6.0	n.r.	--	111	--	<0.04	--	0.03	--	--	5.20	0.29	--	--	169	4.5	6.2	0.1	0.10
HSP24	5.9	n.r.	--	111	--	0.07	--	0.02	--	--	3.94	0.13	--	--	84	3.7	0.0	0.2	0.20
SMOKE JUMPER HOT SPRINGS																			
SMO47	5.5	6.90	--	2	--	0.04	--	0.05	--	--	0.66	0.04	--	--	36	7.2	0.0	0.1	0.80
SMO67	4.7	3.70	--	178	--	0.04	--	0.06	--	--	0.27	0.29	--	--	12	5.3	--	0.2	0.10
HUCKLEBERRY HOT SPRINGS																			
J8635	6.8	8.35	--	--	--	0.03	--	0.14	--	--	8.72	0.65	0.10	--	212	7.3	0.7	0.1	0.05
J8636	6.2	8.35	--	--	--	0.04	--	0.16	--	--	8.47	0.73	0.03	--	208	7.1	0.7	0.1	0.07
JACKSON LAKE HOT SPRINGS (sampled when lake was drained for seismic reinforcement, now submerged)																			
J8631	6.8	7.25	--	217	--	0.27	--	0.06	--	--	212	37.1	1.80	--	67	25.4	0.3	0.1	0.03
J8632	n.r.	7.39	--	115	--	0.21	--	0.05	--	--	225	37.9	1.95	--	71	26.1	0.4	0.1	0.04
J8633	6.5	7.55	--	176	--	0.42	--	0.07	--	--	216	36.8	1.78	--	71..8	24.4	0.3	0.1	0.04
J8634	6.2	7.28	--	202	--	0.28	--	0.07	--	--	205	34.1	1.60	--	71	23.6	0.3	0.1	0.03

Table I: Water Analyses

Sample Number	NH4 mg/L	HCO3 mg/L	CO3 mg/L	SO4 mg/L	Cl mg/L	F mg/L	Br mg/L	B mg/L	H2S mg/L	Zn mg/L	Cu mg/L	acidity meq/L	deuterium ‰	O-18 ‰	C-13 ‰	Tritium (TU)
J7934	0.4	247	--	12	97	20.5	--	1.5	0.04	<0.01	--	--	-138	-17.5	-6.3	80.4
J7935	--	224	--	10	98	20.3	--	1.6	--	<0.01	--	--	-138	-17.2	--	--
J7936	0.4	208	--	13	97	19.0	--	1.6	--	<0.01	--	--	-136	-17.2	--	--
J7944	--	212	--	9	82	17.7	--	1.5	--	0.01	--	--	--	--	--	--
J7933	0.0	30	--	1	12	3.3	--	<0.1	--	<0.01	--	--	--	-18.4	--	--
MOUNTAIN ASH CREEK THERMAL AREA																
J8032	--	262	--	9	53	8.3	--	0.4	--	--	--	--	--	--	--	--
J8033	--	198	--	6	33	8.5	--	0.2	--	--	--	--	--	-18.3	--	--
HSP47	--	381	--	11	52	7.2	--	<0.1	--	--	--	--	--	--	--	--
HSP24	0.0	184	--	6	38	7.2	--	<0.1	--	--	--	--	--	--	--	--
SMOKE JUMPER HOT SPRINGS																
SMO47	--	26	--	66	11	2.9	--	<0.1	--	--	--	--	--	--	--	--
SMO67	--	0	0	44	11	0.9	--	<0.1	--	--	--	0.5	--	--	--	--
HUCKLEBERRY HOT SPRINGS																
J8635	--	357	--	4	94	11.0	--	1.3	--	--	--	--	-142	-18.4	--	--
J8636	--	357	--	4	94	11.0	--	1.3	--	--	--	--	-142	-18.5	--	--
JACKSON LAKE HOT SPRINGS (sampled when lake was drained for seismic reinforcement, now submerged)																
J8631	--	122	--	680	39	3.5	--	0.1	--	--	--	--	-144	-19.2	--	--
J8632	--	146	--	640	41	3.8	--	0.1	--	--	--	--	-144	-19.3	--	--
J8633	--	131	--	720	39	3.2	--	<0.1	--	--	--	--	-144	-19.3	-4.9	--
J8634	--	119	--	670	36	2.7	--	0.1	--	--	--	--	-141	-19.2	--	--