UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

WASHINGTON STATE

basic data for thermal springs and wells as recorded in GEOTHERM

By

James D. Bliss

U. S. Geological Survey

Open-File Report 83-438

Menlo Park, California

July 1983

INTRODUCTION

GEOTHERM, a computerized information system now off-line, was used to maintain data on the geology, geochemistry and hydrology of geothermal sites primarily within the United States. The system was proposed at the First Geothermal Implementation Conference in New Zealand in 1974 (Swanson, 1977) and was active until 1983. The primary mission was to provide a broad informational framework for the Geothermal Research Program (Duffield and Guffanti, 1981). GEOTHERM was used to support national geothermal assessments--in 1978 (Muffler, 1979) and 1982 (Reed, 1983). It was however a public system and provided data to both public and private sectors. A detailed discussion on databases in GEOTHERM and a general scheme of how the information system operated can be found in Bliss and Rapport (1983).

This report on Washington is one of a series intended to preserve the data collected for GEOTHERM and make the data available to the public. States with significant geochemical data for geothermal fluids will be covered in individual reports such as this. A report will also be issued to cover miscellaneous data collected for sites in the central and eastern United States. The data presented in this series is also available as a data file on the internationally-available General Electric Mark III service, a timeshare network. Those interested in accessing that system should contact the Energy Resource Center, University of Oklahoma, Norman, Oklahoma 73070. It is anticipated that a portion of the data will also be available on magnetic tape from the National Technical Information Service, U. S. Department of Commerce, Springfield, VA 22161. It will not be available until after the completion of the open-file series.

GEOTHERM INDEXES

Three computer-generated indexes are found in appendices A, B, and C of this report. The indexes give one line summaries of each GEOTHERM record describing the chemistry of geothermal springs and wells in the sample file for Washington. Each index is sorted by different variables to assist the user in locating geothermal records describing specific sites.

Appendix A (p. 38-40) is sorted by county name and the name of the source. Also given are latitude, longitude (both in decimal minutes), township, range, section, GEOTHERM record identifier, and temperature (^{o}C). In conducting a search of Appendix A, site names are quite useful for locating springs or wells for which a specific name is commonly used, but sites which do not have specific names are more difficult to locate. It is suggested that site titles which begin with words such as warm, hot, unnamed, pumped, well, or spring be checked. Descriptive text found as part of the site name and the site coordinates should be used to assist in determining location.

Appendix B (p. 40-41) is sorted by county, township, range, and section. Also given are name of source, GEOTHERM record identifier, and temperature (°C). Records missing items used for sorting will be listed first.

Appendix C (p. 42-44) is first sorted into one-degree blocks by latitude, and longitude, and then by name of source. Adjacent one-degree blocks which are published as a 1:250,000 map are combined under the appropriate map name. Also given are GEOTHERM record identifier, and temperature (°C). Records missing items used for sorting will be listed first. Numbers with a blank in the same position as zero will be given first.

GEOTHERM SAMPLE FILE

GEOTHERM sample file contains 78 records for Washington (Table 1). Records may be present which are duplicates for the same analyses. A record may contain data on location, sample description, analysis type (water, condensate, or gas), collection condition, flow rates, and the chemical and physical properties of the fluid. Stable and radioactive isotopic data are occasionally available. Some records may contain only location and temperature. When sufficient chemical data was available, the charge balance (percentage of difference in anion- and cation-milliequivalents) was computed and added to the record. Many of the numeric fields in the sample file can be directly qualified. The qualifier code precedes the number when appropriate. The codes and their meaning are given in Table 1.

Each thermal spring or well is usually represented by several records. This may document temporal changes in the geothermal fluids. Judgement on what constituted acceptable data was extremely complicated and the primary attempt was to insure that each GEOTHERM record faithfully reproduced the published data. On occasion, glaring inconsistencies or data clearly of poor quality were excluded. Regrettably, no database can be constructed or supported without the introduction of errors. The user, therefore, is advised to check with the published literature whenever possible. Users should carefully and critically evaluate the records they use.

This compilation should contain all of the chemical data for geothermal fluids in Washington available as of December, 1981. However, no claim is made for completeness, and published sources have probably been missed. About 68% of the records in this list contains information which was unpublished at the time of data entry. A critically evaluated and corrected list of over 2000 records for the United States was extracted from the sample file and issued as a reference document for the national low temperature geothermal resource assessment (Reed and others, 1983). This, along with a list of geothermal springs by Berry, and other (1980) may be helpful to some users.

GEOTHERM BIBLIOGRAPHY

A bibliography is given in Appendix D (p. 45). The abbreviated form of the reference (called code) is identifed as the record source in the full record list and is used to sort the entries in this appendix. Codes with a leading "*" identify records based on information which was unpublished at the time the record was prepared.

ACKNOWLEDGEMENTS

Contributions and support to GEOTHERM have been made by many in both federal and state agencies. This includes the U.S. Department of Energy (and associated contractors), and U.S. National Oceanic and Atmospheric Administration. Data-entry forms for most sites in Washington were prepared by the staff of the U.S. Geological Survey.

REFERENCES CITED

Berry, G. W., Grim, P. J., and Ikelman, J. A., 1980, Thermal springs list for the United States: National Oceanic and Amospheric Administration, Key to Geophysical Records Document No. 12, 59 p.

Bliss, J. D., and Rapport, Amy, 1983, GEOTHERM: the U.S. Geological Survey geothermal information system: Computers & Geosciences, v. 9, no. 1, p. 35-39.

Duffield, W. A., and Guffanti, Marianne, 1981, The geothermal research program of the U.S. Geological Survey: U.S. Geological Survey Open-File Report 81-564, 108 p.

Muffler, L. J. P., ed., 1979, Assessment of geothermal resources of the United States--1978: U.S. Geological Survey Circular 790, 163 p.

Reed, M. J., ed., 1983, Assessment of low-temperature geothermal resources of the United States--1982: U.S. Geological Survey Circular 892.

Reed, M. J., Mariner, R. H., Brook, C. A., and Sorey, M. L., 1983, Selected data for low-temperature (less than 90°C) geothermal systems in the United States; reference data for U.S. Geological Survey Circular 892: U.S. Geological Survey Open-File Report 83-250, 129 p.

Swanson, J. R., 1977, GEOTHERM data file: Geothermal Resources Council Transactions, v. 1, p. 285.

TABLE 1

State of Washington: computer-generated listing of records describing geothermal-fluid samples. [A few records may be for cold springs or wells--this was to provide ground-water references for some studies.]

ORGANIZATION: Records are sorted by county and then by the name of the spring or well. Order is the same in Appendix A.

UTM: The UTM Easting label was omitted. The UTM Easting figure will be given directly below the the Northing label.

QUALIFICATION CODES: All numeric attributes may be qualified. The codes and their meaning:

L = less than

G = greater than

E = estimated

T = trace (no numeric value reported)

N = not detected (not followed by number)

Q = qualified (other data in qualification field)

R = midpoint of range (actual range in qualification field)

REFERENCE: An expanded citation of the reference is found in Appendix D. The abbreviated form used in this table is called "CODE" in the appendix. Unpublished sources are preceded with "*".

RECORD 00001

GEOTHERM SAMPLE FILE — GEOTHERM FILE ID: 0001303

NAME OF SAMPLE SOURCE... OLYMPIC HOT SPRING
WARING NUMBER..... 63.

LOCATION — TOWNSHIP-RANGE — COORDINATES

COUNTRY.....	UNITED STATES	29N 008E 28 NW	
STATE.....	WASHINGTON	B&M: W	UTM ZONE... +10
COUNTY.....	CLALLAM		NORTHING... 5312930.
GEOLOGIC PROVINCE..			435180.
MAP REFERENCE.....	MT CARRIE 1:24000		

SAMPLE DESCRIPTION AND CONDITIONS

DATE/COLLECTOR..... KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
TEMPERATURE (C)..... 48.
DISCHARGE..... E 500. L/MIN

REFERENCE AND IDENTIFICATION

COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, M.A., WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES, FOR D.O.E.

RECORD 00002

GEOTHERM SAMPLE FILE — GEOTHERM FILE ID: 0000765

NAME OF SAMPLE SOURCE... OLYMPIC HOT SPRINGS

LOCATION — TOWNSHIP-RANGE — COORDINATES

COUNTRY.....	UNITED STATES		LAT/LONG... 47-58.90 N 123-41.20 W
STATE.....	WASHINGTON		UTM ZONE... +10
COUNTY.....	CLALLAM		NORTHING... 5314272.
GEOLOGIC PROVINCE..			448758.

SAMPLE DESCRIPTION AND CONDITIONS

TEMPERATURE (C)..... 47.0

WATER ANALYSIS

PH..... 7.5

ANALYSIS — ISOTOPES (D/OOO)

B.....		F.....		NA...	78.	S102. 80.
CA....	1.4					
CL....	0.74					
CO....		K.....	1.3			

REFERENCE AND IDENTIFICATION

COMPILED BY..... RENNER, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... WHITE AND WILLIAMS, 1975; CAMPBELL AND OTHERS, 1970

RECORD 00003

GEOTHERM SAMPLE FILE — GEOTHERM FILE ID: 0000041

NAME OF SAMPLE SOURCE... OLYMPIC HOT SPRINGS

LOCATION — TOWNSHIP-RANGE — COORDINATES

COUNTRY.....	UNITED STATES		LAT/LONG... 47-58.6 N 123-40.9 W
STATE.....	WASHINGTON	B&M: WILLAMETTE	
COUNTY.....	CLALLAM		
GEOLOGIC PROVINCE..	38		
MAP REFERENCE.....	MOUNT CARRIE 7.5'		

SAMPLE DESCRIPTION AND CONDITIONS

DATE/COLLECTOR..... 1977/07/20

TEMPERATURE (C)..... 48.5
DISCHARGE..... L/MIN
OTHER SAMPLE INFORMATION.. SULFIDE AS H2S = 14 MG/L
WATER ANALYSIS
PH..... 9.50
SPECIFIC CONDUCTANCE..... 340.
CHARGE IMBALANCE (% DIFF)... 4.3
ANALYSIS IN MG/L
ISOTOPES (O/OO)

AL....		CR.....		MG...	L 0.05		
B.....	0.82	F.....	1.2	NA...	72.	SIO2.	66.
BE....		FE(TOT).		NB...		SO4..	5.
CA....	0.9	HCO3....	175.				
CL....	11.						
CO....		K.....	1.1				

REFERENCE AND IDENTIFICATION
COMPILED BY..... MARINER, R. H.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... MARINER AND OTHERS, 1982

RECORD 00004

GEOTHERM SAMPLE FILE
GEOTHERM FILE ID: 0000763
NAME OF SAMPLE SOURCE... SOL DUC HOT SPRING
LOCATION
TOWNSHIP-RANGE
COORDINATES
COUNTRY..... UNITED STATES
STATE..... WASHINGTON
COUNTY..... CLALLAM
GEOLOGIC PROVINCE..
LAT/LONG... 47-58.10 N 123-52.10 W
UTM ZONE... +10
NORTHING... 5312927.
435185.
SAMPLE DESCRIPTION AND CONDITIONS
TEMPERATURE (C)..... 50.0
WATER ANALYSIS
PH..... 7.5
ANALYSIS
ISOTOPES (O/OO)

B.....		F.....		NA...	84.	SIO2.	120.
CA....	1.6						
CL....	1.7						
CO....		K.....	1.6				

REFERENCE AND IDENTIFICATION
COMPILED BY..... RENNER, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... WHITE AND WILLIAMS, 1975; CAMPBELL AND OTHERS, 1978

RECORD 00005

GEOTHERM SAMPLE FILE
GEOTHERM FILE ID: 0001304
NAME OF SAMPLE SOURCE... SOL DUC HOT SPRINGS
MARING NUMBER..... 02.
LOCATION
TOWNSHIP-RANGE
COORDINATES
COUNTRY..... UNITED STATES 29N 009E 32 NW
STATE..... WASHINGTON BGMT W
COUNTY..... CLALLAM
GEOLOGIC PROVINCE..
MAP REFERENCE..... BOGACHIEL PEAK 1:24000
OTHER LOCALITY INFORMATION: SOUTHERN MOST CISTERN
UTM ZONE... +10
NORTHING... 5312900.
435700.
SAMPLE DESCRIPTION AND CONDITIONS
DATE/COLLECTOR..... 1979/04/00 KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES

SAMPLE NUMBER..... SOC-1
POINT OF COLLECTION.. CISTERN NO. 1
TEMPERATURE (C)..... 40.0
DISCHARGE..... 170. L/MIN
OTHER SAMPLE INFORMATION.. CISTERN NO. 1 IS FED BY FOUR SOURCES: 20 GPM AT 48.0 C, 20 GPM - AT 41.0 C, 5 GPM AT 31.5 C, AND 2 GPM FROM CISTERN NO. 2.

WATER_ANALYSIS
PH..... 9.2 AT(C) 40.
SPECIFIC CONDUCTANCE..... 345.
ANALYSIS IN MG/L ISOTOPES (0/00)

AG....		CO3.....		LI...	0.1		
AL....		CR.....		MG...	0.1		
B.....		F.....		NA...		SIO2.	64.
BR....	0.2						
CA....	1.						
CL....	19.	I.....	0.01				
CO....		K.....	1.				

REFERENCE_AND_IDENTIFICATION
COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, M.A., WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES, FOR D.O.E.

RECORD 00006

GEOTHERM_SAMPLE_FILE GEOTHERM FILE ID: 0000040
NAME OF SAMPLE SOURCE... SOL DUC HOT SPRINGS
LOCATION TOWNSHIP-RANGE COORDINATES
COUNTRY..... UNITED STATES 29N 009W 32 NW LAT/LONG... 47-58.1 N 123-51.8 W
STATE..... WASHINGTON B&M: WILLAMETTE
COUNTY..... CLALLAM
GEOLOGIC PROVINCE.. 38
MAP REFERENCE..... BOGACHIEL PEAK 7.5
SAMPLE_DESCRIPTION_AND_CONDITIONS
DATE/COLLECTOR..... 1977/07/20
TEMPERATURE (C)..... 51.
DISCHARGE..... L/MIN
OTHER SAMPLE INFORMATION.. SULFIDE AS H2S = 10 MG/L
WATER_ANALYSIS
PH..... 9.46
SPECIFIC CONDUCTANCE..... 370.
CHARGE IMBALANCE (% DIFF)... 6.8
ANALYSIS IN MG/L ISOTOPES (0/00)

AL....		CR.....		MG...	L 0.05		
B.....	1.4	F.....	1.7	NA...	80.	SIO2.	60.
BE....		FE(TOT).		NB...		SO4..	7.
CA....	0.8	HCO3....	181.				
CL....	21.						
CO....		K.....	1.0				

REFERENCE_AND_IDENTIFICATION
COMPILED BY..... MARINER, R. H.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... MARINER AND OTHERS, 1982

RECORD 00007

GEOTHERM_SAMPLE_FILE GEOTHERM FILE ID: 0001305

NAME OF SAMPLE SOURCE... SOL DUC HOT SPRINGS
WARING NUMBER..... 02.

LOCATION — TOWNSHIP-RANGE — COORDINATES

COUNTRY..... UNITED STATES — 29N 009W 32 NW
STATE..... WASHINGTON — B&M: W — UTM ZONE... +10
COUNTY..... CLALLAM — NORTHING... 5312900.
GEOLOGIC PROVINCE.. — 435700.
MAP REFERENCE..... BOGACHIEL PEAK 1:24000
OTHER LOCALITY INFORMATION: THE MIDDLE CISTERN

SAMPLE DESCRIPTION AND CONDITIONS

DATE/COLLECTOR..... 1979/04/00 KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
SAMPLE NUMBER..... SDA-1
POINT OF COLLECTION.. CISTERN NO. 2
TEMPERATURE (C)..... 34.
DISCHARGE..... 113. L/MIN
OTHER SAMPLE INFORMATION.. CISTERN NO. 2 IS FED BY TWO SOURCES: EACH SOURCE CONTRIBUTES 15. GPM AT 48. C

WATER ANALYSIS

PH..... 9.2
SPECIFIC CONDUCTANCE..... 355.
ANALYSIS IN MG/L — ISOTOPES (0/00)

AG....		CO3.....		LI...	0.1
AL....		CR.....		MG...	0.1
B.....		F.....		NA...	
BR....	0.2				
CA....	3.0				
CL....	20.	I.....	0.01		
CO....		K.....	1.0		

SIO2. 64.

REFERENCE AND IDENTIFICATION

COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, M.A., WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES, FOR D.O.E.

RECORD 00008

GEOTHERM SAMPLE FILE — GEOTHERM FILE ID: 0001307

NAME OF SAMPLE SOURCE... SOL DUC HOT SPRINGS
WARING NUMBER..... 02.

LOCATION — TOWNSHIP-RANGE — COORDINATES

COUNTRY..... UNITED STATES — 29N 009W 32 NW
STATE..... WASHINGTON — B&M: W — UTM ZONE... +10
COUNTY..... CLALLAM — NORTHING... 5312900.
GEOLOGIC PROVINCE.. — 435700.
MAP REFERENCE..... BOGACHIEL PEAK 1:24000
OTHER LOCALITY INFORMATION: CISTERN IS UNDER BASEMENT FLOOR IN LODGE

SAMPLE DESCRIPTION AND CONDITIONS

DATE/COLLECTOR..... 1979/04/00 KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
SAMPLE NUMBER..... SOD-1
POINT OF COLLECTION.. CISTERN NO. 4
TEMPERATURE (C)..... 46.
DISCHARGE..... 76. L/MIN
OTHER SAMPLE INFORMATION.. SOURCE FLUID MAY BE COMPOSED OF BOTH SEEPAGE FROM BELOW AND ALSO FROM OTHER CISTERNS.

WATER ANALYSIS

PH..... 9.2
SPECIFIC CONDUCTANCE..... 355.
ANALYSIS IN MG/L — ISOTOPES (0/00)

AG....		CO3.....		LI...	0.1

AL.... CR..... MG... 0.1
B..... F..... NA... SIO2. 58.
BR.... 0.2
CA.... 2.0
CL.... 18. I..... 0.01
CO.... K..... 1.0

REFERENCE AND IDENTIFICATION
COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, M.A., WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES, FOR D.O.E.

RECORD 00009

GEOTHERM SAMPLE FILE GEOTHERM FILE ID: 0001306
NAME OF SAMPLE SOURCE... SOL DUC HOT SPRINGS
WARING NUMBER..... 02.

LOCATION TOWNSHIP-RANGE COORDINATES
COUNTRY..... UNITED STATES 29N 009W 32 NW
STATE..... WASHINGTON B&M: W UTM ZONE... +10
COUNTY..... CLALLAM NORTHING... 5312900.
GEOLOGIC PROVINCE.. 435700.
MAP REFERENCE..... BOGACHIEL PEAK 1:24000
OTHER LOCALITY INFORMATION: NORTHERN MOST CISTERN

SAMPLE DESCRIPTION AND CONDITIONS
DATE/COLLECTOR..... 1979/04/00 KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
SAMPLE NUMBER..... SOR-1
POINT OF COLLECTION.. CISTERN NO. 3
TEMPERATURE (C)..... 50.
DISCHARGE..... 151. L/MIN

WATER ANALYSIS
PH..... 9.2
SPECIFIC CONDUCTANCE..... 342.
ANALYSIS IN MG/L ISOTOPES (0/00)
AG.... CO3..... LI... 0.1
AL.... CR..... MG... 0.1
B..... F..... NA... SIO2. 65.
BR.... 0.2
CA.... 1.0
CL.... 18. I..... 0.01
CO.... K..... 1.0

REFERENCE AND IDENTIFICATION
COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, M.A., WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES, FOR D.O.E.

RECORD 00010

GEOTHERM SAMPLE FILE GEOTHERM FILE ID: 0001308
NAME OF SAMPLE SOURCE... GREEN RIVER SODA SPRINGS

LOCATION TOWNSHIP-RANGE COORDINATES
COUNTRY..... UNITED STATES 10N 004E 02 NE
STATE..... WASHINGTON B&M: W UTM ZONE... +10
COUNTY..... COWLITZ NORTHING... 5136200.
GEOLOGIC PROVINCE.. 556550.
MAP REFERENCE..... ELK ROCK 1:62500

SAMPLE DESCRIPTION AND CONDITIONS

DATE/COLLECTOR..... KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
TEMPERATURE (C)..... R 27.5
QUALIFICATION FIELD..... RANGE 25. C TO 30. C
REFERENCE AND IDENTIFICATION
COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, M.A., WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES, FOR D.O.E.

RECORD 00011

GEOTHERM SAMPLE FILE GEOTHERM FILE ID: 0001309
NAME OF SAMPLE SOURCE... NEWSKAH MINERAL SPRINGS
LOCATION TOWNSHIP-RANGE COORDINATES
COUNTRY..... UNITED STATES 16N 009W 09 LAT/LONG... 46-50. N 123-48. W
STATE..... WASHINGTON B&M: W
COUNTY..... GRAYS HARBOR
MAP REFERENCE..... ABERDEEN 1:24000
SAMPLE DESCRIPTION AND CONDITIONS
DATE/COLLECTOR..... KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
SAMPLE NUMBER..... NSA-1
TEMPERATURE (C)..... 17.5
DISCHARGE..... E 400. L/MIN
WATER ANALYSIS
SPECIFIC CONDUCTANCE..... 380.
ANALYSIS IN MG/L ISOTOPES (0/00)
AG.... CO3..... LI... 0.01
AL.... CR..... MG... 0.6
B..... F..... NA... 76. SIO2. 51.
CA.... 4.
REFERENCE AND IDENTIFICATION
COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, M.A., WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES, FOR D.O.E.

RECORD 00012

GEOTHERM SAMPLE FILE GEOTHERM FILE ID: 0001317
NAME OF SAMPLE SOURCE... NEWSKAH MINERAL SPRINGS
LOCATION TOWNSHIP-RANGE COORDINATES
COUNTRY..... UNITED STATES 16N 009W 09 LAT/LONG... 46-50. N 123-48. W
STATE..... WASHINGTON B&M: W
COUNTY..... GRAYS HARBOR
MAP REFERENCE..... ABERDEEN 1:24000
SAMPLE DESCRIPTION AND CONDITIONS
DATE/COLLECTOR..... KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
SAMPLE NUMBER..... NSB-1
TEMPERATURE (C)..... 19.0
DISCHARGE..... E 400. L/MIN
WATER ANALYSIS
SPECIFIC CONDUCTANCE..... 390.
ANALYSIS IN MG/L ISOTOPES (0/00)
AG.... CO3..... LI... 0.01
AL.... CR..... MG... 1.7
B..... F..... NA... 82. SIO2. 52.
CA.... 5.
REFERENCE AND IDENTIFICATION

COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, M.A., WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES, FOR D.O.E.

RECORD 00013

GEOTHERM SAMPLE FILE — GEOTHERM FILE ID: 0000046

NAME OF SAMPLE SOURCE... GOLDMEYER HOT SPRINGS

LOCATION — TOWNSHIP-RANGE — COORDINATES

COUNTRY..... UNITED STATES — 23N 011E 15 NE — LAT/LONG... 47-29.0 N 121-23.1 W
STATE..... WASHINGTON — B&M: WILLAMETTE
COUNTY..... KING
GEOLOGIC PROVINCE.. 39
MAP REFERENCE..... SNOQUALIMIE PASS 15'

SAMPLE DESCRIPTION AND CONDITIONS

DATE/COLLECTOR..... 1980/08/04
TEMPERATURE (C)..... 50.
DISCHARGE..... L/MIN
OTHER SAMPLE INFORMATION.. SULFIDE AS H2S = 0.6

WATER ANALYSIS

PH..... 8.48
SPECIFIC CONDUCTANCE..... 642.
CHARGE IMBALANCE (% DIFF)... 5.0

ANALYSIS IN MG/L — ISOTOPES (0/00)

AL....		CR.....		MG...	0.04		
B.....	L 1.	F.....	0.88	NA...	125.	SIO2..	56.
BE....		FE(TOT).		NB...		SO4..	40.
CA....	6.3	HCO3....	61.				
CL....	130.						
CO....		K.....	3.0				

REFERENCE AND IDENTIFICATION

COMPILED BY..... MARINER, R. H.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... MARINER AND OTHERS, 1982

RECORD 00014

GEOTHERM SAMPLE FILE — GEOTHERM FILE ID: 0001310

NAME OF SAMPLE SOURCE... GOLDMEYER HOT SPRINGS

LOCATION — TOWNSHIP-RANGE — COORDINATES

COUNTRY..... UNITED STATES — 23N 011E 14 NW
STATE..... WASHINGTON — B&M: W — UTM ZONE... +10
COUNTY..... KING — NORTHING... 5260240.
GEOLOGIC PROVINCE.. — 621290.
MAP REFERENCE..... SNOQUALMIE PASS 1:62500

SAMPLE DESCRIPTION AND CONDITIONS

DATE/COLLECTOR..... KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
TEMPERATURE (C)..... E 53.

REFERENCE AND IDENTIFICATION

COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, M.A., WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES, FOR D.O.E.

RECORD 00015

GEOTHERM SAMPLE FILE — GEOTHERM FILE ID: 0001313

NAME OF SAMPLE SOURCE... LESTER HOT SPRINGS

LOCATION — TOWNSHIP-RANGE — COORDINATES

COUNTRY..... UNITED STATES — 20N 010E 21
STATE..... WASHINGTON — B&M: W
COUNTY..... KING
GEOLOGIC PROVINCE..
MAP REFERENCE..... GREEN WATER 1:62500

UTM ZONE... +10
NORTHING... 5229000.
610000.

SAMPLE DESCRIPTION AND CONDITIONS

DATE/COLLECTOR..... 1979/08/00 KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
SAMPLE NUMBER..... LSF-1
TEMPERATURE (C)..... 45.

WATER ANALYSIS

ANALYSIS IN MG/L — ISOTOPES (0/00)

AG....	CO3.....	LI...	0.33		
AL....	CR.....	MG...	0.2		
B.....	F.....	NA...	112.	SIO2.	66.
CA.... 8.					
CL.... 200.					
CO....	K..... 3.				

REFERENCE AND IDENTIFICATION

COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, M. A., WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES, FOR D.O.E.

RECORD 00016

GEOTHERM SAMPLE FILE — GEOTHERM FILE ID: 0001312

NAME OF SAMPLE SOURCE... LESTER HOT SPRINGS

LOCATION — TOWNSHIP-RANGE — COORDINATES

COUNTRY..... UNITED STATES — 20N 010E 21
STATE..... WASHINGTON — B&M: W
COUNTY..... KING
GEOLOGIC PROVINCE..
MAP REFERENCE..... GREEN WATER 1:62500

UTM ZONE... +10
NORTHING... 5229000.
610000.

OTHER LOCALITY INFORMATION: WEST OF MAIN AREA, FAR SIDE OF CREEK DRAINAGE, 3 METERS ABOVE RIVER

SAMPLE DESCRIPTION AND CONDITIONS

DATE/COLLECTOR..... 1979/08/00 KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
SAMPLE NUMBER..... LSE-1
TEMPERATURE (C)..... 45.
DISCHARGE..... 38. L/MIN
PERTINENT LITHOLOGY..... FLOWING FROM BEDROCK FRACTURES

WATER ANALYSIS

ANALYSIS IN MG/L — ISOTOPES (0/00)

AG....	CO3.....	LI...	0.33		
AL....	CR.....	MG...	0.1		
B.....	F.....	NA...	98.	SIO2.	67.
CA.... 12.					
CL.... 200.					
CO....	K..... 2.				

REFERENCE AND IDENTIFICATION

COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, M.A., WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES, FOR D.O.E.

RECORD 00017

GEOTHERM_SAMPLE_FILE — GEOTHERM FILE ID: 0001311

NAME OF SAMPLE SOURCE... LESTER HOT SPRINGS

LOCATION — TOWNSHIP-RANGE — COORDINATES

COUNTRY..... UNITED STATES — 20N 010E 21

STATE..... WASHINGTON — B&M: W

COUNTY..... KING

GEOLOGIC PROVINCE..

MAP REFERENCE..... GREEN WATER 1:62500

UTM ZONE... +10

NORTHING... 5229000.

610000.

OTHER LOCALITY INFORMATION: SPRING IN SMALL CAVE ON HILLSIDE ABOVE NORTH BANK OF RIVER JUST BELOW THE ROAD

SAMPLE DESCRIPTION AND CONDITIONS

DATE/COLLECTOR..... 1979/08/00 KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES

SAMPLE NUMBER..... LSA-1

POINT OF COLLECTION.. MAIN SPRING

TEMPERATURE (C)..... 48.4

DISCHARGE..... 20. L/MIN

OTHER SAMPLE INFORMATION.. TOTAL DISCHARGE AT LESTER HOT SPRINGS IS ESTIMATED TO BE 200. L/MIN.

WATER_ANALYSIS

SPECIFIC CONDUCTANCE..... 520.

ANALYSIS IN MG/L — ISOTOPES (0/00)

AG....		CO3.....		LI...	0.35		
AL....		CR.....		MG...	0.1		
B.....		F.....		NA...	104.	SIO2.	67.
BE....		FE(TOT).		NB...		SO4..	30.
CA....	7.						
CL....	215.						
CO....		K.....	3.				

REFERENCE AND IDENTIFICATION

COMPILED BY..... LIEB, RANDY, J.

COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY

REFERENCE..... *KOROSEC, M.A., WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES, FOR D.O.E.

RECORD 00018

GEOTHERM_SAMPLE_FILE — GEOTHERM FILE ID: 0000042

NAME OF SAMPLE SOURCE... LESTER HOT SPRINGS

LOCATION — TOWNSHIP-RANGE — COORDINATES

COUNTRY..... UNITED STATES — 20N 010E 21

STATE..... WASHINGTON — B&M: WILLAMETTE

COUNTY..... KING

GEOLOGIC PROVINCE.. 39

MAP REFERENCE..... GREENWATER 15'

LAT/LONG... 47-12.5 N 121-32.2 W

SAMPLE DESCRIPTION AND CONDITIONS

DATE/COLLECTOR..... 1980/07/30

TEMPERATURE (C)..... 46.5

DISCHARGE..... L/MIN

OTHER SAMPLE INFORMATION.. SULFIDE AS H2S = 5.7

WATER_ANALYSIS

PH..... 9.19

SPECIFIC CONDUCTANCE..... 543.

CHARGE IMBALANCE (% DIFF)... 3.4

ANALYSIS IN MG/L — ISOTOPES (0/00)

AL....		CR.....		MG...	0.03		
B.....	L 1.	F.....	1.6	NA...	105.	SIO2.	61.

BE....		FE(TOT).		NB...	
CA....	5.3	HCO3....	61.		
CL....	115.				
CO....		K.....	2.0		

				SO4..	19.

REFERENCE AND IDENTIFICATION
COMPILED BY..... MARINER, R. H.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... MARINER AND OTHERS, 1982

RECORD 00019

GEOTHERM SAMPLE FILE — GEOTHERM FILE ID: 0000043
NAME OF SAMPLE SOURCE... SCENIC HOT SPRINGS

LOCATION — TOWNSHIP-RANGE — COORDINATES
COUNTRY..... UNITED STATES — 26N 013E 33 NW — LAT/LONG... 47-42.4 N 121-08.5 W
STATE..... WASHINGTON — B&M: WILLAMETTE
COUNTY..... KING
GEOLOGIC PROVINCE.. 39
MAP REFERENCE..... SCENIC 7.5'

SAMPLE DESCRIPTION AND CONDITIONS
DATE/COLLECTOR..... 1980/08/01
TEMPERATURE (C)..... 47.
DISCHARGE..... L/MIN
OTHER SAMPLE INFORMATION.. SULFIDE AS H2S = 1.3

WATER ANALYSIS
PH..... 9.14
SPECIFIC CONDUCTANCE..... 235.
CHARGE IMBALANCE (% DIFF)... 4.3
ANALYSIS IN MG/L — ISOTOPES (O/OOO)

AL....		CR.....		MG...	0.02		
B.....	L 1.	F.....	0.72	NA...	49.	SIO2.	44.
BE....		FE(TOT).		NB...		SO4..	13.
CA....	2.1	HCO3....	75.				
CL....	22.						
CO....		K.....	0.64				

REFERENCE AND IDENTIFICATION
COMPILED BY..... MARINER, R. H.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... MARINER AND OTHERS, 1982

RECORD 00020

GEOTHERM SAMPLE FILE — GEOTHERM FILE ID: 0001314
NAME OF SAMPLE SOURCE... SCENIC HOT SPRINGS
WARING NUMBER..... 07.

LOCATION — TOWNSHIP-RANGE — COORDINATES
COUNTRY..... UNITED STATES — 26N 013E 32 NE — LAT/LONG... 47-42.42 N 121-09.30 W
STATE..... WASHINGTON — B&M: W
COUNTY..... KING
MAP REFERENCE..... SCENIC 1:24000

SAMPLE DESCRIPTION AND CONDITIONS
DATE/COLLECTOR..... KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
TEMPERATURE (C)..... 50.
DISCHARGE..... 110. L/MIN

WATER ANALYSIS
SPECIFIC CONDUCTANCE..... 2350.

REFERENCE AND IDENTIFICATION
COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES; BERRY AND OTHERS, 1980

RECORD 00021

GEOTHERM SAMPLE FILE — GEOTHERM FILE ID: 0001315
NAME OF SAMPLE SOURCE... FISH HATCH WARM SPRING
LOCATION — TOWNSHIP-RANGE — COORDINATES
COUNTRY..... UNITED STATES — 06N 013E 04 SE OF NE
STATE..... WASHINGTON — B&M: W — UTM ZONE... +10
COUNTY..... KLICKITAT — NORTHING... 5099900.
GEOLOGIC PROVINCE.. — 641000.
MAP REFERENCE..... OUTLET FALLS 1:24000
SAMPLE DESCRIPTION AND CONDITIONS
DATE/COLLECTOR..... KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
TEMPERATURE (C)..... 24.
DISCHARGE..... 15. L/MIN
WATER ANALYSIS
SPECIFIC CONDUCTANCE..... 1660.
REFERENCE AND IDENTIFICATION
COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, M.A., WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES, FOR D.O.E.

RECORD 00022

GEOTHERM SAMPLE FILE — GEOTHERM FILE ID: 0000074
NAME OF SAMPLE SOURCE... FISH HATCHERY WARM SPRING
LOCATION — TOWNSHIP-RANGE — COORDINATES
COUNTRY..... UNITED STATES — LAT/LONG... 46-02.5 N 121-10.9 W
STATE..... WASHINGTON
COUNTY..... KLICKITAT
GEOLOGIC PROVINCE.. 39
SAMPLE DESCRIPTION AND CONDITIONS
TEMPERATURE (C)..... 24.
REFERENCE AND IDENTIFICATION
COMPILED BY..... R. MARINER
REFERENCE..... BERRY, 1980

RECORD 00023

GEOTHERM SAMPLE FILE — GEOTHERM FILE ID: 0000048
NAME OF SAMPLE SOURCE... KLICKITAT MINERAL SPRING
LOCATION — TOWNSHIP-RANGE — COORDINATES
COUNTRY..... UNITED STATES — LAT/LONG... 45-49.3 N 121-08.0 W
STATE..... WASHINGTON
COUNTY..... KLICKITAT
GEOLOGIC PROVINCE.. 39
SAMPLE DESCRIPTION AND CONDITIONS
TEMPERATURE (C)..... 21.
REFERENCE AND IDENTIFICATION
COMPILED BY..... R. MARINER
REFERENCE..... BERRY, 1980

RECORD 00024

GEOTHERM SAMPLE FILE — GEOTHERM FILE ID: 0001316

NAME OF SAMPLE SOURCE... KLICKITAT MINERAL SPRING

LOCATION
- COUNTRY..... UNITED STATES
- STATE..... WASHINGTON
- COUNTY..... KLICKITAT
- MAP REFERENCE..... KLICKITAT 1:62500
- OTHER LOCALITY INFORMATION: LOCATION VAGUE

TOWNSHIP-RANGE: 04N 013E 23, 24 B&M: W

COORDINATES: LAT/LONG... 45-49.26 N 121-07.98 W

SAMPLE DESCRIPTION AND CONDITIONS
- DATE/COLLECTOR..... KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
- TEMPERATURE (C)..... E 27.

REFERENCE AND IDENTIFICATION
- COMPILED BY..... LIEB, RANDY, J.
- COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
- REFERENCE..... *KOROSEC, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES; BERRY AND OTHERS, 1980

RECORD 00025

GEOTHERM SAMPLE FILE — GEOTHERM FILE ID: 0000771

NAME OF SAMPLE SOURCE... OHANAPECOSH HOT SPRINGS

LOCATION
- COUNTRY..... UNITED STATES
- STATE..... WASHINGTON
- COUNTY..... LEWIS
- GEOLOGIC PROVINCE..

TOWNSHIP-RANGE

COORDINATES: LAT/LONG... 46-44.20 N 121-33.60 W; UTM ZONE... 10; NORTHING... 5176690.; 610016.

SAMPLE DESCRIPTION AND CONDITIONS
- TEMPERATURE (C)..... 40.0

WATER ANALYSIS
- PH..... 7.0

ANALYSIS

AG....	CO3.....	LI...	3.3		
AL....	CR.....	MG...	7.5		
B.....	F.....	NA...	981.	SIO2.	80.
CA.... 85.					
CL.... 869.					
CO....	K.....	51.			

ISOTOPES (O/OO)

REFERENCE AND IDENTIFICATION
- COMPILED BY..... RENNER, J.
- COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
- REFERENCE..... WHITE AND WILLIAMS, 1975; CAMPBELL AND OTHERS, 1979

RECORD 00026

GEOTHERM SAMPLE FILE — GEOTHERM FILE ID: 0001318

NAME OF SAMPLE SOURCE... OHANAPECOSH HOT SPRINGS
- MARING NUMBER..... 11

LOCATION
- COUNTRY..... UNITED STATES
- STATE..... WASHINGTON
- COUNTY..... LEWIS
- GEOLOGIC PROVINCE..
- MAP REFERENCE..... PACKWOOD 1:62500
- OTHER LOCALITY INFORMATION: EAST SIDE OF OHANAPECOSH RIVER

TOWNSHIP-RANGE: 14N 010E 04 NW B&M: W

COORDINATES: LAT/LONG... 46-44.20 N 121-33.60 W; UTM ZONE... 10; NORTHING... 5177100.; 610000.

SAMPLE DESCRIPTION AND CONDITIONS
DATE/COLLECTOR..... 1979/08/00 KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
SAMPLE NUMBER..... OHA-1
POINT OF COLLECTION.. EAST OF NATURE TRAIL, FIRST SPRINGS WHEN FOLLOWING THE NATURE TRAIL IN A COUNTER CLOCKWISE DIRECTION
TEMPERATURE (C)..... 39.5
DISCHARGE..... 28. L/MIN
OTHER SAMPLE INFORMATION.. TOTAL FLOW 100.-120. L/MIN (ESTIMATED)
WATER ANALYSIS
SPECIFIC CONDUCTANCE..... 4400.
ANALYSIS IN MG/L

						ISOTOPES (0/00)	
AG....		CO3.....		LI...	2.8		
AL....		CR.....		MG...	5.1		
B.....		F.....		NA...	895.	SIO2.	106.
BE....		FE(TOT).		NB...		SO4..	175.
CA....	68.						
CL....	1610.						
CO....		K.....	47.				

QUALIFICATION FIELD..... RANGE 5.-10. GPM
REFERENCE AND IDENTIFICATION
COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, M.A., WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES, FOR D.O.E.

RECORD 00027

GEOTHERM SAMPLE FILE GEOTHERM FILE ID: 0001320
NAME OF SAMPLE SOURCE... OHANAPECOSH HOT SPRINGS
MARING NUMBER..... 11
LOCATION

		TOWNSHIP-RANGE			COORDINATES	
COUNTRY.....	UNITED STATES	14N 01OE	04	NW	LAT/LONG...	46-44.20 N 121-33.60 W
STATE.....	WASHINGTON	B&M: W			UTM ZONE...	+10
COUNTY.....	LEWIS				NORTHING...	5177100.
GEOLOGIC PROVINCE..						610000.
MAP REFERENCE.....	PACKWOOD 1:62500					

OTHER LOCALITY INFORMATION: JUST NORTH OF SAMPLE OHB-1 LOCATION
SAMPLE DESCRIPTION AND CONDITIONS
DATE/COLLECTOR..... 1979/08/00 KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
SAMPLE NUMBER..... OHC-1
POINT OF COLLECTION.. POOL ONE METER WIDE
TEMPERATURE (C)..... 43.6
DISCHARGE..... 11. L/MIN
WATER ANALYSIS
ANALYSIS IN MG/L

						ISOTOPES (0/00)	
AG....		CO3.....		LI...	2.8		
AL....		CR.....		MG...	4.9		
B.....		F.....		NA...	825.	SIO2.	108.
CA....	64.						
CL....	987.						
CO....		K.....	44.				

REFERENCE AND IDENTIFICATION
COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, M.A., WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES, FOR D.O.E.

RECORD 00028

GEOTHERM SAMPLE FILE — GEOTHERM FILE ID: 0001319

NAME OF SAMPLE SOURCE... OHANAPECOSH HOT SPRINGS
WARING NUMBER..... 11

LOCATION — TOWNSHIP-RANGE — COORDINATES

COUNTRY.....	UNITED STATES	14N 010E 04 NW	LAT/LONG... 46-44.20 N 121-33.60 W
STATE.....	WASHINGTON	B&M: W	UTM ZONE... +10
COUNTY.....	LEWIS		NORTHING... 5177100.
GEOLOGIC PROVINCE..			610000.
MAP REFERENCE.....	PACKWOOD 1:62500		

OTHER LOCALITY INFORMATION: IMMEDIATELY NORTH ALONG PATH FROM FIRST SPRINGS(SAMPLE OHA-1)

SAMPLE DESCRIPTION AND CONDITIONS

DATE/COLLECTOR..... 1979/08/00 KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
SAMPLE NUMBER..... OHA-1
POINT OF COLLECTION.. POOL MEASURING TWO TO THREE METERS ACROSS
TEMPERATURE (C)..... 45.6
DISCHARGE..... 2140. L/MIN

WATER ANALYSIS

SPECIFIC CONDUCTANCE..... 4500.

ANALYSIS IN MG/L — ISOTOPES (O/OO)

AG....		CO3.....		LI...	2.8		
AL....		CR.....		MG...	4.9		
B.....		F.....		NA...	889.	SIO2.	107.
CA....	65.						
CL....	1000.						
CO.....		K.....	47.				

REFERENCE AND IDENTIFICATION

COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, M.A., WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES, FOR D.O.E.

RECORD 00029

GEOTHERM SAMPLE FILE — GEOTHERM FILE ID: 0001323

NAME OF SAMPLE SOURCE... OHANAPECOSH HOT SPRINGS
KGRA..... 11

LOCATION — TOWNSHIP-RANGE — COORDINATES

COUNTRY.....	UNITED STATES	14N 010E 04 NW	LAT/LONG... 46-44.20 N 121-33.60 W
STATE.....	WASHINGTON	B&M: W	UTM ZONE... +10
COUNTY.....	LEWIS		NORTHING... 5177100.
GEOLOGIC PROVINCE..			610000.
MAP REFERENCE.....	PACKWOOD 1:62500		

OTHER LOCALITY INFORMATION: 250. METERS FROM OTHER SPRINGS, ON THE FAR NW CORNER OF THE CAMPGROUND

SAMPLE DESCRIPTION AND CONDITIONS

DATE/COLLECTOR..... 1979/08/00 KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
SAMPLE NUMBER..... OHH-1
POINT OF COLLECTION.. POOL, 1/2 METER WIDE.
TEMPERATURE (C)..... 30.6
OTHER SAMPLE INFORMATION.. SEVERAL OLD TUFAS SURROUND THE AREA

WATER ANALYSIS

ANALYSIS IN MG/L — ISOTOPES (O/OO)

AG....		CO3.....		LI...	2.8		
AL....		CR.....		MG...	5.5		
B.....		F.....		NA...	870.	SIO2.	98.

CA.... 69.
CL.... 978.
CO.... K..... 46.

REFERENCE AND IDENTIFICATION
COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, M.A., WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES, FOR D.O.E.

RECORD 00030

GEOTHERM SAMPLE FILE GEOTHERM FILE ID: 0001322
NAME OF SAMPLE SOURCE... OHANAPECOSH HOT SPRINGS
WARING NUMBER..... 11

LOCATION — TOWNSHIP-RANGE — COORDINATES
COUNTRY..... UNITED STATES — 14N 010E 04 NW — LAT/LONG... 46-44.20 N 121-33.60 W
STATE..... WASHINGTON — B&M: W — UTM ZONE... +10
COUNTY..... LEWIS — NORTHING... 5177100.
GEOLOGIC PROVINCE.. — 610000.
MAP REFERENCE..... PACKWOOD 1:62500
OTHER LOCALITY INFORMATION: WEST OF MAIN SPRING AREA, NEAR TOP OF LARGE TUFA TERRACE

SAMPLE DESCRIPTION AND CONDITIONS
DATE/COLLECTOR..... 1979/08/00 KOROSEC, M.A. WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
SAMPLE NUMBER..... OHG-1
POINT OF COLLECTION.. CRUSTED-OVER PIPE
TEMPERATURE (C)..... 47.8
DISCHARGE..... 25. L/MIN
DEPOSITS OR ALTERATION.... TUFA TERRACE

WATER ANALYSIS
ANALYSIS IN MG/L — ISOTOPES (O/OO)
AG.... CO3..... LI... 2.8
AL.... CR..... MG... 895.
B..... F..... NA... SIO2. 106.
BE.... FE(TOT). NB... SO4.. 175.
CA.... 58.
CL.... 1050.
CO.... K..... 48.
QUALIFICATION FIELD..... RANGE 5.- 8. GPM

REFERENCE AND IDENTIFICATION
COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, M.A., WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES, FOR D.O.E.

RECORD 00031

GEOTHERM SAMPLE FILE GEOTHERM FILE ID: 0001321
NAME OF SAMPLE SOURCE... OHANAPECOSH HOT SPRINGS
WARING NUMBER..... 11

LOCATION — TOWNSHIP-RANGE — COORDINATES
COUNTRY..... UNITED STATES — 14N 010E 04 NW — LAT/LONG... 46-44.20 N 121-33.60 W
STATE..... WASHINGTON — B&M: W — UTM ZONE... +10
COUNTY..... LEWIS — NORTHING... 5177100.
GEOLOGIC PROVINCE.. — 610000.
MAP REFERENCE..... PACKWOOD 1:62500
OTHER LOCALITY INFORMATION: EIGHT METERS NORTH OF SAMPLE OHC-1 LOCATION

SAMPLE DESCRIPTION AND CONDITIONS
DATE/COLLECTOR..... 1979/08/00 KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES

SAMPLE NUMBER..... OHD-1
POINT OF COLLECTION.. POOL
TEMPERATURE (C)..... 50.1
DISCHARGE..... 68. L/MIN
WATER ANALYSIS
SPECIFIC CONDUCTANCE..... 4650.
ANALYSIS IN MG/L

AG....		CO3.....		LI...	2.8		
AL....		CR.....		MG...	4.9		
B.....		F.....		NA...	895.	SIO2.	107.
BE....		FE(TOT).		NB...		SO4..	165.
CA....	64.						
CL....	1030.						
CO....		K.....	50.				

ISOTOPES (0/00)

QUALIFICATION FIELD..... RANGE 15.-20.GPM
REFERENCE AND IDENTIFICATION
COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, M.A., WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES, FOR D.O.E.

RECORD 00032

GEOTHERM SAMPLE FILE GEOTHERM FILE ID: 0001324
NAME OF SAMPLE SOURCE... PACKWOOD HOT SPRING
LOCATION — TOWNSHIP-RANGE — COORDINATES
COUNTRY..... UNITED STATES — 13N 009E 32 — LAT/LONG... 46-34.50 N 121-42.36 W
STATE..... WASHINGTON — B&M: W
COUNTY..... LEWIS
MAP REFERENCE..... PACKWOOD 1:62500
OTHER LOCALITY INFORMATION: LOCATION APPROXIMATE
SAMPLE DESCRIPTION AND CONDITIONS
DATE/COLLECTOR..... KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
TEMPERATURE (C)..... E 38.
REFERENCE AND IDENTIFICATION
COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES; BERRY AND OTHERS, 1980

RECORD 00033

GEOTHERM SAMPLE FILE GEOTHERM FILE ID: 0000060
NAME OF SAMPLE SOURCE... PACKWOOD HOT SPRING
LOCATION — TOWNSHIP-RANGE — COORDINATES
COUNTRY..... UNITED STATES — LAT/LONG... 46-34.5 N 121-42.4 W
STATE..... WASHINGTON
COUNTY..... LEWIS
GEOLOGIC PROVINCE.. 39
SAMPLE DESCRIPTION AND CONDITIONS
TEMPERATURE (C)..... 38.
REFERENCE AND IDENTIFICATION
COMPILED BY..... R. MARINER
REFERENCE..... BERRY AND OTHERS, 1980

RECORD 00034

GEOTHERM SAMPLE FILE GEOTHERM FILE ID: 0000761

NAME OF SAMPLE SOURCE... SUMMIT CREEK MINERAL SPRINGS (SODA SPRINGS)
WARING NUMBER..... 06

LOCATION — TOWNSHIP-RANGE — COORDINATES
COUNTRY..... UNITED STATES — 007E — LAT/LONG... 46-42.20 N 121-29.00 W
STATE..... WASHINGTON — UTM ZONE... +10
COUNTY..... LEWIS — NORTHING... 5173096.
GEOLOGIC PROVINCE.. — 615945.
MAP REFERENCE..... BREITENBUSH HOT SPRINGS 1:62500, CANYON CITY 1:250000

SAMPLE DESCRIPTION AND CONDITIONS
TEMPERATURE (C)..... 13.0

WATER ANALYSIS
PH..... 6.0

ANALYSIS — ISOTOPES (O/OO)

AG....		CO3.....		LI...	5.9		
AL....		CR.....		MG...	88.		
AS....		CS.....		MN...		SC...	
B.....		F.....		NA...	1790.	SIO2.	170.
CA....	278.						
CL....	1552.						
CO....		K.....	87.				

DEL O(18) OF SO4..... -2.67

REFERENCE AND IDENTIFICATION
COMPILED BY..... RENNER, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... WHITE AND WILLIAMS, 1975; CAMPBELL AND OTHERS, 1970

RECORD 00035

GEOTHERM SAMPLE FILE — GEOTHERM FILE ID: 0001325
NAME OF SAMPLE SOURCE... HOT LAKE

LOCATION — TOWNSHIP-RANGE — COORDINATES
COUNTRY..... UNITED STATES — 40N 027E 18 NE — LAT/LONG... 48-58.44 N 119-28.50 W
STATE..... WASHINGTON — B&M: W
COUNTY..... OKANOGAN
MAP REFERENCE..... OROVILLE NW 1:24000

SAMPLE DESCRIPTION AND CONDITIONS
DATE/COLLECTOR..... KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
TEMPERATURE (C)..... R 45.
QUALIFICATION FIELD..... RANGE 40. TO 50. C

REFERENCE AND IDENTIFICATION
COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES; BERRY AND OTHERS, 1980

RECORD 00036

GEOTHERM SAMPLE FILE — GEOTHERM FILE ID: 0001326
NAME OF SAMPLE SOURCE... POISON LAKE

LOCATION — TOWNSHIP-RANGE — COORDINATES
COUNTRY..... UNITED STATES — 39N 027E 05 SE — LAT/LONG... 48-54.36 N 119-27.30 W
STATE..... WASHINGTON — B&M: W
COUNTY..... OKANOGAN
MAP REFERENCE..... OROVILLE 1:62500

SAMPLE DESCRIPTION AND CONDITIONS
DATE/COLLECTOR..... KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
TEMPERATURE (C)..... R 45.
QUALIFICATION FIELD..... RANGE 40. TO 50. C

REFERENCE AND IDENTIFICATION
COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES; BERRY AND OTHERS, 1980

RECORD 00037

GEOTHERM SAMPLE FILE — GEOTHERM FILE ID: 0000759
NAME OF SAMPLE SOURCE... LONGMIRE

LOCATION — TOWNSHIP-RANGE — COORDINATES
COUNTRY..... UNITED STATES — LAT/LONG... 46-45.10 N 121-48.70 W
STATE..... WASHINGTON — UTM ZONE... +10
COUNTY..... PIERCE — NORTHING... 5178036.
GEOLOGIC PROVINCE.. — 590764.

SAMPLE DESCRIPTION AND CONDITIONS
TEMPERATURE (C)..... 21.0

WATER ANALYSIS
PH..... 6.0

ANALYSIS — ISOTOPES (0/00)

AG....		CO3.....		LI...	1.8		
AL....		CR.....		MG...	151.		
B.....		F.....		NA...	402.	SIO2.	170.
CA....	298.						
CL....	615.						
CO....		K.....	37.				

REFERENCE AND IDENTIFICATION
COMPILED BY..... RENNER, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... WHITE AND WILLIAMS, 1975; CAMPBELL AND OTHERS, 1970

RECORD 00038

GEOTHERM SAMPLE FILE — GEOTHERM FILE ID: 0000172
NAME OF SAMPLE SOURCE... LONGMIRE MINERAL SPRING

LOCATION — TOWNSHIP-RANGE — COORDINATES
COUNTRY..... UNITED STATES — LAT/LONG... 46-45. N 121-45.5 W
STATE..... WASHINGTON
COUNTY..... PIERCE
GEOLOGIC PROVINCE.. 39

SAMPLE DESCRIPTION AND CONDITIONS
DATE/COLLECTOR..... 1977/07/24 MARINER, R. AND EVANS, W.
SAMPLE NUMBER..... CO113RM//
TEMPERATURE (C)..... 19.

WATER ANALYSIS
DATE/ANALYST..... 1977/12 BARNES GROUP
PH..... 6.35
SPECIFIC CONDUCTANCE..... 4920.
ALKALINITY..... 2700. AS HCO3
CHARGE IMBALANCE (% DIFF)... 0.5

ANALYSIS IN MG/L — ISOTOPES (0/00)

AG....		CO3.....		LI...	2.2		
AL....		CR.....		MG...	170.		
AS....		CS.....	L 0.1	MN...	2.6		
AU....		CU.....	L 0.01				
B.....	3.7	F.....	0.46	NA...	580.	SIO2.	125.
BE....		FE(TOT).	11.	NB...		SO4..	41.

BR.... 2.8 GE..... NI... L 0.04
CA.... 540. HCO3.... 2700.
CA+MG. MG..... L 0.0001 PB... L 0.05
CO.... L 0.01 H2S..... L 1.
CL.... 810. I..... L 0.1
CO... L 0.02 K..... 46. RB... 0.1 ZN... 0.03

GAS ANALYSIS
DATE/ANALYST..... 1977/12 BARNES GROUP
ANALYSIS IN VOL % ISOTOPES (00/00)
AR... L 0.02
CH4.. L 0.005
C2H6. L 0.05 N2... 0.09
CO2.. 98.34 O2... 0.04
H2... L 0.01
HE... L 0.02

REFERENCE AND IDENTIFICATION
COMPILED BY..... MARINER, R.
COMPILER AFFILIATION... U. S. GEOLOGICAL SURVEY
REFERENCE..... #MARINER, R., USGS, MENLO PARK

RECORD 00039

GEOTHERM SAMPLE FILE GEOTHERM FILE ID: 0001333
NAME OF SAMPLE SOURCE... LONGMIRE MINERAL SPRINGS
LOCATION TOWNSHIP-RANGE COORDINATES
COUNTRY..... UNITED STATES 15N 008E 29 SE
STATE..... WASHINGTON B&M: W UTM ZONE... +10
COUNTY..... PIERCE NORTHING... 5178000.
GEOLOGIC PROVINCE.. 590700.
MAP REFERENCE..... MT RAINIER WEST 1:24000

SAMPLE DESCRIPTION AND CONDITIONS
DATE/COLLECTOR..... 1979/07/00 KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
SAMPLE NUMBER..... LMG-1
POINT OF COLLECTION.. EASTERN EDGE OF IRON TERRACE
TEMPERATURE (C)..... 22.0

WATER ANALYSIS
ANALYSIS IN MG/L ISOTOPES (0/00)
AG.... CO3..... LI... 2.1
B..... F..... NA... 555. SIO2. 102.
BR.... 5.4
CA.... 500.
CL.... 946. I..... 0.03
CO.... K..... 43.

REFERENCE AND IDENTIFICATION
COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... #KOROSEC, M.A., WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES, FOR D.O.E.

RECORD 00040

GEOTHERM SAMPLE FILE GEOTHERM FILE ID: 0001332
NAME OF SAMPLE SOURCE... LONGMIRE MINERAL SPRINGS
LOCATION TOWNSHIP-RANGE COORDINATES
COUNTRY..... UNITED STATES 15N 008E 29 SE
STATE..... WASHINGTON B&M: W UTM ZONE... +10
COUNTY..... PIERCE NORTHING... 5178000.

GEOLOGIC PROVINCE.. 590700.
MAP REFERENCE..... MT RAINIER WEST 1:24000
SAMPLE DESCRIPTION AND CONDITIONS
DATE/COLLECTOR..... 1979/07/00 KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
SAMPLE NUMBER..... LMF-1
POINT OF COLLECTION.. MEDICINE SPRING (POOL)
TEMPERATURE (C)..... 19.1
PERTINENT LITHOLOGY..... ALLUVIUM COVERED EOCENE VOLCANICS WITH DIABASE AND BASALT INTRUSIVES OF OLIGIOCENE TO MIOCENE AGE
WATER ANALYSIS
PH..... 6.6
SPECIFIC CONDUCTANCE..... 6000.
ANALYSIS IN MG/L ISOTOPES (0/000)

AG....		CO3.....		LI...	2.1		
AL....		CR.....		MG...	153.		
B.....		F.....		NA...	568.	SIO2.	128.
BR....	5.4						
CA....	520.						
CL....	915.	I.....	0.04				
CO....		K.....	44.				

REFERENCE AND IDENTIFICATION
COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, M.A., WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES, FOR D.O.E.

RECORD 00041

GEOTHERM SAMPLE FILE GEOTHERM FILE ID: 0001331
NAME OF SAMPLE SOURCE... LONGMIRE MINERAL SPRINGS
LOCATION TOWNSHIP-RANGE COORDINATES
COUNTRY..... UNITED STATES 15N 008E 29 SE
STATE..... WASHINGTON B&M: W UTM ZONE... +10
COUNTY..... PIERCE NORTHING... 5178000.
GEOLOGIC PROVINCE.. 590700.
MAP REFERENCE..... MT RAINIER WEST 1:24000
OTHER LOCALITY INFORMATION: BELOW PATH ACROSS FROM CABIN, NEAR BASE OF A LARGE FIR TREE
SAMPLE DESCRIPTION AND CONDITIONS
DATE/COLLECTOR..... 1979/07/00 KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
SAMPLE NUMBER..... LMF-1
POINT OF COLLECTION.. LITTLE IRON MIKE SPRING
TEMPERATURE (C)..... 11.9
DISCHARGE..... 5.7 L/MIN
WATER ANALYSIS
ANALYSIS IN MG/L ISOTOPES (0/000)

AG....		CO3.....		LI...	0.8		
AL....		CR.....		MG...	63.		
B.....		F.....		NA...	184.	SIO2.	98.
BR....	1.8						
CA....	262.						
CL....	324.	I.....	0.02				
CO....		K.....	19.				

QUALIFICATION FIELD..... RANGE 1 TO 2 GPM
REFERENCE AND IDENTIFICATION
COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, M.A., WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES, FOR D.O.E.

RECORD 00042

GEOTHERM SAMPLE FILE — GEOTHERM FILE ID: 0001330

NAME OF SAMPLE SOURCE... LONGMIRE MINERAL SPRINGS

LOCATION		TOWNSHIP-RANGE		COORDINATES	
COUNTRY.....	UNITED STATES	15N 008E 29	SE		
STATE.....	WASHINGTON	B&M: W		UTM ZONE...	+10
COUNTY.....	PIERCE			NORTHING...	5178000.
GEOLOGIC PROVINCE..					590700.
MAP REFERENCE.....	MT RAINIER WEST 1:24000				

OTHER LOCALITY INFORMATION: AT STONE CISTERN NEAR OLD LOG CABIN

SAMPLE DESCRIPTION AND CONDITIONS

DATE/COLLECTOR..... 1979/07/00 KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
SAMPLE NUMBER..... LMD-1
POINT OF COLLECTION.. IRON MIKE SPRING
TEMPERATURE (C)..... 11.2
DISCHARGE..... 0 15. L/MIN

WATER ANALYSIS

PH..... 5.8
SPECIFIC CONDUCTANCE..... 1920.

ANALYSIS IN MG/L — ISOTOPES (0/00)

AG....		CO3.....		LI...	0.3		
AL....		CR.....		MG...	42.		
B.....		F.....		NA...	72.	SIO2.	82.
BR....	0.7						
CA....	210.						
CL....	112.	I.....	0.01				
CO....		K.....	10.				

QUALIFICATION FIELD..... FLOW REPORTED AS "A FEW GALLONS PER MINUTE"

REFERENCE AND IDENTIFICATION

COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, M.A., WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES, FOR D.O.E.

RECORD 00043

GEOTHERM SAMPLE FILE — GEOTHERM FILE ID: 0001329

NAME OF SAMPLE SOURCE... LONGMIRE MINERAL SPRINGS

LOCATION		TOWNSHIP-RANGE		COORDINATES	
COUNTRY.....	UNITED STATES	15N 008E 29	SE		
STATE.....	WASHINGTON	B&M: W		UTM ZONE...	+10
COUNTY.....	PIERCE			NORTHING...	5178000.
GEOLOGIC PROVINCE..					590700.
MAP REFERENCE.....	MT RAINIER WEST 1:24000				

SAMPLE DESCRIPTION AND CONDITIONS

DATE/COLLECTOR..... 1979/07/00 KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
SAMPLE NUMBER..... LMC-1
POINT OF COLLECTION.. MARSH SPRING (RIM SPRING)
TEMPERATURE (C)..... 25.1

WATER ANALYSIS

PH..... 6.2
SPECIFIC CONDUCTANCE..... 6550.

ANALYSIS IN MG/L — ISOTOPES (0/00)

AG....		CO3.....		LI...	2.4		
B.....		F.....		NA...	645.	SIO2.	141.

BR.... 6.2
CA.... 582.
CL.... 1204. I..... 0.04
CO.... K..... 51.

REFERENCE AND IDENTIFICATION
COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, M.A., WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES, FOR D.O.E.

RECORD 00044

GEOTHERM SAMPLE FILE GEOTHERM FILE ID: 0001328
NAME OF SAMPLE SOURCE... LONGMIRE MINERAL SPRINGS

LOCATION TOWNSHIP-RANGE COORDINATES
COUNTRY..... UNITED STATES 15N 008E 29 SE
STATE..... WASHINGTON B&M: W UTM ZONE... +10
COUNTY..... PIERCE NORTHING... 5178000.
GEOLOGIC PROVINCE.. 590700.
MAP REFERENCE..... MT RAINIER WEST 1:24000

SAMPLE DESCRIPTION AND CONDITIONS
DATE/COLLECTOR..... 1979/07/00 KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
SAMPLE NUMBER..... LMR-1
TEMPERATURE (C)..... 13.3

WATER ANALYSIS
PH..... 5.2
SPECIFIC CONDUCTANCE..... 600.
ANALYSIS IN MG/L ISOTOPES (0/00)
AG.... CO3..... LI... 0.1
AL.... CR..... MG... 15.
B..... F..... NA... 50. SIO2. 31.
BE.... FE(TOT). NB... SO4.. 5.
BR.... 0.4
CA.... 43.
CL.... 63. I..... 0.01
CO.... K..... 4.

REFERENCE AND IDENTIFICATION
COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, M.A., WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES, FOR D.O.E.

RECORD 00045

GEOTHERM SAMPLE FILE GEOTHERM FILE ID: 0001327
NAME OF SAMPLE SOURCE... LONGMIRE MINERAL SPRINGS

LOCATION TOWNSHIP-RANGE COORDINATES
COUNTRY..... UNITED STATES 15N 008E 29 SE
STATE..... WASHINGTON B&M: W UTM ZONE... +10
COUNTY..... PIERCE NORTHING... 5178000.
GEOLOGIC PROVINCE.. 590700.
MAP REFERENCE..... MT RAINIER WEST 1:24000
OTHER LOCALITY INFORMATION: LOCATED IN THE MEADOW NORTH OF STATE HWY 706, ACROSS FROM THE NATIONAL PARK HEADQUARTERS

SAMPLE DESCRIPTION AND CONDITIONS
DATE/COLLECTOR..... 1979/07/00 KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
SAMPLE NUMBER..... LMA-1
POINT OF COLLECTION.. POST SPRING
TEMPERATURE (C)..... 22.

PERTINENT LITHOLOGY..... ALLUVIUM COVERED EOCENE VOLCANICS WITH DIABASE AND BASALT INTRUSIVES OF OLIGIOCENE TO MIOCENE AGE.
OTHER SAMPLE INFORMATION.. ESTIMATED TOTAL FLOW IS 250. L/MIN.

WATER ANALYSIS

PH..... 6.0
SPECIFIC CONDUCTANCE..... 5400.

ANALYSIS IN MG/L

						ISOTOPES (0/00)	
AG....		CO3.....		LI...	1.9		
AL....		CR.....		MG...	150.		
B.....		F.....		NA...	508.	SIO2.	112.
BE....		FE(TOT).		NB...		SO4..	40.
BR....	5.3						
CA....	460.						
CL....	870.	I.....	0.05				
CO....		K.....	43.				

REFERENCE AND IDENTIFICATION

COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, M.A., WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES, FOR D.O.E.

RECORD 00046

GEOTHERM SAMPLE FILE — GEOTHERM FILE ID: 0001334

NAME OF SAMPLE SOURCE... MT. RAINIER FUMAROLES

LOCATION — TOWNSHIP-RANGE — COORDINATES

COUNTRY..... UNITED STATES — 16N 008E 23 — LAT/LONG... 46-51.12 N 121-45.48 W
STATE..... WASHINGTON — B&M: W
COUNTY..... PIERCE
MAP REFERENCE..... MT RAINIER WEST 1:24000
OTHER LOCALITY INFORMATION: LOCATION APPROXIMATE

SAMPLE DESCRIPTION AND CONDITIONS

DATE/COLLECTOR..... KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
TEMPERATURE (C)..... R 62.
QUALIFICATION FIELD,.... RANGE 52. TO 72. C

REFERENCE AND IDENTIFICATION

COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, M.A., WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES, FOR D.O.E.; BERRY 1980

RECORD 00047

GEOTHERM SAMPLE FILE — GEOTHERM FILE ID: 0000047

NAME OF SAMPLE SOURCE... BONNEVILLE HOT SPRINGS

LOCATION — TOWNSHIP-RANGE — COORDINATES

COUNTRY..... UNITED STATES — 02N 007E 39 NW — LAT/LONG... 45-39.4 N 121-57.5 W
STATE..... WASHINGTON — B&M: WILLAMETTE
COUNTY..... SKAMANIA
GEOLOGIC PROVINCE.. 39
MAP REFERENCE..... BONNEVILLE DAM 15'

SAMPLE DESCRIPTION AND CONDITIONS

DATE/COLLECTOR..... 1980/08/08
TEMPERATURE (C)..... 36.
DISCHARGE..... L/MIN
OTHER SAMPLE INFORMATION.. SULFIDE AS H2S = 0.5 MG/L

WATER ANALYSIS

PH..... 9.54

CHARGE IMBALANCE (% DIFF)... 6.0

ANALYSIS IN MG/L

								ISOTOPES (0/00)
AL....		CR.....		MG...	0.03			
B.....	2.9	F.....	0.66	NA...	145.	SIO2.	46.	
BE....		FE(TOT).		NB...		SO4..	80.	
CA....	31.	HCO3....	39.					
CL....	180.							
CO....		K.....	0.9					

REFERENCE AND IDENTIFICATION

COMPILED BY..... MARINER, R. H.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... MARINER AND OTHERS, 1982

RECORD 00048

GEOTHERM SAMPLE FILE — GEOTHERM FILE ID: 0001336

NAME OF SAMPLE SOURCE... BONNEVILLE HOT SPRINGS (MOFFETT'S HOT SPRINGS)
WARING NUMBER..... 16

LOCATION — TOWNSHIP-RANGE — COORDINATES

COUNTRY..... UNITED STATES — 02N 007E 16 SW
STATE..... WASHINGTON — B&M: W
COUNTY..... SKAMANIA
GEOLOGIC PROVINCE..
MAP REFERENCE..... BONNEVILLE DAM 1:24000
UTM ZONE... +10
NORTHING... 5056170.
581070.
OTHER LOCALITY INFORMATION: ALONG GREENLEAF CREEK NE OF THE TOWN OF NORTH BONNEVILLE RESORT

SAMPLE DESCRIPTION AND CONDITIONS

DATE/COLLECTOR..... 1979/00/00 KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
SAMPLE NUMBER..... BVA-2
POINT OF COLLECTION.. SPIGOT NEAR WELL HEAD
TEMPERATURE (C)..... 36.2
WELL DEPTH (M)..... E A.
DISCHARGE..... 76. L/MIN
PERTINENT LITHOLOGY..... SITE LOCATED IN AREA OF RECENT LANDSLIDE CONSISTING OF YAKIMA BASALT AND EAGLE CREEK FORMATION (MIOCENE VOLCANIC, CONGLOMERATE, SEDIMENTRY) WHICH OVERLIE ONANAPECOSH FORMATION (EOCENE VOLCANICS).

WATER ANALYSIS

PH..... 8.2
SPECIFIC CONDUCTANCE..... 805.

ANALYSIS IN MG/L

								ISOTOPES (0/00)
AG....		CO3.....		LI...	0.2			
AL....		CR.....		MG...	0.5			
B.....		F.....		NA...	160.	SIO2.	50.	
BE....		FE(TOT).		NB...		SO4..	8.	
BR....	1.2							
CA....	31.							
CL....	196.	I.....	0.01					
CO....		K.....	1.					

REFERENCE AND IDENTIFICATION

COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, M.A., WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES, FOR D.O.E.

RECORD 00049

GEOTHERM SAMPLE FILE — GEOTHERM FILE ID: 0001335

NAME OF SAMPLE SOURCE... BONNEVILLE HOT SPRINGS (MOFFETT'S HOT SPRINGS)
WARING NUMBER..... 16

LOCATION — TOWNSHIP-RANGE — COORDINATES

COUNTRY..... UNITED STATES — 02N 007E 16 SW
STATE..... WASHINGTON — B&M: W — UTM ZONE... +10
COUNTY..... SKAMANIA — NORTHING... 5056170.
GEOLOGIC PROVINCE.. — 581070.
MAP REFERENCE..... BONNEVILLE DAM 1:24000
OTHER LOCALITY INFORMATION: NEAR UNKDERGROUND GAS LINE WHICH CAN BE FOUND 50 METERS NORTH OF WELLS, FOLLOW THE PIPELINE SW UKP THE HILL TO HOT SPRING

SAMPLE DESCRIPTION AND CONDITIONS

DATE/COLLECTOR..... 1979/00/00 KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
SAMPLE NUMBER..... BVB-2
TEMPERATURE (C)..... 29.2
DISCHARGE..... 19. L/MIN
OTHER SAMPLE INFORMATION.. MIXING MAY HAVE OCCURED BETWEEN HOT SPRING AND ADJACENT COLD SPRING

WATER ANALYSIS

SPECIFIC CONDUCTANCE..... 790.
ANALYSIS IN MG/L — ISOTOPES (0/00)

AG....	CO3.....	LI...	0.1		
AL....	CR.....	MG...	0.5		
B.....	F.....	NA...	146.	SIO2.	50.
BE....	FE(TOT).	NB...		SO4..	78.
CA.... 28.					

QUALIFICATION FIELD..... FLOW VARIES FROM 0. TO 10. GPM

REFERENCE AND IDENTIFICATION

COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, M.A., WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES, FOR D.O.E.

RECORD 00050

GEOTHERM SAMPLE FILE — GEOTHERM FILE ID: 0001337

NAME OF SAMPLE SOURCE... COLLINS HOT SPRINGS

LOCATION — TOWNSHIP-RANGE — COORDINATES

COUNTRY..... UNITED STATES — 03N 009E 31 SW
STATE..... WASHINGTON — B&M: W — UTM ZONE... +10
COUNTY..... SKAMANIA — NORTHING... 5061200.
GEOLOGIC PROVINCE.. — 599200.
MAP REFERENCE..... HOOD RIVER 1:62500
OTHER LOCALITY INFORMATION: SITE FLOODED BY BONNEVILLE DAM. SPRING IS REPORTEDLY CAPPED AND VALVED IN A SQUARE STEEL HOUSING WHICH IS 3 FT BY 3 FT AT THE TOP, AND 5FT BY 5 FT AT THE BASE. THE STRUCTURE STANDS IN ABOUT 12 FT OF WATER, ABOUT 30 FT FROM SHORE.

SAMPLE DESCRIPTION AND CONDITIONS

TEMPERATURE (C)..... E 45.
OTHER SAMPLE INFORMATION.. EARLIER REPORTS SEEM TO INDICATE ARTESIAN PRESSURE SUFFICIENT TO CREATE A 6. METER SPOUT THROUGH A RESTRICTED VALVE

QUALIFICATION FIELD..... TEMPERATURE IS THOUGHT TO HAVE BEEN BETWEEN 40. AND 50. C

REFERENCE AND IDENTIFICATION

COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, M.A., WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES, FOR D.O.E.

RECORD 00051

GEOTHERM SAMPLE FILE — GEOTHERM FILE ID: 0000057

NAME OF SAMPLE SOURCE... COLLINS HOT SPRINGS

LOCATION — TOWNSHIP-RANGE — COORDINATES

COUNTRY..... UNITED STATES LAT/LONG... 45-42.1 N 121-43.7 W
STATE..... WASHINGTON
COUNTY..... SKAMANIA
GEOLOGIC PROVINCE.. 39
SAMPLE DESCRIPTION AND CONDITIONS
TEMPERATURE (C)..... 50.
REFERENCE AND IDENTIFICATION
COMPILED BY..... R. MARINER
REFERENCE..... BERRY AND OTHERS, 1980

RECORD 00052

GEOTHERM SAMPLE FILE GEOTHERM FILE ID: 0000061
NAME OF SAMPLE SOURCE... ORR CREEK WARM SPRING
LOCATION TOWNSHIP-RANGE COORDINATES
COUNTRY..... UNITED STATES LAT/LONG... 46-20.7 N 121-36.0 W
STATE..... WASHINGTON
COUNTY..... SKAMANIA
GEOLOGIC PROVINCE.. 39
SAMPLE DESCRIPTION AND CONDITIONS
TEMPERATURE (C)..... 22.
REFERENCE AND IDENTIFICATION
COMPILED BY..... R. MARINER
REFERENCE..... BERRY AND OTHERS, 1980

RECORD 00053

GEOTHERM SAMPLE FILE GEOTHERM FILE ID: 0001338
NAME OF SAMPLE SOURCE... ORR CREEK WARM SPRINGS
LOCATION TOWNSHIP-RANGE COORDINATES
COUNTRY..... UNITED STATES 10N 010E 19 NE LAT/LONG... 46-20.70 N 121-36.00 W
STATE..... WASHINGTON B&M: W
COUNTY..... SKAMANIA
MAP REFERENCE..... GREEN MTN 1:24000
OTHER LOCALITY INFORMATION: FAR WEST SIDE OF CLEAR CUT, ABOUT HALF WAY DOWN CLEARED SLOPE
SAMPLE DESCRIPTION AND CONDITIONS
DATE/COLLECTOR..... 1979/00/00 KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
SAMPLE NUMBER..... OCA-1
TEMPERATURE (C)..... 21.7
DISCHARGE..... 95. L/MIN
WATER ANALYSIS
SPECIFIC CONDUCTANCE..... 175.
ANALYSIS IN MG/L ISOTOPES (0/00)

AG....	CO3.....	LI...	0.01		
AL....	CR.....	MG...	0.1		
B.....	F.....	NA...		SIO2.	29.
BE....	FE(TOT).	NB...		SO4..	1.
CA.... 3.					
CL.... 28.					
CO....	K..... 9.				

QUALIFICATION FIELD,.... RANGE 20. TO 30. GPM
REFERENCE AND IDENTIFICATION
COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... #KOROSEC, M.A., WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES, FOR D.O.E.: BERRY 1980

RECORD 00054

GEOTHERM SAMPLE FILE — GEOTHERM FILE ID: 0000049
NAME OF SAMPLE SOURCE... ROCK CREEK HOT SPRING
LOCATION — TOWNSHIP-RANGE — COORDINATES
COUNTRY..... UNITED STATES — LAT/LONG... 45-43.4 N 121-55.6 W
STATE..... WASHINGTON
COUNTY..... SKAMANIA
GEOLOGIC PROVINCE.. 39
SAMPLE DESCRIPTION AND CONDITIONS
TEMPERATURE (C)..... 7 24.
REFERENCE AND IDENTIFICATION
COMPILED BY..... R. MARINER
REFERENCE..... BERRY AND OTHERS, 1980

RECORD 00055

GEOTHERM SAMPLE FILE — GEOTHERM FILE ID: 0001339
NAME OF SAMPLE SOURCE... ROCK CREEK HOT SPRINGS
LOCATION — TOWNSHIP-RANGE — COORDINATES
COUNTRY..... UNITED STATES — 03N 007E 27 NE
STATE..... WASHINGTON — B&M: W — UTM ZONE... +10
COUNTY..... SKAMANIA — NORTHING... 5063400.
GEOLOGIC PROVINCE.. — 583570.
MAP REFERENCE..... BONNEVILLE DAM 1:24000
SAMPLE DESCRIPTION AND CONDITIONS
DATE/COLLECTOR..... KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
TEMPERATURE (C)..... E 20.
REFERENCE AND IDENTIFICATION
COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, M.A., WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES, FOR D.O.E.

RECORD 00056

GEOTHERM SAMPLE FILE — GEOTHERM FILE ID: 0001340
NAME OF SAMPLE SOURCE... SHIPERD HOT SPRINGS
LOCATION — TOWNSHIP-RANGE — COORDINATES
COUNTRY..... UNITED STATES — 03N 008E 21 SE
STATE..... WASHINGTON — B&M: W — UTM ZONE... +10
COUNTY..... SKAMANIA — NORTHING... 5064535.
GEOLOGIC PROVINCE.. — 593725.
MAP REFERENCE..... CARSON 1:24000
OTHER LOCALITY INFORMATION: ON THE NE SIDE OF THE RIVER
SAMPLE DESCRIPTION AND CONDITIONS
DATE/COLLECTOR..... KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
TEMPERATURE (C)..... R 47.5
QUALIFICATION FIELD..... RANGE IS 45. TO 50. C
REFERENCE AND IDENTIFICATION
COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, M.A., WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES, FOR D.O.E.

RECORD 00057

GEOTHERM SAMPLE FILE — GEOTHERM FILE ID: 0001341

NAME OF SAMPLE SOURCE... ST. MARTIN HOT SPRING

LOCATION — TOWNSHIP-RANGE — COORDINATES

COUNTRY.....	UNITED STATES	03N 008E 21 SE	
STATE.....	WASHINGTON	B&M: W	UTM ZONE... +10
COUNTY.....	SKAMANIA		NORTHING... 5064450.
GEOLOGIC PROVINCE..			593600.
MAP REFERENCE.....	CARSON 1:24000		

SAMPLE DESCRIPTION AND CONDITIONS

DATE/COLLECTOR.....	KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
SAMPLE NUMBER.....	SMA-1
TEMPERATURE (C).....	Q 32.

WATER ANALYSIS

SPECIFIC CONDUCTANCE..... 2350.

ANALYSIS IN MG/L — ISOTOPES (O/OO)

AG....		CO3.....		LI...	0.3		
AL....		CR.....		MG...	0.5		
B.....		F.....		NA...	360.	$102.	57.
BR....	4.5						
CA....	73.						
CL....	756.	I.....	0.02				
CO....		K.....	6.				

QUALIFICATION FIELD..... MAXIMUM TEMPERATURE IS 49. C

REFERENCE AND IDENTIFICATION

COMPILED BY.....	LIEB, RANDY, J.
COMPILER AFFILIATION...	U.S. GEOLOGICAL SURVEY
REFERENCE.....	*KOROSEC, M.A., WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES, FOR D.O.E.

RECORD 00058

GEOTHERM SAMPLE FILE — GEOTHERM FILE ID: 0000039

NAME OF SAMPLE SOURCE... ST. MARTIN'S HOT SPRINGS

LOCATION — TOWNSHIP-RANGE — COORDINATES

COUNTRY.....	UNITED STATES	03N 008E 21 SE	LAT/LONG... 45-43.7 N 121-48.0 W
STATE.....	WASHINGTON	B&M: WILLAMETTE	
COUNTY.....	SKAMANIA		
GEOLOGIC PROVINCE..	39		
MAP REFERENCE.....	BONNEVILLE DAM 15'		

SAMPLE DESCRIPTION AND CONDITIONS

DATE/COLLECTOR.....	1977/07/26
TEMPERATURE (C).....	48.
DISCHARGE.....	L/MIN

WATER ANALYSIS

PH.....	8.54
SPECIFIC CONDUCTANCE.....	2330.
CHARGE IMBALANCE (% DIFF)...	2.6

ANALYSIS IN MG/L — ISOTOPES (O/OO)

AL....		CR.....		MG...	0.3		
B.....	2.9	F.....	0.74	NA...	360.	SIO2.	48.
BE....		FE(TOT).		NB...		SO4..	16.
CA....	76.	HCO3....	19.				
CL....	690.						
CO....		K.....	6.4				

REFERENCE AND IDENTIFICATION
COMPILED BY..... MARINER, R. H.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... MARINER AND OTHERS, 1982

RECORD 00059

GEOTHERM SAMPLE FILE — GEOTHERM FILE ID: 0000755
NAME OF SAMPLE SOURCE... GAMMA HOT SPRING

LOCATION — TOWNSHIP-RANGE — COORDINATES
COUNTRY..... UNITED STATES — LAT/LONG... 48-10.00 N 121-02.00 W
STATE..... WASHINGTON — UTM ZONE... +10
COUNTY..... SNOHOMISH — NORTHING... 5336476.
GEOLOGIC PROVINCE.. — 646233.

SAMPLE DESCRIPTION AND CONDITIONS
TEMPERATURE (C)..... 60.0

WATER ANALYSIS
PH..... 7.9
ANALYSIS — ISOTOPES (O/OO)
B..... F..... NA... 491. SIO2. 150.
CA.... 47.
CO... K..... 77.

REFERENCE AND IDENTIFICATION
COMPILED BY..... RENNER, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... WHITE AND WILLIAMS, 1975; TABOR AND CROWDER, 1969

RECORD 00060

GEOTHERM SAMPLE FILE — GEOTHERM FILE ID: 0001342
NAME OF SAMPLE SOURCE... GAMMA HOT SPRINGS

LOCATION — TOWNSHIP-RANGE — COORDINATES
COUNTRY..... UNITED STATES — 31N 013E 24 SE
STATE..... WASHINGTON — B&M: W — UTM ZONE... +10
COUNTY..... SNOHOMISH — NORTHING... 5334820.
GEOLOGIC PROVINCE.. — 644100.
MAP REFERENCE..... GLACIER PEAK 1:62500

SAMPLE DESCRIPTION AND CONDITIONS
DATE/COLLECTOR..... KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
TEMPERATURE (C)..... E 60.
DISCHARGE..... E 15. L/MIN

WATER ANALYSIS
SPECIFIC CONDUCTANCE..... 2800.

REFERENCE AND IDENTIFICATION
COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, M.A., WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES, FOR D.O.E.

RECORD 00061

GEOTHERM SAMPLE FILE — GEOTHERM FILE ID: 0000769
NAME OF SAMPLE SOURCE... GARLAND HOT SPRINGS (SAN JUAN HOT SPRINGS)

LOCATION — TOWNSHIP-RANGE — COORDINATES
COUNTRY..... UNITED STATES — LAT/LONG... 47-20.50 N 121-53.40 W
STATE..... WASHINGTON — UTM ZONE... +10
COUNTY..... SNOHOMISH — NORTHING... 5243512.

GEOLOGIC PROVINCE.. 583851.
SAMPLE DESCRIPTION AND CONDITIONS
TEMPERATURE (C)..... 21.0
WATER ANALYSIS
PH..... 6.0
ANALYSIS ISOTOPES (0/00)
AG.... CO3..... LI... 7.5
AL.... CR..... MG... 75.
B..... F..... NA... 1592. SIO2. 120.
CA.... 336.
CL.... 2671.
CO.... K..... 130.
REFERENCE AND IDENTIFICATION
COMPILED BY..... RENNER, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... WHITE AND WILLIAMS, 1975; CAMPBELL AND OTHERS, 1970

RECORD 00062

GEOTHERM SAMPLE FILE GEOTHERM FILE ID: 0001343
NAME OF SAMPLE SOURCE... GARLAND MINERAL SPRINGS
LOCATION TOWNSHIP-RANGE COORDINATES
COUNTRY..... UNITED STATES 28N 011E 25 NW
STATE..... WASHINGTON B&M: W UTM ZONE... +10
COUNTY..... SNOHOMISH NORTHING... 5305120.
GEOLOGIC PROVINCE.. 623980.
MAP REFERENCE..... BLANCA LAKE 1:24000
SAMPLE DESCRIPTION AND CONDITIONS
DATE/COLLECTOR..... KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
TEMPERATURE (C)..... E 29.
DISCHARGE..... E 100. L/MIN
REFERENCE AND IDENTIFICATION
COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, M.A., WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES, FOR D.O.E.

RECORD 00063

GEOTHERM SAMPLE FILE GEOTHERM FILE ID: 0000173
NAME OF SAMPLE SOURCE... GARLAND MINERAL SPRINGS
LOCATION TOWNSHIP-RANGE COORDINATES
COUNTRY..... UNITED STATES 28N 011E 25 NE LAT/LONG... 47-53. N 121-21. W
STATE..... WASHINGTON
COUNTY..... SNOHOMISH
GEOLOGIC PROVINCE.. 39
SAMPLE DESCRIPTION AND CONDITIONS
DATE/COLLECTOR..... 1977/07/23 MARINER, R. AND EVANS, W.
SAMPLE NUMBER..... GTS3RM77
TEMPERATURE (C)..... 29.
WATER ANALYSIS
DATE/ANALYST..... 1977/12 BARNES GROUP
PH..... 6.46
SPECIFIC CONDUCTANCE..... 12900.
ALKALINITY..... 2690. AS HCO3
CHARGE IMBALANCE (% DIFF)... 4.0
ANALYSIS IN MG/L ISOTOPES (0/00)

AG....		CO3.....		LI...	9.4			
AL....		CR.....		MG...	87.			
AS....		CS.....	0.2	MN...	0.92			
AU....		CU.....	L 0.01					
B.....	64.	F.....	1.6	NA...	2500.	SIO2.	105.	
BE....		FE(TOT).	5.4	NB...		SO4..	160.	
BR....	7.5	GE.....		NI...	L 0.04			
CA....	390.	HCO3....	2600.					
CA+MG.		HG.....	L 0.0001	PB...	L 0.05			
CD....	0.01	H2S.....	L 1.					
CL....	3600.	I.....	0.8					
CO....	L 0.02	K.....	200.	RB...	0.47	ZN...	0.02	

GAS ANALYSIS

DATE/ANALYST..... 1977/12 BARNES GROUP

ANALYSIS IN VOL %

ISOTOPES (00/01)

AR...	L 0.02		
CH4..	L 0.005		
C2H6.	0.05	N2...	0.25
CO2..	99.30	O2...	0.1
H2...	0.01		
HE...	0.02		

REFERENCE AND IDENTIFICATION

COMPILED BY..... MARINER, R.

COMPILER AFFILIATION... U. S. GEOLOGICAL SURVEY

REFERENCE..... *MARINER, R., USGS, MENLO PARK

RECORD 00064

GEOTHERM SAMPLE FILE GEOTHERM FILE ID: 0000171

NAME OF SAMPLE SOURCE... KENNDEY HOT SPRINGS

LOCATION — TOWNSHIP-RANGE — COORDINATES

COUNTRY..... UNITED STATES 30N 012E 01 NE LAT/LONG... 48-07. N 121-12. W

STATE..... WASHINGTON

COUNTY..... SNOHOMISH

GEOLOGIC PROVINCE.. 39

SAMPLE DESCRIPTION AND CONDITIONS

DATE/COLLECTOR..... 1977/07/22 MARINER, R. AND EVANS, W.

SAMPLE NUMBER..... GT52RM77

TEMPERATURE (C)..... 35.

WATER ANALYSIS

DATE/ANALYST..... 1977/12 BARNES GROUP

PH..... 6.27

SPECIFIC CONDUCTANCE..... 4080.

ALKALINITY..... 1660. AS HCO3

CHARGE IMBALANCE (% DIFF)... 0.1

ANALYSIS IN MG/L

ISOTOPES (0/00)

AG....		CO3.....		LI...	3.5			
AL....		CR.....		MG...	48.			
AS....		CS.....	0.15	MN...	0.4			
AU....		CU.....	L 0.01					
B.....	7.5	F.....	1.2	NA...	670.	SIO2.	175.	
BE....		FE(TOT).	3.0	NB...		SO4..	2.	
BR....	1.8	GE.....		NI...	L 0.02			
CA....	190.	HCO3....	1660.					
CA+MG.		HG.....	0.0015	PB...	L 0.05			
CD....	L 0.005	H2S.....	L 1.					

CL.... 625. I..... L 0.1
CO.... L 0.02 K..... 72. RB... 0.32 ZN... 0.35

GAS ANALYSIS
DATE/ANALYST..... 1977/12 BARNES GROUP
ANALYSIS IN VOL %
ISOTOPES (00/01)
AR... L 0.02
CH4.. 0.13
C2H6. L 0.05 N2... 0.36
CO2.. 99.18 O2... 0.08
H2... L 0.01
HE... L 0.02

REFERENCE AND IDENTIFICATION
COMPILED BY..... MARINER, R.
COMPILER AFFILIATION... U. S. GEOLOGICAL SURVEY
REFERENCE..... *MARINER, R., USGS, MENLO PARK

RECORD 00065

GEOTHERM SAMPLE FILE GEOTHERM FILE ID: 0000757
NAME OF SAMPLE SOURCE... KENNEDY
LOCATION TOWNSHIP-RANGE COORDINATES
COUNTRY..... UNITED STATES LAT/LONG... 48-07.10 N 121-11.70 W
STATE..... WASHINGTON UTM ZONE... +10
COUNTY..... SNOHOMISH NORTHING... 5330809.
GEOLOGIC PROVINCE.. 634339.
SAMPLE DESCRIPTION AND CONDITIONS
TEMPERATURE (C)..... 30.0
WATER ANALYSIS
PH..... 7.7
ANALYSIS ISOTOPES (0/00)
AG.... CO3..... LI... 3.7
AL.... CR..... MG... 60.
B..... F..... NA... 655. SIO2. 136.
CA.... 37.
CO.... K..... 64.

REFERENCE AND IDENTIFICATION
COMPILED BY..... RENNER, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... WHITE AND WILLIAMS, 1975; TABOR AND CROWDER, 1969

RECORD 00066

GEOTHERM SAMPLE FILE GEOTHERM FILE ID: 0001344
NAME OF SAMPLE SOURCE... KENNEDY HOT SPRINGS
LOCATION TOWNSHIP-RANGE COORDINATES
COUNTRY..... UNITED STATES 30N 012E 01 NE
STATE..... WASHINGTON B&M: W UTM ZONE... +10
COUNTY..... SNOHOMISH NORTHING... 5330850.
GEOLOGIC PROVINCE.. 634440.
MAP REFERENCE..... GLACIER PEAK 1:62500
SAMPLE DESCRIPTION AND CONDITIONS
DATE/COLLECTOR..... KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
TEMPERATURE (C)..... E 38.
DISCHARGE..... E 60. L/MIN
WATER ANALYSIS
SPECIFIC CONDUCTANCE..... 3400.

REFERENCE AND IDENTIFICATION
COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, M.A., WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES, FOR D.O.E.

RECORD 00067

GEOTHERM SAMPLE FILE GEOTHERM FILE ID: 0001345
NAME OF SAMPLE SOURCE... SULPHUR CREEK HOT SPRING
LOCATION TOWNSHIP-RANGE COORDINATES
COUNTRY..... UNITED STATES 32N 013E 19 NE
STATE..... WASHINGTON B&M: W UTM ZONE... +10
COUNTY..... SNOHOMISH NORTHING... 5346000.
GEOLOGIC PROVINCE.. 635075.
MAP REFERENCE..... DOWNEY MTN 1:24000
SAMPLE DESCRIPTION AND CONDITIONS
DATE/COLLECTOR..... KOROSEC, M.A. WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
TEMPERATURE (C)..... E 37.
DISCHARGE..... E 10. L/MIN
OTHER SAMPLE INFORMATION.. FLOWING FROM BEDROCK FRACTURES
WATER ANALYSIS
SPECIFIC CONDUCTANCE..... 500.
REFERENCE AND IDENTIFICATION
COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, M.A., WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES, FOR D.O.E.

RECORD 00068

GEOTHERM SAMPLE FILE GEOTHERM FILE ID: 0000767
NAME OF SAMPLE SOURCE... SULPHUR CREEK HOT SPRINGS
LOCATION TOWNSHIP-RANGE COORDINATES
COUNTRY..... UNITED STATES LAT/LONG... 48-15.30 N 121-10.80 W
STATE..... WASHINGTON UTM ZONE... +10
COUNTY..... SNOHOMISH NORTHING... 5346025.
GEOLOGIC PROVINCE.. 635095.
SAMPLE DESCRIPTION AND CONDITIONS
TEMPERATURE (C)..... 30.0
WATER ANALYSIS
PH..... 7.8
ANALYSIS ISOTOPES (O/OOO)
B..... F..... NA... 103. SIO2. 75.
CA.... 1.0
CO.... K..... 1.7
REFERENCE AND IDENTIFICATION
COMPILED BY..... RENNER, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... WHITE AND WILLIAMS, 1975; TABOR AND CROWDER, 1969

RECORD 00069

GEOTHERM SAMPLE FILE GEOTHERM FILE ID: 0000170
NAME OF SAMPLE SOURCE... SULPHUR HOT SPRING
LOCATION TOWNSHIP-RANGE COORDINATES
COUNTRY..... UNITED STATES LAT/LONG... 48-15.5 N 121-10.5 W
STATE..... WASHINGTON

COUNTY..... SNOHOMISH
GEOLOGIC PROVINCE.. 39

SAMPLE DESCRIPTION AND CONDITIONS
DATE/COLLECTOR..... 1977/07/22 MARINER, R. AND EVANS, W.
SAMPLE NUMBER..... GT51RM77
TEMPERATURE (C)..... 37.

WATER ANALYSIS
DATE/ANALYST..... 1977/12 BARNES GROUP
PH..... 9.35
SPECIFIC CONDUCTANCE..... 509.
ALKALINITY..... 154. AS HCO3
CHARGE BALANCE (% DIFF)... 2.2
ANALYSIS IN MG/L

								ISOTOPES (O/OO)
AG....		CO3.....		LI...	0.14			
AL....		CR.....		MG...	L 0.05			
AS....		CS.....	L 0.1	MN...	L 0.01			
AU....		CU.....	L 0.01					
B.....	0.55	F.....	3.9	NA...	100.	SIO2.	76.	
BE....		FE(TOT).	L 0.02	NB...		SO4..	21.	
BI....		GA.....		NH4..	0.48			
BR....		GE.....		NI...	L 0.02			
CA....	1.2	HCO3....	154.					
CA+MG.		HG.....	0.0004	PB...	L 0.05			
CD....	L 0.005	H2S.....	15.					
CL....	51.							
CO....	L 0.02	K.....	1.9	RB...	L 0.02	ZN...	0.005	

GAS ANALYSIS
DATE/ANALYST..... 1977/12 BARNES GROUP
ANALYSIS IN VOL %

				ISOTOPES (O/OO)
AR...	1.3			
CH4..	0.28			
C2H6.	L 0.05	N2...	96.67	
CO2..	L 0.01	O2...	L 0.02	
H2...	L 0.01			
HE...	0.03			

REFERENCE AND IDENTIFICATION
COMPILED BY..... MARINER, R.
COMPILER AFFILIATION... U. S. GEOLOGICAL SURVEY
REFERENCE..... *MARINER, R., USGS, MENLO PARK

RECORD 00070

GEOTHERM SAMPLE FILE GEOTHERM FILE ID: 0000058
NAME OF SAMPLE SOURCE... WARM SPRINGS CANYON
LOCATION TOWNSHIP-RANGE COORDINATES
COUNTRY..... UNITED STATES LAT/LONG... 46-01.4 N 118 46.3 W
STATE..... WASHINGTON
COUNTY..... WALLA WALLA
GEOLOGIC PROVINCE.. 40

SAMPLE DESCRIPTION AND CONDITIONS
TEMPERATURE (C)..... 22.

REFERENCE AND IDENTIFICATION
COMPILED BY..... R. MARINER
REFERENCE..... BERRY AND OTHERS, 1980

RECORD 00071

GEOTHERM SAMPLE FILE — GEOTHERM FILE ID: 0001346

NAME OF SAMPLE SOURCE... WARM SPRINGS CANYON WARM SPRING

LOCATION — TOWNSHIP-RANGE — COORDINATES

COUNTRY.....	UNITED STATES	06N 032E 02 SE	
STATE.....	WASHINGTON	B&M: W	UTM ZONE... +10
COUNTY.....	WALLA WALLA		NORTHING... 5098000.
GEOLOGIC PROVINCE..			362950.
MAP REFERENCE.....	ZANGAR JUNCTION 1:24000.		

SAMPLE DESCRIPTION AND CONDITIONS

DATE/COLLECTOR..... KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES

TEMPERATURE (C)..... E 22.

REFERENCE AND IDENTIFICATION

COMPILED BY..... LIEB, RANDY, J.

COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY

REFERENCE..... *KOROSEC, M.A., WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES, FOR D.O.E.

RECORD 00072

GEOTHERM SAMPLE FILE — GEOTHERM FILE ID: 0000753

NAME OF SAMPLE SOURCE... BAKER HOT SPRING

LOCATION — TOWNSHIP-RANGE — COORDINATES

COUNTRY.....	UNITED STATES		LAT/LONG... 48-45.90 N 121-40.20 W
STATE.....	WASHINGTON		UTM ZONE... +10
COUNTY.....	WHATCOM		NORTHING... 5401967.
GEOLOGIC PROVINCE..			597738.

SAMPLE DESCRIPTION AND CONDITIONS

TEMPERATURE (C)..... 42.0

WATER ANALYSIS

PH..... 8.0

ANALYSIS — ISOTOPES (0/00)

AG....		CO3....		LI...	0.4		
B.....		F.....		NA...	165.	SIO2.	140.
CA....	7.9						
CL....	108.						
CO....		K.....	10.				

REFERENCE AND IDENTIFICATION

COMPILED BY..... RENNER, J.

COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY

REFERENCE..... WHITE AND WILLIAMS, 1975; CAMPBELL AND OTHERS, 1979

RECORD 00073

GEOTHERM SAMPLE FILE — GEOTHERM FILE ID: 0001300

NAME OF SAMPLE SOURCE... BAKER HOT SPRINGS (MOROVITZ HOT SPRINGS)

WARING NUMBER..... 01.

LOCATION — TOWNSHIP-RANGE — COORDINATES

COUNTRY.....	UNITED STATES	38N 009E 20 SW	
STATE.....	WASHINGTON	B&M: W	UTM ZONE... +10
COUNTY.....	WHATCOM		NORTHING... 5401740.
GEOLOGIC PROVINCE..			597760.
MAP REFERENCE.....	MTSHUKSAN 1:62500		

OTHER LOCALITY INFORMATION: LOCATED ON A HILLSIDE IN THE SWIFT CREEK VALLEY NEAR MOROVITZ CREEK

SAMPLE DESCRIPTION AND CONDITIONS

DATE/COLLECTOR..... KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
POINT OF COLLECTION.. POOL
TEMPERATURE (C)..... 42.
DISCHARGE..... 38. L/MIN
REFERENCE AND IDENTIFICATION
COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, M.A., WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES, FOR D.O.E.

RECORD 00074

GEOTHERM SAMPLE FILE GEOTHERM FILE ID: 0001301
NAME OF SAMPLE SOURCE... DORR FUMAROLE FIELD
LOCATION TOWNSHIP-RANGE COORDINATES
COUNTRY..... UNITED STATES 38N 008E 17 NW OF NW LAT/LONG... 48-47.34 N 121-48.24 W
STATE..... WASHINGTON B&M: W
COUNTY..... WHATCOM
MAP REFERENCE..... MT BAKER 1:62500
OTHER LOCALITY INFORMATION: LOCATION VAGUE
SAMPLE DESCRIPTION AND CONDITIONS
DATE/COLLECTOR..... KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
TEMPERATURE (C)..... 90.
REFERENCE AND IDENTIFICATION
COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES; BERRY AND OTHERS, 1980

RECORD 00075

GEOTHERM SAMPLE FILE GEOTHERM FILE ID: 0001302
NAME OF SAMPLE SOURCE... SHERMAN CRATER FUMAROLES
LOCATION TOWNSHIP-RANGE COORDINATES
COUNTRY..... UNITED STATES 38N 008E 19 SW OF NE LAT/LONG... 48-48.20 N 121-48.78 W
STATE..... WASHINGTON B&M: W
COUNTY..... WHATCOM
OTHER LOCALITY INFORMATION: LOCATION APPROXIMATE
SAMPLE DESCRIPTION AND CONDITIONS
DATE/COLLECTOR..... KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
TEMPERATURE (C)..... R 110.
QUALIFICATION FIELD..... RANGE 90 C TO 130 C
REFERENCE AND IDENTIFICATION
COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES; BERRY AND OTHERS, 1980

RECORD 00076

GEOTHERM SAMPLE FILE GEOTHERM FILE ID: 0001347
NAME OF SAMPLE SOURCE... MT. ADAMS FUMAROLES
LOCATION TOWNSHIP-RANGE COORDINATES
COUNTRY..... UNITED STATES 08N 010E 01 LAT/LONG... 46-12.12 N 121-29.52 W
STATE..... WASHINGTON B&M: W
COUNTY..... YAKIMA
MAP REFERENCE..... MT ADAMS EAST 1:24000
OTHER LOCALITY INFORMATION: LOCATION VAGUE
SAMPLE DESCRIPTION AND CONDITIONS

DATE/COLLECTOR..... KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
TEMPERATURE (C)..... E 50.
REFERENCE AND IDENTIFICATION
COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES; BERRY AND OTHERS, 1980

RECORD 00077

GEOTHERM SAMPLE FILE GEOTHERM FILE ID: 0000059
NAME OF SAMPLE SOURCE... SIMCOE SODA SPRING
LOCATION TOWNSHIP-RANGE COORDINATES
COUNTRY..... UNITED STATES LAT/LONG... 46-27.1 N 120-57.4 W
STATE..... WASHINGTON
COUNTY..... YAKIMA
GEOLOGIC PROVINCE.. 39
SAMPLE DESCRIPTION AND CONDITIONS
TEMPERATURE (C)..... 32.
REFERENCE AND IDENTIFICATION
COMPILED BY..... R. MARINER
REFERENCE..... BERRY AND OTHERS, 1980

RECORD 00078

GEOTHERM SAMPLE FILE GEOTHERM FILE ID: 0001348
NAME OF SAMPLE SOURCE... SIMCOE SODA SPRINGS
WARING NUMBER..... 12.
LOCATION TOWNSHIP-RANGE COORDINATES
COUNTRY..... UNITED STATES 11N 015E 09 SW
STATE..... WASHINGTON B&M: W UTM ZONE... +10
COUNTY..... YAKIMA NORTHING... 5146040.
GEOLOGIC PROVINCE.. 656850.
MAP REFERENCE..... YESMOWIT CANYON 1:24000.
SAMPLE DESCRIPTION AND CONDITIONS
DATE/COLLECTOR..... KOROSEC, M.A, WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
TEMPERATURE (C)..... E 20.
REFERENCE AND IDENTIFICATION
COMPILED BY..... LIEB, RANDY, J.
COMPILER AFFILIATION... U.S. GEOLOGICAL SURVEY
REFERENCE..... *KOROSEC, M.A., WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES, FOR D.O.E.

APPENDIX A

Index to GEOTHERM'S sample file for the state of Washington. This computer generated appendix contains some trucated fields. The index is sorted by county and name of the source. TNS - township, RNG range, Sect. - section, I.D. - GEOTHERM record identifier, Temp. - temperature °C (see Table 1 for explanation of alphabetic qualifiers preceeding temperature.)

County	Name of Source	Latitude	Longitude	TNS	RNG	Sect.	I.D.	Temp.
CLALLAM	OLYMPIC HOT SPRING			29N	008E	28	0001303	48.
CLALLAM	OLYMPIC HOT SPRINGS	47-58.90 N	123-41.20 W				0000765	47.0
CLALLAM	OLYMPIC HOT SPRINGS	47-58.6 N	123-40.9 W				0000041	48.5
CLALLAM	SOL DUC HOT SPRING	47-58.10 N	123-52.10 W				0000763	50.0
CLALLAM	SOL DUC HOT SPRINGS			29N	009E	32	0001304	40.0
CLALLAM	SOL DUC HOT SPRINGS	47-58.1 N	123-51.8 W	29N	009W	32	0000040	51.
CLALLAM	SOL DUC HOT SPRINGS			29N	009W	32	0001305	34.
CLALLAM	SOL DUC HOT SPRINGS			29N	009W	32	0001307	46.
CLALLAM	SOL DUC HOT SPRINGS			29N	009W	32	0001306	50.
COWLITZ	GREEN RIVER SODA SPRINGS			10N	004E	02	0001308	R 27.5
GRAYS HARBOR	NEWSKAH MINERAL SPRINGS	46-50. N	123-48. W	16N	009W	09	0001309	17.5
GRAYS HARBOR	NEWSKAH MINERAL SPRINGS	46-50. N	123-48. W	16N	009W	09	0001317	19.0
KING	GOLDMEYER HOT SPRINGS	47-29.0 N	121-23.1 W	23N	011E	15	0000046	50.
KING	GOLDMEYER HOT SPRINGS			23N	011E	14	0001310	E 53.
KING	LESTER HOT SPRINGS			20N	010E	21	0001313	45.
KING	LESTER HOT SPRINGS			20N	010E	21	0001312	45.
KING	LESTER HOT SPRINGS			20N	010E	21	0001311	48.4
KING	LESTER HOT SPRINGS	47-12.5 N	121-32.2 W	20N	010E	21	0000042	46.5
KING	SCENIC HOT SPRINGS	47-42.4 N	121-08.5 W	26N	013E	33	0000043	47.
KING	SCENIC HOT SPRINGS	47-42.42 N	121-09.30 W	26N	013E	32	0001314	50.
KLICKITAT	FISH HATCH WARM SPRING			06N	013E	04	0001315	24.
KLICKITAT	FISH HATCHERY WARM SPRING	46-02.5 N	121-10.9 W				0000074	24.
KLICKITAT	KLICKITAT MINERAL SPRING	45-49.3 N	121-08.0 W				0000048	27.
KLICKITAT	KLICKITAT MINERAL SPRING	45-49.26 N	121-07.98 W	04N	013E	23,	0001316	E 27.
LEWIS	OHANAPECOSH HOT SPRINGS	46-44.20 N	121-33.60 W				0000771	40.0
LEWIS	OHANAPECOSH HOT SPRINGS	46-44.20 N	121-33.60 W	14N	010E	04	0001318	39.5
LEWIS	OHANAPECOSH HOT SPRINGS	46-44.20 N	121-33.60 W	14N	010E	04	0001320	43.6
LEWIS	OHANAPECOSH HOT SPRINGS	46-44.20 N	121-33.60 W	14N	010E	04	0001319	45.6
LEWIS	OHANAPECOSH HOT SPRINGS	46-44.20 N	121-33.60 W	14N	010E	04	0001323	30.6
LEWIS	OHANAPECOSH HOT SPRINGS	46-44.20 N	121-33.60 W	14N	010E	04	0001322	47.8
LEWIS	OHANAPECOSH HOT SPRINGS	46-44.20 N	121-33.60 W	14N	010E	04	0001321	50.1
LEWIS	PACKWOOD HOT SPRING	46-34.50 N	121-42.36 W	13N	009E	32	0001324	E 38.
LEWIS	PACKWOOD HOT SPRING	46-34.5 N	121-42.4 W				0000060	38.
LEWIS	SUMMIT CREEK MINERAL SPRINGS (SODA SPRINGS)	46-42.20 N	121-29.00 W		007E		0000761	13.0
OKANOGAN	HOT LAKE	48-58.44 N	119-28.50 W	40N	027E	18	0001325	R 45.
OKANOGAN	POISON LAKE	48-54.36 N	119-27.30 W	39N	027E	05	0001326	R 45.
PIERCE	LONGMIRE	46-45.10 N	121-48.70 W				0000759	21.0
PIERCE	LONGMIRE MINERAL SPRING	46-45. N	121-45.5 W				0000172	19.
PIERCE	LONGMIRE MINERAL SPRINGS			15N	008E	29	0001333	22.0
PIERCE	LONGMIRE MINERAL SPRINGS			15N	008E	29	0001332	19.1
PIERCE	LONGMIRE MINERAL SPRINGS			15N	008E	29	0001331	11.0
PIERCE	LONGMIRE MINERAL SPRINGS			15N	008E	29	0001330	11.2
PIERCE	LONGMIRE MINERAL SPRINGS			15N	008E	29	0001329	25.1
PIERCE	LONGMIRE MINERAL SPRINGS			15N	008E	29	0001328	13.3
PIERCE	LONGMIRE MINERAL SPRINGS			15N	008E	29	0001327	22.

PIERCE	MT. RAINIER FUMAROLES	46-51.12	N	121-45.48	W	16N 008E	23	0001334	R 62.
SKAMANIA	BONNEVILLE HOT SPRINGS	45-39.4	N	121-57.5	W	02N 007E	39	0000047	36.
SKAMANIA	BONNEVILLE HOT SPRINGS (MOFFETT'S HOT SPRINGS)					02N 007E	16	0001336	36.2
SKAMANIA	BONNEVILLE HOT SPRINGS (MOFFETT'S HOT SPRINGS)					02N 007E	16	0001335	29.2
SKAMANIA	COLLINS HOT SPRINGS					03N 009E	31	0001337	E 45.
SKAMANIA	COLLINS HOT SPRINGS	45-42.1	N	121-43.7	W			0000057	50.
SKAMANIA	ORR CREEK WARM SPRING	46-20.7	N	121-36.0	W			0000061	22.
SKAMANIA	ORR CREEK WARM SPRINGS	46-20.70	N	121-36.00	W	10N 010E	19	0001338	21.7
SKAMANIA	ROCK CREEK HOT SPRING	45-43.4	N	121-55.6	W			0000049	? 24.
SKAMANIA	ROCK CREEK HOT SPRINGS					03N 007E	27	0001339	E 20.
SKAMANIA	SHIPERD HOT SPRINGS					03N 008E	21	0001340	R 47.5
SKAMANIA	ST. MARTIN HOT SPRING					03N 008E	21	0001341	Q 32.
SKAMANIA	ST. MARTIN'S HOT SPRINGS	45-43.7	N	121-48.0	W	03N 008E	21	0000039	48.
SNOHOMISH	GAMMA HOT SPRING	48-10.00	N	121-02.00	W			0000755	60.0
SNOHOMISH	GAMMA HOT SPRINGS					31N 013E	24	0001342	E 60.
SNOHOMISH	GARLAND HOT SPRINGS (SAN JUAN HOT SPRINGS)	47-20.50	N	121-53.40	W			0000769	21.0
SNOHOMISH	GARLAND MINERAL SPRINGS					28N 011E	25	0001343	E 29.
SNOHOMISH	GARLAND MINERAL SPRINGS	47-53.	N	121-21.	W	28N 011E	25	0000173	29.
SNOHOMISH	KENNDEY HOT SPRINGS	48-07.	N	121-12.	W	30N 012E	01	0000171	35.
SNOHOMISH	KENNEDY	48-07.10	N	121-11.70	W			0000757	30.0
SNOHOMISH	KENNEDY HOT SPRINGS					30N 012E	01	0001344	E 38.
SNOHOMISH	SULPHUR CREEK HOT SPRING					32N 013E	19	0001345	E 37.
SNOHOMISH	SULPHUR CREEK HOT SPRINGS	48-15.30	N	121-10.80	W			0000767	30.0
SNOHOMISH	SULPHUR HOT SPRING	48-15.5	N	121-10.5	W			0000170	37.
WALLA WALLA	WARM SPRINGS CANYON	46-01.4	N	118 46.3	W			0000058	22.
WALLA WALLA	WARM SPRINGS CANYON WARM SPRING					06N 032E	02	0001346	E 22.
WHATCOM	BAKER HOT SPRING	48-45.90	N	121-40.20	W			0000753	42.0
WHATCOM	BAKER HOT SPRINGS (MOROVITZ HOT SPRINGS)					38N 009E	20	0001300	42.
WHATCOM	DORR FUMAROLE FIELD	48-47.34	N	121-48.24	W	38N 008E	17	0001301	90.
WHATCOM	SHERMAN CRATER FUMAROLES	48-48.20	N	121-48.78	W	38N 008E	19	0001302	R 110.
YAKIMA	MT. ADAMS FUMAROLES	46-12.12	N	121-29.52	W	08N 010E	01	0001347	E 50.
YAKIMA	SIMCOE SODA SPRING	46-27.1	N	120-57.4	W			0000059	32.
YAKIMA	SIMCOE SODA SPRINGS					11N 015E	09	0001348	E 20.

APPENDIX B

Index to GEOTHERM sample file for the state of Washington sorted by county, township (TNS), range (RNG), and section (Sect.) Also given are the name of source, GEOTHERM record identifier (I.D.), and temperature (Temp. ^{o}C). See Table 1 for explanation of alphabetic qualifiers proceeding temperature.

County	TNS	RNG	Sect.	Name of Source	I.D.	Temp.
CLALLAM				OLYMPIC HOT SPRINGS	0000765	47.0
CLALLAM				SOL DUC HOT SPRING	0000763	50.0
CLALLAM				OLYMPIC HOT SPRINGS	0000041	48.5
CLALLAM	29N	008E	28	OLYMPIC HOT SPRING	0001303	48.
CLALLAM	29N	009E	32	SOL DUC HOT SPRINGS	0001304	40.0
CLALLAM	29N	009W	32	SOL DUC HOT SPRINGS	0000040	51.
CLALLAM	29N	009W	32	SOL DUC HOT SPRINGS	0001305	34.
CLALLAM	29N	009W	32	SOL DUC HOT SPRINGS	0001307	46.
CLALLAM	29N	009W	32	SOL DUC HOT SPRINGS	0001306	50.
COWLITZ	10N	004E	02	GREEN RIVER SODA SPRINGS	0001308	R 27.5
GRAYS HARBOR	16N	009W	09	NEWSKAH MINERAL SPRINGS	0001309	17.5
GRAYS HARBOR	16N	009W	09	NEWSKAH MINERAL SPRINGS	0001317	19.0
KING	20N	010E	21	LESTER HOT SPRINGS	0000042	46.5
KING	20N	010E	21	LESTER HOT SPRINGS	0001313	45.
KING	20N	010E	21	LESTER HOT SPRINGS	0001312	45.
KING	20N	010E	21	LESTER HOT SPRINGS	0001311	48.4
KING	23N	011E	14	GOLDMEYER HOT SPRINGS	0001310	E 53.
KING	23N	011E	15	GOLDMEYER HOT SPRINGS	0000046	50.
KING	26N	013E	32	SCENIC HOT SPRINGS	0001314	50.
KING	26N	013E	33	SCENIC HOT SPRINGS	0000043	47.
KLICKITAT				FISH HATCHERY WARM SPRING	0000074	24.
KLICKITAT				KLICKITAT MINERAL SPRING	0000048	27.
KLICKITAT	04N	013E	23,	KLICKITAT MINERAL SPRING	0001316	E 27.
KLICKITAT	06N	013E	04	FISH HATCH WARM SPRING	0001315	24.
LEWIS				OHANAPECOSH HOT SPRINGS	0000771	40.0
LEWIS				PACKWOOD HOT SPRING	0000060	38.
LEWIS	?	007E		SUMMIT CREEK MINERAL SPRINGS (SODA SPRINGS)	0000761	13.0
LEWIS	13N	009E	32	PACKWOOD HOT SPRING	0001324	E 38.
LEWIS	14N	010E	04	OHANAPECOSH HOT SPRINGS	0001323	30.6
LEWIS	14N	010E	04	OHANAPECOSH HOT SPRINGS	0001322	47.8
LEWIS	14N	010E	04	OHANAPECOSH HOT SPRINGS	0001321	50.1
LEWIS	14N	010E	04	OHANAPECOSH HOT SPRINGS	0001318	39.5
LEWIS	14N	010E	04	OHANAPECOSH HOT SPRINGS	0001320	43.6
LEWIS	14N	010E	04	OHANAPECOSH HOT SPRINGS	0001319	45.6
OKANOGAN	39N	027E	05	POISON LAKE	0001326	R 45.
OKANOGAN	40N	027E	18	HOT LAKE	0001325	R 45.
PIERCE				LONGMIRE	0000759	21.0
PIERCE				LONGMIRE MINERAL SPRING	0000172	19.
PIERCE	15N	008E	29	LONGMIRE MINERAL SPRINGS	0001333	22.0
PIERCE	15N	008E	29	LONGMIRE MINERAL SPRINGS	0001332	19.1
PIERCE	15N	008E	29	LONGMIRE MINERAL SPRINGS	0001331	11.0
PIERCE	15N	008E	29	LONGMIRE MINERAL SPRINGS	0001330	11.2
PIERCE	15N	008E	29	LONGMIRE MINERAL SPRINGS	0001329	25.1
PIERCE	15N	008E	29	LONGMIRE MINERAL SPRINGS	0001328	13.3
PIERCE	15N	008E	29	LONGMIRE MINERAL SPRINGS	0001327	22.

PIERCE	16N	008E	23	MT. RAINIER FUMAROLES	0001334	R	62.
SKAMANIA				ORR CREEK WARM SPRING	0000061		22.
SKAMANIA				COLLINS HOT SPRINGS	0000057		50.
SKAMANIA				ROCK CREEK HOT SPRING	0000049	?	24.
SKAMANIA	02N	007E	16	BONNEVILLE HOT SPRINGS (MOFFETT'S HOT SPRINGS)	0001336		36.2
SKAMANIA	02N	007E	16	BONNEVILLE HOT SPRINGS (MOFFETT'S HOT SPRINGS)	0001335		29.2
SKAMANIA	02N	007E	39	BONNEVILLE HOT SPRINGS	0000047		36.
SKAMANIA	03N	007E	27	ROCK CREEK HOT SPRINGS	0001339	E	20.
SKAMANIA	03N	008E	21	ST. MARTIN HOT SPRING	0001341	Q	32.
SKAMANIA	03N	008E	21	SHIPERD HOT SPRINGS	0001340	R	47.5
SKAMANIA	03N	008E	21	ST. MARTIN'S HOT SPRINGS	0000039		48.
SKAMANIA	03N	009E	31	COLLINS HOT SPRINGS	0001337	E	45.
SKAMANIA	10N	010E	19	ORR CREEK WARM SPRINGS	0001338		21.7
SNOHOMISH				SULPHUR HOT SPRING	0000170		37.
SNOHOMISH				KENNEDY	0000757		30.0
SNOHOMISH				GAMMA HOT SPRING	0000755		60.0
SNOHOMISH				GARLAND HOT SPRINGS (SAN JUAN HOT SPRINGS)	0000769		21.0
SNOHOMISH				SULPHUR CREEK HOT SPRINGS	0000767		30.0
SNOHOMISH	28N	011E	25	GARLAND MINERAL SPRINGS	0000173		29.
SNOHOMISH	28N	011E	25	GARLAND MINERAL SPRINGS	0001343	E	29.
SNOHOMISH	30N	012E	01	KENNDEY HOT SPRINGS	0000171		35.
SNOHOMISH	30N	012E	01	KENNEDY HOT SPRINGS	0001344	E	38.
SNOHOMISH	31N	013E	24	GAMMA HOT SPRINGS	0001342	E	60.
SNOHOMISH	32N	013E	19	SULPHUR CREEK HOT SPRING	0001345	E	37.
WALLA WALLA				WARM SPRINGS CANYON	0000058		22.
WALLA WALLA	06N	032E	02	WARM SPRINGS CANYON WARM SPRING	0001346	E	22.
WHATCOM				BAKER HOT SPRING	0000753		42.0
WHATCOM	38N	008E	17	DORR FUMAROLE FIELD	0001301		90.
WHATCOM	38N	008E	19	SHERMAN CRATER FUMAROLES	0001302	R	110.
WHATCOM	38N	009E	20	BAKER HOT SPRINGS (MOROVITZ HOT SPRINGS)	0001300		42.
YAKIMA				SIMCOE SODA SPRING	0000059		32.
YAKIMA	08N	010E	01	MT. ADAMS FUMAROLES	0001347	E	50.
YAKIMA	11N	015E	09	SIMCOE SODA SPRINGS	0001348	E	20.

APPENDIX C

Index to GEOTHERM sample file for the state of Washington sorted into one-degree blocks by latitude and longitude. Records are sorted by name of source within each one-degree block. Adjacent one-degree blocks which are published as a 1:250,000 map are combined under the appropriate map name. See Table 1 for explanation of alphabetic qualifiers proceeding temperature. I.D. - GEOTHERM record identifier. Temp. - Temperature °C.

Latitude	Longitude	Name of Source	County	I.D.	Temp.
COORDINATES NOT GIVEN					
		BAKER HOT SPRINGS (MOROVITZ HOT SPRINGS)	WHATCOM	0001300	42.
		BONNEVILLE HOT SPRINGS (MOFFETT'S HOT SPRINGS)	SKAMANIA	0001336	36.2
		BONNEVILLE HOT SPRINGS (MOFFETT'S HOT SPRINGS)	SKAMANIA	0001335	29.2
		COLLINS HOT SPRINGS	SKAMANIA	0001337	E 45.
		FISH HATCH WARM SPRING	KLICKITAT	0001315	24.
		GAMMA HOT SPRINGS	SNOHOMISH	0001342	E 60.
		GARLAND MINERAL SPRINGS	SNOHOMISH	0001343	E 29.
		GOLDMEYER HOT SPRINGS	KING	0001310	E 53.
		GREEN RIVER SODA SPRINGS	COWLITZ	0001308	R 27.5
		KENNEDY HOT SPRINGS	SNOHOMISH	0001344	E 38.
		LESTER HOT SPRINGS	KING	0001313	45.
		LESTER HOT SPRINGS	KING	0001312	45.
		LESTER HOT SPRINGS	KING	0001311	48.4
		LONGMIRE MINERAL SPRINGS	PIERCE	0001333	22.0
		LONGMIRE MINERAL SPRINGS	PIERCE	0001332	19.1
		LONGMIRE MINERAL SPRINGS	PIERCE	0001331	11.0
		LONGMIRE MINERAL SPRINGS	PIERCE	0001330	11.2
		LONGMIRE MINERAL SPRINGS	PIERCE	0001329	25.1
		LONGMIRE MINERAL SPRINGS	PIERCE	0001328	13.3
		LONGMIRE MINERAL SPRINGS	PIERCE	0001327	22.
		OLYMPIC HOT SPRING	CLALLAM	0001303	48.
		ROCK CREEK HOT SPRINGS	SKAMANIA	0001339	E 20.
		SHIPERD HOT SPRINGS	SKAMANIA	0001340	R 47.5
		SIMCOE SODA SPRINGS	YAKIMA	0001348	E 20.
		SOL DUC HOT SPRINGS	CLALLAM	0001304	40.0
		SOL DUC HOT SPRINGS	CLALLAM	0001307	46.
		SOL DUC HOT SPRINGS	CLALLAM	0001306	50.
		SOL DUC HOT SPRINGS	CLALLAM	0001305	34.
		ST. MARTIN HOT SPRING	SKAMANIA	0001341	Q 32.
		SULPHUR CREEK HOT SPRING	SNOHOMISH	0001345	E 37.
		WARM SPRINGS CANYON WARM SPRING	WALLA WALLA	0001346	E 22.
THE DALLES 1:250,000					
45-39.4	N 121-57.5 W	BONNEVILLE HOT SPRINGS	SKAMANIA	0000047	36.
45-42.1	N 121-43.7 W	COLLINS HOT SPRINGS	SKAMANIA	0000057	50.
45-49.26	N 121-07.98 W	KLICKITAT MINERAL SPRING	KLICKITAT	0001316	E 27.
45-49.3	N 121-08.0 W	KLICKITAT MINERAL SPRING	KLICKITAT	0000048	27.
45-43.4	N 121-55.6 W	ROCK CREEK HOT SPRING	SKAMANIA	0000049	? 24.

WALLA WALLA 1:250,000

46-01.4 N 118 46.3 W WARM SPRINGS CANYON	WALLA WALLA	0000058	22.

YAKIMA 1:250,000

46-27.1 N 120-57.4 W SIMCOE SODA SPRING	YAKIMA	0000059	32.
46-02.5 N 121-10.9 W FISH HATCHERY WARM SPRING	KLICKITAT	0000074	24.
46-45.10 N 121-48.70 W LONGMIRE	PIERCE	0000759	21.0
46-45. N 121-45.5 W LONGMIRE MINERAL SPRING	PIERCE	0000172	19.
46-12.12 N 121-29.52 W MT. ADAMS FUMAROLES	YAKIMA	0001347	E 50.
46-51.12 N 121-45.48 W MT. RAINIER FUMAROLES	PIERCE	0001334	R 62.
46-44.20 N 121-33.60 W OHANAPECOSH HOT SPRINGS	LEWIS	0000771	40.0
46-44.20 N 121-33.60 W OHANAPECOSH HOT SPRINGS	LEWIS	0001323	30.6
46-44.20 N 121-33.60 W OHANAPECOSH HOT SPRINGS	LEWIS	0001322	47.8
46-44.20 N 121-33.60 W OHANAPECOSH HOT SPRINGS	LEWIS	0001321	50.1
46-44.20 N 121-33.60 W OHANAPECOSH HOT SPRINGS	LEWIS	0001320	43.6
46-44.20 N 121-33.60 W OHANAPECOSH HOT SPRINGS	LEWIS	0001319	45.6
46-44.20 N 121-33.60 W OHANAPECOSH HOT SPRINGS	LEWIS	0001318	39.5
46-20.7 N 121-36.0 W ORR CREEK WARM SPRING	SKAMANIA	0000061	22.
46-20.70 N 121-36.00 W ORR CREEK WARM SPRINGS	SKAMANIA	0001338	21.7
46-34.5 N 121-42.4 W PACKWOOD HOT SPRING	LEWIS	0000060	38.
46-34.50 N 121-42.36 W PACKWOOD HOT SPRING	LEWIS	0001324	E 38.
46-42.20 N 121-29.00 W SUMMIT CREEK MINERAL SPRINGS (SODA SPRINGS)	LEWIS	0000761	13.0

HOQUIAM 1:250,000

46-50. N 123-48. W NEWSKAH MINERAL SPRINGS	GRAYS HARBOR	0001317	19.0
46-50. N 123-48. W NEWSKAH MINERAL SPRINGS	GRAYS HARBOR	0001309	17.5

WENACHEE 1:250,000

47-20.50 N 121-53.40 W GARLAND HOT SPRINGS (SAN JUAN HOT SPRINGS)	SNOHOMISH	0000769	21.0
47-53. N 121-21. W GARLAND MINERAL SPRINGS	SNOHOMISH	0000173	29.
47-29.0 N 121-23.1 W GOLDMEYER HOT SPRINGS	KING	0000046	50.
47-12.5 N 121-32.2 W LESTER HOT SPRINGS	KING	0000042	46.5
47-42.4 N 121-08.5 W SCENIC HOT SPRINGS	KING	0000043	47.
47-42.42 N 121-09.30 W SCENIC HOT SPRINGS	KING	0001314	50.

SEATTLE 1:250,000

47-58.90 N 123-41.20 W OLYMPIC HOT SPRINGS	CLALLAM	0000765	47.0
47-58.6 N 123-40.9 W OLYMPIC HOT SPRINGS	CLALLAM	0000041	48.5
47-58.10 N 123-52.10 W SOL DUC HOT SPRING	CLALLAM	0000763	50.0
47-58.1 N 123-51.8 W SOL DUC HOT SPRINGS	CLALLAM	0000040	51.

OKANOGAN 1:250,000

48-58.44 N 119-28.50 W HOT LAKE	OKANOGAN	0001325	R 45.
48-54.36 N 119-27.30 W POISON LAKE	OKANOGAN	0001326	R 45.

CONCRETE 1:250,000

48-45.90 N 121-40.20 W BAKER HOT SPRING	WHATCOM	0000753	42.0

48-47.34 N 121-48.24 W DORR FUMAROLE FIELD	WHATCOM	0001301	90.
48-10.00 N 121-02.00 W GAMMA HOT SPRING	SNOHOMISH	0000755	60.0
48-07. N 121-12. W KENNDEY HOT SPRINGS	SNOHOMISH	0000171	35.
48-07.10 N 121-11.70 W KENNEDY	SNOHOMISH	0000757	30.0
48-48.20 N 121-48.78 W SHERMAN CRATER FUMAROLES	WHATCOM	0001302 R	110.
48-15.30 N 121-10.80 W SULPHUR CREEK HOT SPRINGS	SNOHOMISH	0000767	30.0
48-15.5 N 121-10.5 W SULPHUR HOT SPRING	SNOHOMISH	0000170	37.

APPENDIX D

Sources for the records in the GEOTHERM sample file for Washington. Each reference is preceded by its abbreviated form (called CODE) used in the sample file (Table 1). Entries in this computer-generated appendix are sorted by CODE.

CODE = BERRY AND OTHERS, 1980

BERRY, G. W., GRIM, P. J., AND IKELMAN, J. A., 1980, THERMAL SPRINGS LIST FOR THE UNITED STATES: NATIONAL OCEANIC AND ATMOSPHERIC ADMISTRATION, KEY TO GEOPHYSICAL RECORDS DOCUMENTATION NO. 12, 59 P.

CODE = CAMPBELL AND OTHERS, 1970

CAMPBELL, K. V., MIERS, J. H., NICHOLS, B. M., OLIPHANT, JERRELYN, PYTLAK, SHIRLEY, RACE, R. W., SHAW, G. H., AND GRESENS, R. L., 1970, A SURVEY OF THERMAL SPRINGS IN WASHINGTON STATE: NORTHWEST SCIENCE, V. 44, NO. 1, P. 1-11.

CODE = MARINER AND OTHERS, 1982

MARINER, R. H., PRESSER, T. S., AND EVANS, W. C., 1982, CHEMICAL AND ISOTOPIC COMPOSITION OF WATER FROM THERMAL AND MINERAL SPRINGS OF WASHINGTON: U. S. GEOLOGICAL SURVEY OPEN-FILE REPORT 82-98, 18 P.

CODE = TABOR AND CROWDER, 1969

TABOR, R. W., AND CROWDER, D F., 1969, ON BATHOLITHS AND VOLCANOES--INTRUSION AND ERUPTION OF LATE CENZOIC MAGMAS IN THE GLACIER PEAK AREA, NORTH CASCADES, WASHINGTON: U.S. GEOLOGICAL SURVEY PROFESSIONAL PAPER 604, 67 P.

CODE = WHITE AND WILLIAMS, 1975

WHITE, D. E., AND WILLIAMS, D. L., ED., 1975, ASSESSMENT OF GEOTHERMAL RESOURCES OF THE UNITED STATES - 1975: U.S. GEOLOGICAL SURVEY CIRCULAR 726, 155 P.