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GEOTHERMAL DIRECT USE DEVELOPMENTS IN THE UNITED STATES

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ABSTRACT

Direct heat use of geothermal energy in the United States is recognized as one of the alternative energy resources that has proven itself technically and economically, and is commercially available. Developments include space conditioning of buildings, district heating, groundwater heat pumps, greenhouse heating, industrial processing, aquaculture, and swimming pool heating. Forty-four states have experienced significant geothermal direct use development in the last ten years. The total installed capacity is 5.7 billion Btu/hr (1,700 MW_t), with an annual energy use of nearly 17,000 billion Btu/yr (4.5 million barrels of oil energy equivalent). In this report we provide an overview of how and where geothermal energy is used, the extent of that use, the economics and growth trends. The data is based on an extensive site data gathering effort by the Geo-Heat Center in the spring of 1988, under contract to the U.S. Department of Energy.

INTRODUCTION

Expansion of geothermal energy projects will broaden the energy base of our country in the near term, further confirm an alternate energy technology based on domestic energy supplies, and thus could contribute in the long term to our nation's energy security.

Studies of the U.S. Geological Survey state that the resource base for geothermal is very large. Table 1 provides a summary of thermal energy available from low-to-moderate temperature identified geothermal systems in the United States (Muffler,1978 and Reed, 1982) and Figure 1 shows the location of known and potential geothermal resources.

Low-temperature geothermal resources occur in two types of geothermal systems-hydrothermal convection and conduction dominated which are quantified in Table 1. In hydrothermal convection systems, upward circulation of water transports thermal energy to reservoirs at shallow depths or to the surface. These systems commonly occur in regions of active tectonism and above-normal heat flow, such as much of the Western United States. In conduction-dominated systems, there exists high vertical temperature gradients in rocks that include aquifers of significant lateral extent. These conditions occur beneath many deep sedimentary basins throughout the United States (Reed, 1982).

Table 1. Summary of Thermal Energy from Low-to-Moderate Temperature Identified Geothermal Systems in the U.S.

System	Resource Temp. (°C)	No. Systems	Resource[a] (Wellhead Energy) ($\times 10^{15}$ Btu)
Hydrothermal-Convection	<90	1,119	29.4
	90 to 150	163	167.0
Conduction-Dominated to 3 km	<90	42	53.1
		1,324	249.5

a. Assumes a recovery factor of 0.25

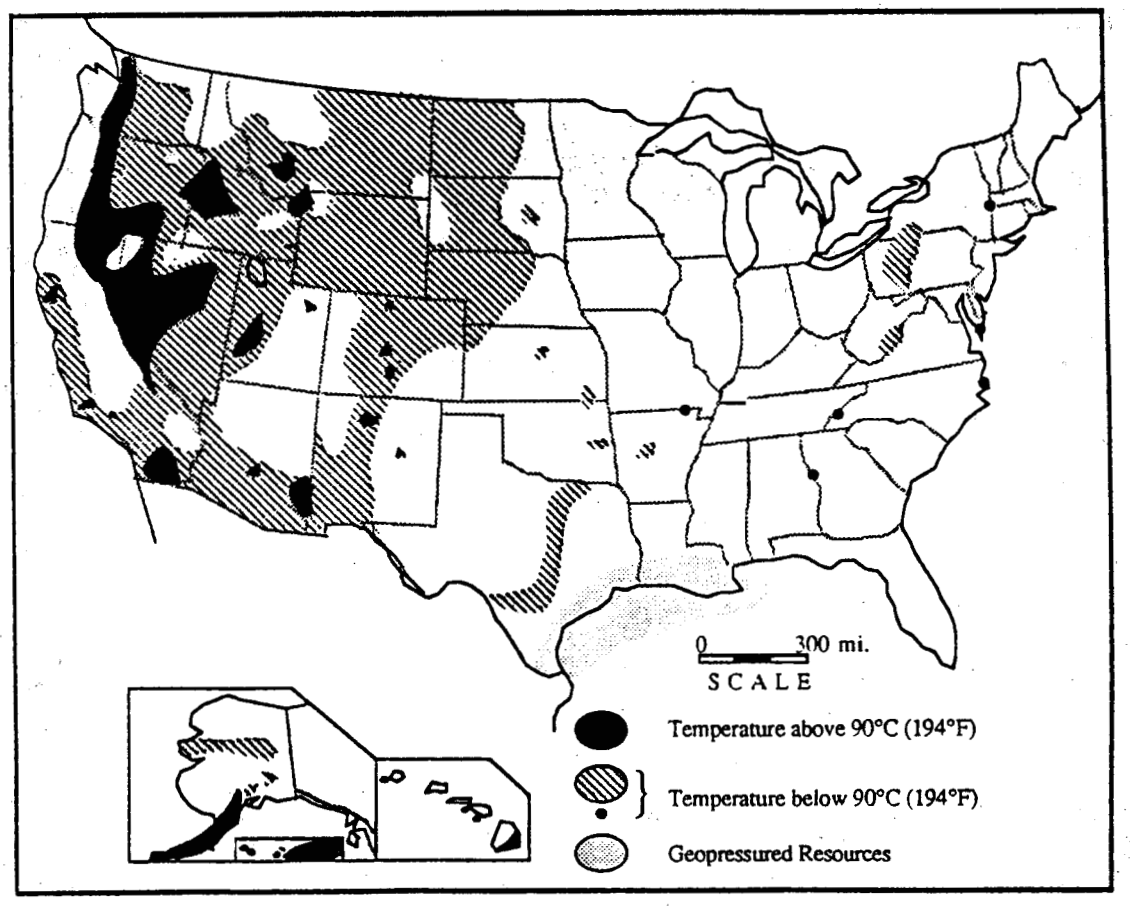

Figure 1. Known and potential geothermal resources (UURI).

Most people think of geothermal energy as a western states resource; however, there are significant projects developing this resource for space conditioning and district heating where low (45 to 70°F) temperature ground water aquifers exist in central and eastern states. Groundwater and earth coupled (vertical configuration) heat pump systems depend upon the average groundwater temperature. The temperature of the ground and aquifers below 100 feet is controlled by the geothermal gradient and thus are considered geothermal. Figure 2 shows the range of aquifer temperatures and the heating load factor which is the ratio of the average annual heat load to the peak heat load for one year.

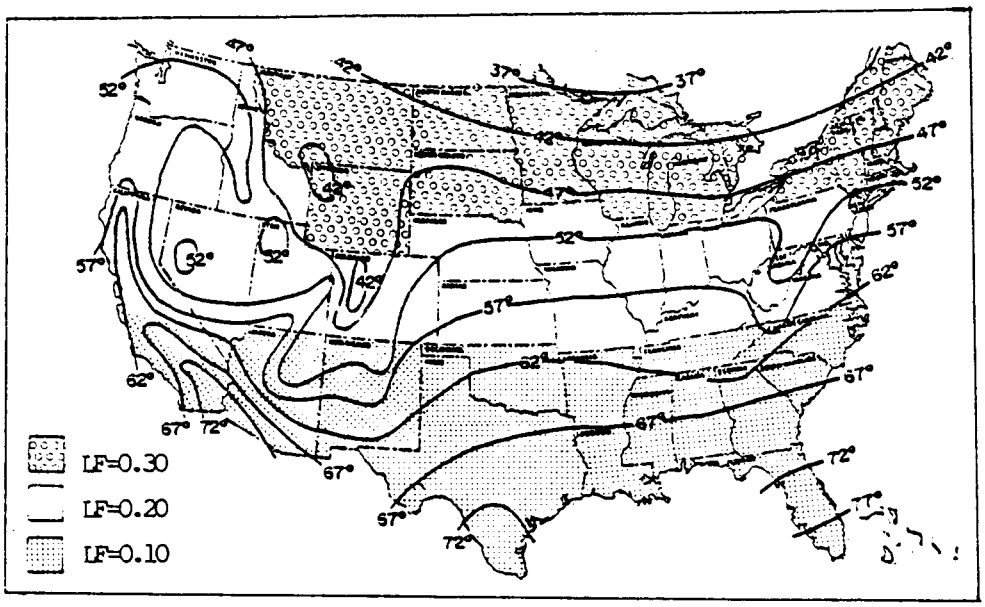

Figure 2. Groundwater temperature in wells ranging from 50 to 150 ft in depth and heating load factor map (National Water Well Institute).

Historically, direct uses of geothermal energy in the United States were by small resorts and limited space and district heating systems. The oil price shocks of the 1970's revived interest in the use of geothermal resources as an alternative energy source. Beginning in 1978, the U.S. Department of Energy initiated numerous programs that caused significant growth in this industry. These programs involved technical assistance to developers, the preparation of project feasibility studies for potential users, cost sharing of demonstration projects (space and district heating, industrial, aqricultural and aquaculture), resource assessments, loan guarantees, support of state resource and commercialization activities, and others. Also adding to the growth were various federal and state tax credit programs (Lunis, 1988).

STATE OF DIRECT USE DEVELOPMENT

This study identified 67,170 sites using geothermal energy for industrial, heat pumps, resorts and pools, aquaculture, greenhouses, space and district heating. Appendix A provides a description for over 370 locations and references for the source of information. The most significant findings resulting from the recent inventory of direct use projects are, the large number of installed ground water heat pumps, primarily a phenomena of the 1980's, and the increasing use of geothermal energy for aquaculture applications. The installed capacity of swimming pools and spas using geothermal fluid is much larger than previously reported. Several district heating systems are under development, others are expanding and the potential is very large for over 300 cities located near geothermal resources. These factors are incorporated into the comparison of direct use projects' summaries of previous investigations (Lunis, 1988) and the current inventory (Table 2). Other conditions contributing to the large increase of recorded geothermal direct use projects are the intensive effort in identifying heretofore unknown projects, and the increasing industry growth rate.

Table 2. Comparison of Inventories of Installed Geothermal Direct Use Projects

	Prior Survey[a]		Current Survey	
Application	Quantity (each)	Annual Energy ($\times 10^9$ Btu/y)	Quantity (each)	Annual Energy ($\times 10^9$ Btu/y)
Industrial	7	9625	16	8625
Heat Pumps	--	--	66,135	3602
Pools/Spas	85	240	114	1452
Aquaculture	8	400	18	970
Greenhouses	37	385	35	852
Space Heating	655	485	829	744
District Heating	20	405	23	700
	812	11,540	67,170	16,945

a. B. C. Lunis, Idaho National Engineering Laboratory, presentation made to the American Association of Petroleum Geologists, Rocky Mountain Section Meeting, September 15, 1987. The data base is restricted to earlier (1980) surveys that had limited updating.

The inventory identified 44 states (Figure 3) that have substantial geothermal energy developments representing an estimated annual energy utilization of nearly 17,000 billion Btu/yr. Tables 3 and 4 summarize by state these developments.

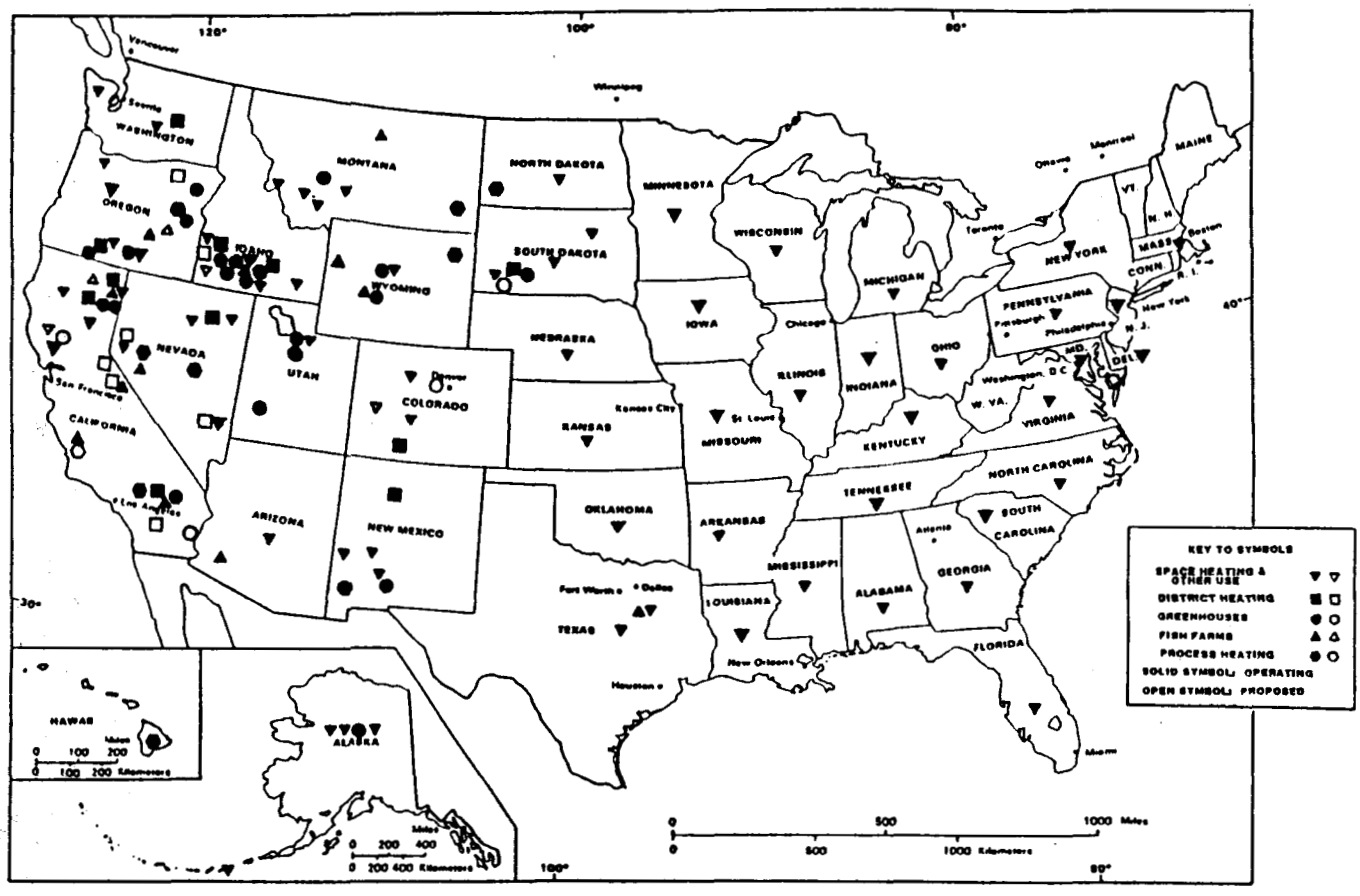

Figure 3. Location of direct heat projects in the United States.

The state with the largest use is Wyoming, the next largest states are Montana and California, due to secondary oil recovery ($8{,}200 \times 10^9$ Btu/yr) from the oil fields North and South Dakota, Wyoming and Montana. However, fluctuating oil prices may impact the degree to which it is utilized.

APPLICATIONS

Figure 3 shows the distribution of use according to application, which excludes the secondary oil recovery operation. Below each application is described, explaining how the resource is used, economics and growth trends.

Industrial

Industrial applications mostly need the higher temperatures while space heating and agriculture predominantly use low temperatures. Examples of industrial uses include; enhanced oil recovery (200°F); heap leaching operations to extract precious metals (230°F); dehydration of vegetables (270°F); mushroom growing (235°F); and others worldwide such as pulp and paper processing (400°F); hay drying (363°F); timber drying (200°F); and diatomaceous earth drying (360°F).

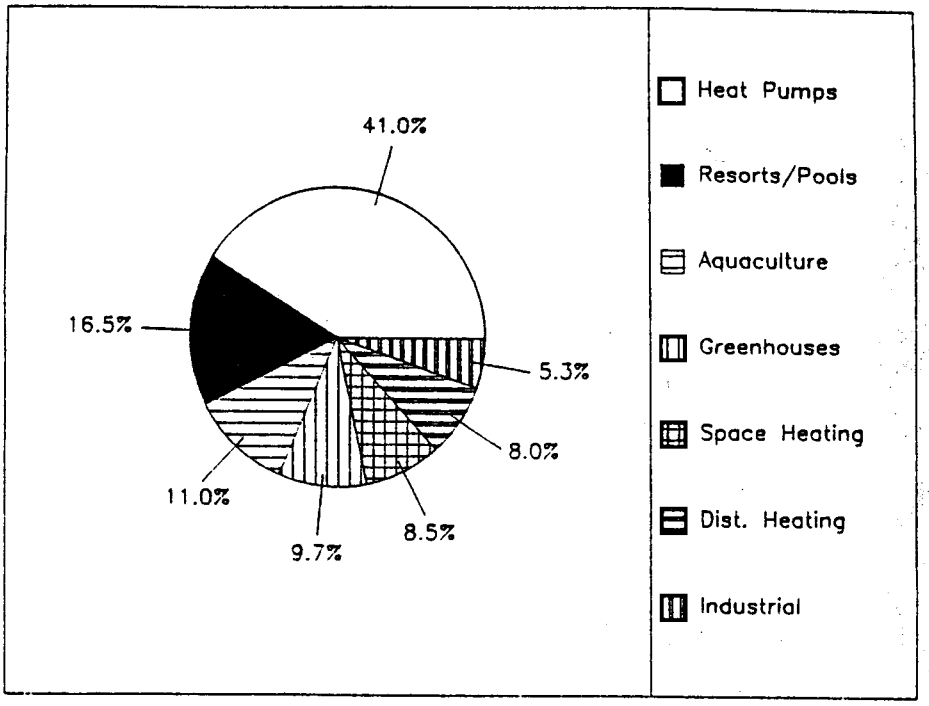

Figure 4. Geothermal use by application in the U. S. (excludes industrial enhanced oil recovery, 8,156 billion Btu/yr).

Drying and dehydration may be the two most important process uses of geothermal energy. A variety of vegetable and fruit products can be considered for dehydration at geothermal temperatures. Dehydration processes involve either continuous belt conveyors or batch dryers, using low temperature air from 100 to 200°F. Blowers and exhaust fans move the air over coils through which the geothermal fluid flows. The heated air then flows through the beds of vegetables or fruits on conveyors, to evaporate the moisture. Geothermal Food Processors near Fernly, Nevada dehydrate onions, garlic, celery, and carrots using 270°F geothermal fluid. This saves an estimated 86.0 billion Btu/yr which is equivalent to replacing 119 x 10^6 cubic feet of natural gas corresponding to a savings of about $350,000 per year. This plant has been operating since 1978.

When oil is produced, only about a third of the oil in the ground can be recovered by simply pumping production wells. Secondary recovery, the injection of water to move oil toward production wells, is often used to recover up to an additional third of the original oil. In the oil fields of North and South Dakota, Wyoming and Montana, geothermal fluid is produced with the oil from several deep zones. This fluid is often between 140 and 212°F as it is produced at the surface, and this heat is extremely useful in the secondary recovery of additional oil. Efficient secondary oil recovery is a function of the temperature and chemical compatibility of the injected water compared to the oil formation. To calculate the benefit from the use of geothermal

fluid, a comparison is made between the geothermal water and the energy needed to heat surface water to the same temperature. The estimated benefit for secondary oil recovery in the four states is $8,156.2 \times 10^9$ Btu/yr, however fluctuating oil prices may impact the degree to which it is utilized.

Large volumes of geothermal fluid are separated from oil production or are produced from other zones for use in secondary oil recovery. The injected water use in the four states mentioned above comes primarily from the Dakota Sandstone and the deeper Madison Limestone. Dakota aquifer water ranges between 140 and 170°F and Madison aquifer water ranges between 160 and 212°F.

New developments in 1988, are the use of geothermal fluids for enhanced heap leaching of precious metals in Nevada by heating the cyanide circuit. This represents and additional 300 billion Btu\yr of energy use or a 3 percent growth.

Heat Pumps

Ground water or earth coupled heat pumps are systems designed to use the earth as a heat source and/or sink. Geothermal fluid is either pumped or water is circulated through a pipe buried vertically in the ground, transfering thermal energy to or from a water-to-refrigerant heat exchanger in the heat pump. In a typical reversible heat pump the heat exchanger serves as the condenser or the evaporator, depending upon whether the heat pump is in a cooling or a heating mode. These types of heat pumps offer several distinct advantages over the use of air as a source or sink; the ground is usually at a more favorable temperature than the air, and the liquid-refrigerant exchanger permits a closer temperature approach than an air-refrigerant exchanger. The total effect is that the ground water and earth coupled systems shows improved performance when compared to air source systems.

Operating costs for a ground water heat pump will vary widely, depending on the size and construction of the building, the heating and cooling load, the geothermal fluid temperature and the price of electricity. Here is an example of a 100,000 square foot office building with a heating load of 2.0×10^6 Btu/hr and a cooling load of 250 tons for an equivalent 2,000 full load hrs per year. The temperature of the geothermal fluid is 75°F, pumped from a 200 ft level with a discharge pressure of 40 psi. A comparison of the estimated annual operating costs are:

1. Electric furnace

Heating:	879,000 kWh electricity @ $.05/kWh	$43,950
Cooling:	420,500 kWh electricity @ $.05/kWh	21,025
		$61,975

2. Natural Gas

Heating:	37,500 Therms @ $.50/Therm	18,750
Cooling:	420,500 kWh electricity @ $.05/kWh	21,025
		$39,775

3. Ground water heat pump

Heating:	199,300 kWh electricity @ $.05/kWh	9,965
Cooling:	400,500 kWh electricity @ $.05/kWh	20,025
Well pump:	170,000 kWh electricity @ $.05/kWh	8,500
		$38,490

The savings from the ground water heat pump would be greater if the waste heat from the heat pump were utilized as in the case of four pipe system, which is usually the case for large office buildings. The example represents a two pipe system, either heating or cooling.

The fastest growing segment of the market is ground water and earth coupled heat pumps used for space heating and cooling. It is estimated that almost 50,000 ground water systems and over 30,000 closed loop earth coupled systems (2/3 of these are vertical and 1/3 horizontal pipe installations in the ground) are being used in the U.S. In 1988 there will be over 8,000 ground water and 10,000 earth coupled systems installed, a 50 percent increase over last year. The popularity of these systems is due to the recent promotion by electric utility companies throughout the country, mainly in the midwest and east. It has national appeal since ground water temperatures down to 45°F can be used in heat pump systems.

Resorts and Pools

Geothermal energy used for swimming pools and spas is the earliest use of the resource. Natatoriums and large resorts developed at hot springs, located in both the eastern and western United States, were popular in the 1800's and were reminiscent of those in Europe. Many of these continue to be used today and in some cases elaborate facilities have been developed. For example, Fairmont Hot Springs Resort, a major new all-year resort near Butte, Montana is using a 640 ft geothermal well (160°F) for space heating a 140-room hotel, mini-zoo, game room and restaurant in addition to large indoor and outdoor swimming pools. The resort also boasts a golf course, convention center and time-share condominiums.

The survey identified 114 resorts using geothermal energy, the largest being Paynes Fountain of Youth and Hot Springs State Park in Wyoming.

Greenhouses

A number of commercial crops can be raised in greenhouses, making geothermal resources in cold climates particularly attractive. Crops include vegetables, flowers (potted and cut), house plants and tree seedlings.

Greenhouse heating can be accomplished by several methods; finned pipe, unit heaters, finned coils, soil heating, plastic tubing, cascading, and a combination of these methods (Rafferty, 1981). The use of geothermal energy for heating can reduce operating costs and allows operation in colder climates where commercial greenhouses would not normally be economical.

Economics of a geothermal greenhouse operation depend on many variables, such as the type of crop, climate, resource temperature, type of structure, etc. An example, is the raising of roses near Helena, Montana where using geothermal energy in a 75,500 ft^2 greenhouse reduces heating costs by 80 percent and overall costs by 35 percent.

Greenhouses are one of the fastest growing applications in the direct use industry. A number of the existing greenhouse systems are expanding. For example, Troy Hygro, Newcastle, Utah is building an additional 28 acres, which will result in a 100% increase in the total U.S. utilization for greenhouses. Other systems expanding are Utah Roses, Bluffdale, Utah, Flint Greenhouses near Buhl, Idaho (doubling in size) and a new experimental facility and commercial space with a geothermal delivery system is being constructed by Lake County, California.

Troy-Hygro greenhouses will be the largest greenhouse energy user when the 28 acre facility is completed. Burgett Floral at Animas, New Mexico has developed about 13 acres and the state with the largest total use for greenhouses is Idaho with 14 sites in operation.

Aquaculture

Aquaculture involves the raising of freshwater or marine organisms in a controlled environment to enhance production rates. The principal species that are typically raised are aquatic animals such as catfish, bass, tilapia, sturgeon, shrimp, and tropical fish. The application temperature in fish farming depends on the species invloved. Typically, catfish grow in 4 to 6 months at 64 to 75°F, trout in 4 to 6 months at 55 to 64°F and prawns in 6 to 9 months at 80 to 86°F. The benefit of a controlled rearing temperature in aquaculture operations can increase growth rates by 50 to 100% and thus increase the number of harvests per year. Water quality and disease control are very important in fish farming.

In the U.S. aquaculture projects using geothermal water exist in Arizona, Idaho, Oregon, and California. Aquaculture is one of the fastest growing applications for using low-temperature geothermal energy. Recently, four locations in Arizona began raising catfish, tilapia and bass using geothermal fluids with temperatures ranging from 80 to 105°F and a large facility is planned for raising sturgeon at Brooks Warm Springs, Montana.

Aquaculture projects at the Hot Creek Hatchery near Mammoth Lakes, California and the Fish Breeders of Idaho, Buhl, Idaho are the largest aqcuaculture use sites.

Space and District Heating

District heating involves the distribution of heat (hot water or steam) from a central location, through a network of pipes to individual houses or blocks of buildings. The distinction between district heating and space heating systems, is that space heating usually invlolves one geothermal well per structure.

An important consideration in district heating projects is the thermal load density, or the heat demand divided by the ground area of the district. A high heat density is required to make district heating economically feasible, since the distribution network which transports the hot water to the consumers is expensive.

Geothermal district heating systems are capital intensive. The principal costs are initial investment costs for production and injection wells, downhole and circulation pumps, heat exchangers, pipelines and distribution network, flowmeters, valves and control equipment, etc. Operating expenses, however are in comparison lower and consist of pumping power, system maintenance, control and management. The typical savings to consumers range from about 30 to 50% of the cost of natural gas.

A showcase of district heating developments are the two systems at Elko, Nevada. Elko Heat Company is a private company that has experienced considerable growth since it first began operating in 1982. The project started as a USDOE Program Opportunity Notice demonstration project consisting of three buildings; a laundry, bank, and hotel/casino. The system has grown to include 14 commercial buildings and a sewage treatment plant. This was accomplished by offering a preliminary estimate of customer needs to retrofit, educating about the reliability of the system (down less than one day per year) and charging its customers about 50 percent the price of natural gas ($1.00 to $1.25 per 1,000 gallon of geothermal fluids). The system supplies about 36.7 billion Btu/yr from its one geothermal well that produces 650 gpm at 170°F. The company has doubled the length of its delivery piping system and has reached the demand point where it will be necessary to drill a second well.

The Elko County School District in conjunction with the Elko Hospital, has been servicing the High School, Jr. High (heat pump system), gymnasium, school administrative offices, hospital, convention center, city hall and the municipal pool for about two years. One of the most impressive aspects of this system is the 100°F temperature drop through the closed loop servicing the buildings from two plate heat exchangers in parallel. An injection well was drilled, but is not used due to concern of contamination of domestic aquifers. Disposal of geothermal fluids is to percolation ponds, storm drains, and a golf course irrigation system.

Others that have experienced considerable growth are San Bernardino, California system and Warren Properties at Reno, Nevada (doubling is size). When completed, Mammoth Lakes district heating will be the largest development in the country. This is followed by the Litchfield Correctional Center at Susanville, California and the two systems in Boise, Idaho, the downtown commercial system and the Boise Warm Springs residential system.

The Peppermill Casino, Reno, Nevada has the largest space and domestic hot water use followed by the 500 individual homes that utilize downhole heat exchangers in Klamath Falls, Oregon.

The potential for geothermal district heating in the United States is very large. An inventory identifies a total of 1,277 hydrothermal sites within five miles of 373 cities in eight Western states, with a combined population of 6,720,000 persons. The combined heat load for all cities (exclusive of industrial loads) is estimated at 1.3×10^{14} Btu/yr (Allen, 1980). Currently 23 geothermal district heating systems are operating (700×10^{9} Btu/yr) and 26 planned projects should increase the annual energy use by 1,690 billion Btu per year.

CONCLUSIONS

The contained heat energy beneath the United States could, in theory, provide most of the future low temperature energy needs of this Nation. The actual contribution will be determined by the effort - time, people, and funding - devoted to a broad research, development, and demonstration program with participation by Federal, state, and local governments in cooperation with industry, universities, laboratories and the American people.

The United States direct use industry is and will continue to experience a significant growth rate. The largest growth should continue to occur in the use of groundwater heat pumps, and aquaculture, greenhousing and district heating will add to the expansion of the industry.

Table 3
Geothermal Direct Use Projects in the United States

08/23/88

STATE	SITE	APPL. TYPE	RES. TEMP. (F)	MAX. FLOW (gpm)	CAPACITY (million Btu/h)	ANNUAL ENERGY (billion Btu/y)
AK	Chena Hot Springs	S, G, P	135	222	3.3	15.5
	Manley Hot Springs	S, G, P	138	175	2.6	12.6
	Circle Hot Spring	S, G, P	140	130	2.3	11.0
	Melozi	S, P	131	130	1.3	7.2
	Bell Island	S, P	162	30	0.5	2.5
	Tenakee	P	109	22	0.1	0.7
	Goddard	P	153	13	0.1	0.7
	Baranof	S, P	151	100	0.1	0.7
	Ophir Creek	S	145	225	0.1	0.2
			Total	1047	10.4	51.1
AL	All of State	HP	67	1600	8.3	7.3
AR	All of State	HP	63	4800	75.6	66.2
	Hot Springs National Park	S, P	139	250	1.2	6.9
			Total	5050	76.8	73.1
AZ	Hyder Valley	A	105	4000	40.0	140.2
	Safford	A	105	1000	10.0	35.0
	Near Tuscon	A	80	800	8.0	28.0
	Hyder Valley	A	105	850	7.0	24.5
	All of State	HP	62	0	3.6	3.2
	Castle Hot Springs	P	131	340	0.5	2.5
	Buckhorn Mineral Wells	S, P	140			
	Safford	P	108			
			Total	6990	69.1	233.4
CA	Hot Creek Hatchery	A	61	18850	25.6	201.7
	Mammoth Lakes (under constr.)	DH	300	650	58.0	120.0
	Litchfield Correctional Center	DH	170	1250	26.0	78.0
	Paso Robles Fish Farm	A	104	1000	10.0	70.0
	Pacific Aqua Farms	A	140	650	17.9	62.6
	San Bernardino District Htg	DH	138	1425	23.6	45.7
	Murrieta Hot Springs Resort	P	140	300	8.3	43.6
	Arrowhead Fisheries	A	74	1570	5.5	38.5
	Warner Springs Ranch (Resort)	S, P	137	130	6.0	37.0
	Ramco Farms	G	175	600	13.0	29.5
	Bridgeport (under constr.)	DH	170	800	13.0	27.0
	Vichy Hot Springs	S	90	65	0.1	26.4
	Pan Hot Springs	P	90	0	7.3	25.5
	Ft. Bidwell (Indian Res)	S, A	205	1500	6.4	23.4
	Desert Hot Springs	S, P	200	350	2.3	20.0
	Susanville District Heating	DH	170	750	8.0	18.0
	Calistoga Private and Commer	I, P, S	275	105	2.3	15.0
	Nakashima Nurseries	G	120	2000	15.0	13.1
	Modoc High School	S	170	650	5.2	13.0
	Sycamore Hot Spring (Resort)	P	109	150	2.2	13.0
	Aqua Caliente Springs Resort	P	97	70	1.4	12.0
	Konocti Harbor Inn	P	107	130	1.6	11.0
	Tsuji Nurseries	G	140	350	4.8	9.2
	Fountain of Youth Spa	P	137	0	1.2	8.4
	Lake Elsinore	P	120	80	1.2	8.4
	Glen Ivy Hot Springs (Resort)	P	106	165	1.2	8.0
	Calistoga District Heating	DH	223	500	4.0	7.4
	Town of Tecopia	P	118	0	1.0	7.0
	Kelly Hot Springs	A, G	200	650	0.8	6.6
	Paraiso Hot Springs (Resort)	P	115	700	10.4	6.0
	Tassajara Buddhist Meditation	P	110	152	0.7	5.5
	Furnace Creek Inn	P	89	350	0.8	4.9
	Avila Hot Springs	S, P	131	50	0.5	4.9
	Furnace Creek Ranch	P	89	350	0.8	4.9
	Cedarville Elem. & High School	S	134	115	1.4	4.8
	Grover Hot Springs State Park	P	147	105	0.6	4.7

Appl. Type Key: S = Space Heating, DH = District Heating,
HP = Heat Pump, G = Greenhouse, I = Industrial Process,
A = Aquaculture, P = Swimming Pools

Table 3
Geothermal Direct Use Projects in the United States 08/23/88

STATE	SITE	APPL. TYPE	RES. TEMP. (F)	MAX. FLOW (gpm)	CAPACITY (million Btu/h)	ANNUAL ENERGY (billion Btu/y)
CA	Wilbur Hot Springs	P	152	30	0.6	4.7
	Campbell Hot Springs	P	115	80	0.6	4.7
	Whitmore Hot Springs	P	95	400	0.6	4.7
	Harbin Hot Springs	P	120	53	0.6	4.7
	Indian Springs School	S	127	300	2.0	4.5
	Esalen Institute	P	120	75	0.6	4.4
	California Hot Springs	P	126	50	0.7	4.3
	Calisoga High School	S	200	50	3.0	3.9
	Keough Hot Springs	P	128	528	0.5	3.9
	Palm Springs Spa	P	106	35	0.5	3.5
	La Vide Mineral Springs	P	120	50	0.5	3.0
	Orr Hot Springs	P	103	30	0.4	2.8
	Bashfords Hot Mineral Spa	P	145	0	0.4	2.8
	White Suphur Springs	S, P	85	39	0.4	2.7
	San Luis Bay Estates	P	106	60	0.5	2.6
	Surprise Valley Hospial	P	108	43	0.7	2.2
	LDS Church	S	128	90	0.9	2.0
	Shoshone Motel & Trailer Park	S	93	200	0.3	1.9
	Aqua Caliente County Park	P	90	0	0.3	1.8
	Drakesbad Guest Ranch	P	180	20	0.5	1.4
	Imperial Sea View Hot Springs	P	165	0	0.2	1.2
	Mono Hot Springs	P	107	53	0.2	1.0
	Indian Valley Hospital	S	117	285	0.5	0.9
	Matilija Hot Springs	P	109	75	0.1	0.7
	Democrat Hot Springs Resort	P	102	15	0.8	0.7
	San Juan Hot Springs	P	125	20	0.1	0.6
	Big Bend Preventorium	G, P	180	90	0.1	0.4
	Lake Elsinore Dist. Heating	DH	134	500	0.3	0.2
	Aqua Farms International	A	92	1500	3.7	0.2
	Jacumba Hot Springs Health Spa	P	97	15	0.0	0.1
	Lake County Ag Park	G	152	400	0.3	0.0
	Saline Valley Hot Springs	P	107			
	Reds Meadow Hot Springs	P	115	15		
	Miracle Hot Spring	S, P	122	15		
	Arrowhead Hot Springs	S, P	190	500		
	Twenty-Nine Palms (City of)	S, P	140			
	California Pines	DHW	100			
	Hot Creek	P	200	4000		
	Tecopia Hot Springs	S, P	108	200		
	Fales Hot Springs	S, P	142	300		
	Modesto Memorial Hospital	S	78	905	5.0	
	Nevares Springs	DHW	104			
			Total	47583	314.0	1107.2
CO	Sand Dunes Hot Spring	A	118	500	13.3	81.2
	Glenwood Hot Springs Hotel	P, S	130	2263	9.0	63.4
	Roaring Judy Fish Hatchery	A	65	1100	7.1	62.6
	Pagosa Springs District Htg.	DH	149	800	3.6	35.5
	Jones Splashland	P	106	310	2.8	19.0
	The Spa Motel	S, P	123	220	2.7	14.1
	Pagosa Springs Private Wells	S	120	675	5.0	13.0
	Waunita Hot Springs Ranch	S, G, P	175	100	2.5	13.0
	All of State	HP	52	0	7.2	12.6
	Steamboat Springs Health & Rec	P	104	140	1.7	11.8
	Ouray Municipal Pool	S, P	156	180	1.4	9.6
	Old Wright Well	G	160	120	1.6	7.2
	Jump Steady Resort	S, P	119	90	1.0	7.0
	Cottonwood Hot Springs	S	119	10	0.2	6.3
	Valley View Hot Springs	P	99	180	0.8	5.7
	4 UR Guest Ranch	P	135	50	0.8	5.3
	Salida Hot Springs(Poncha Spr)	S, P	160	200	0.8	4.9
	Hot Sulphur Springs	S, P	111	60	0.7	4.9
	Indian Springs Resort	P	115	60	0.8	4.3
	Wiesbaden Motel & Health Res.	S, P	117	60	0.7	3.8
	Pinkerton Hot Springs	S, P	93	77	0.3	2.1
	Mount Princeton Hot Springs	P, DHW	132	175	0.4	1.8
	Twin Peaks Motel	S, P	110	15	0.2	1.1

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CO	Box Canyon Motel	S, P	110	15	0.2	1.1
	Mount Princeton Area	S, P	132		0.3	0.6
	Health Spa	S, P	114	6	0.1	0.4
	Lope Hot Springs	P	132	20	0.1	0.4
	Cement Creek Ranch	P	78	70	0.1	0.4
	Dunton Hot Springs	P	107	25	0.1	0.3
	Trip Hot Springs	G, P	111			
	Glenwood Springs Vapor Caves	P				
	Ouray District Heating	DH	156	780		
	Canon City Area	S				
			Total	8301	65.5	393.4
DE	All of State	HP	57	4000	20.5	35.9
FL	All of State	HP	75	160000	800.0	700.8
	Patrick Air Force Base	HP	72	8000	39.6	138.8
			Total	168000	839.6	839.6
GA	All of State	HP	67	4800	24.5	21.4
	Roosevelt Warm Springs Inst.	S, HP, P	88	800	1.1	3.4
			Total	5600	25.6	24.8
HI	Community Geothermal Tech Prog	I	347	110		
IA	All of State	HP	52	2400	23.4	41.0
ID	Fish Breeders of Idaho	A	90	6200	24.8	174.0
	Boise City Geo. Dist. Heating	DH	170	700	17.5	42.8
	Idaho Capitol Mall	DH	162	750	15.8	31.7
	Warm Spgs. Water District	DH	170	700	12.3	30.0
	Lava Hot Springs	S, P	112	1800	3.0	20.2
	Flint Greenhouses	G	112	570	9.1	19.9
	College of Southern Idaho	HP	102	1220	8.2	18.0
	Cal Flint Floral	G	160	490	7.5	16.4
	M&L Greenhouses	G	112	460	7.4	16.2
	Jack Ward Greenhouses	G	138	390	6.9	15.1
	Lunty Tropical Fish	A	90	400	2.0	14.0
	Warm Springs Greenhouses	G, S	180	240	6.0	13.1
	Fort Boise Veteran's Hospital	S	162	300	6.0	12.1
	Schutz's Hot Spring	S, P	176	600	3.2	10.8
	Edward's Greenhouses	G	117	265	4.9	10.7
	Bald Mountain Hot Springs	P	168	2	2.8	10.0
	Crook's Greenhouse	G	194	140	4.0	9.0
	Sligar's Thousand Springs Res.	P	200	140	1.3	7.7
	Hunt Brothers Floral	G, S	117	200	3.0	6.6
	Ketchum District Heating	DH	158	1027	3.0	6.6
	Jim's Hot Springs	P	151	60	0.8	5.3
	Heise Hot Springs	P	120	80	1.0	4.4
	Bliss Greenhouse	G, S, A	151	60	1.2	3.7
	Silver Creek Plunge	P	101	110	0.9	3.6
	Haven Lodge	P	148	50	0.5	3.5
	Warm Springs Resort	P	110	100	0.9	3.2
	Donlay Ranch Hot Spring	G	130	72	1.2	3.2
	Miracle Hot Springs	S, P	139	50	0.7	2.9
	Downatta Hot Springs	P	112	80	0.6	2.5
	Banbury Hot Springs	S, P	131	80	0.8	2.3
	Robinson Bar	P	135	40	0.6	2.3
	Challis Hot Springs	P	127	40	0.5	2.2
	Indian Springs Natatorium	P	90	120	0.6	2.1
	Green Canyon Hot Springs	G, P	118	80	0.6	2.0
	Bear Lake Hot Springs	P	115	40	0.3	1.3
	Corral	S, G	167	31	0.6	1.2
	Bergdorf Hot Spring	S, P	113	162	0.4	1.2

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ID	LDS Church	S	93	80	0.4	0.9
	Del Rio Hot Springs	S, G	200	20	0.4	0.9
	Riggins Hot Springs	G, S	113	50	0.4	0.8
	Express Farms	G	99	47	0.4	0.8
	Weiser Hot Springs	G, S, P	158	15	0.3	0.7
	Givens Hot Springs	P	120	650	0.2	0.5
	Stanley Dist. Htg. (proposed)	DH	140	290	0.0	0.0
	Twin Springs Resort	S, P	180			
			Total	19001	163.0	536.4
IL	All of State	HP	54	8400	100.8	176.6
IN	All of State	HP	54	32000	187.2	328.0
	Corporate Square	HP	55	0	4.2	7.4
			Total	32000	191.4	335.4
KS	All of State	HP	57	1600	8.0	14.0
	Elementary Schools (3)	HP	59	440	4.7	3.3
			Total	2040	12.7	17.3
KY	All of State	HP	59	4200	88.2	154.5
LA	All of State	HP	69	0	90.0	78.8
MA	English High School	HP	55	80	0.4	0.9
MD	All of State	HP	57	6400	46.8	82.0
MI	All of State	HP	47	28000	135.0	354.8
MN	All of State	HP	45	6800	36.0	94.6
MO	All of State	HP	57	8000	54.0	47.3
MS	All of State	HP	67	800	4.0	3.5
	Mississippi Power Co.	HP	69	0	1.1	0.9
	Commercial Buildings	HP	69	0	1.0	0.9
			Total	800	6.1	5.3
MT	Secondary Oil Recovery	I	200	9000	542.7	3803.0
	High Country Rose Greenhouses	G	151	207	8.4	33.1
	White Sulfur Springs	DH	136	460	5.3	16.2
	Warm Springs State Hospital	S	154	90	1.9	14.6
	Fairmont Hot Springs Resort	S, P	160	200	3.0	14.5
	Lolo Hot Springs	S, P	111	180	1.8	12.6
	Bozeman Hot Springs	S, P	131	977	2.0	5.8
	Broadwater Athletic Club & HS	S, P	153	100	1.4	5.6
	Chico Hot Springs	P	113	320	0.8	4.6
	Boulder Hot Springs	S, P, G	169	500	1.0	4.4
	Jackson Hot Springs Lodge	S, P	136	259	0.5	2.9
	Medicine Hot Springs	P	113	100	0.6	2.6
	Sleeping Child Hot Springs	P	113	530	0.7	2.5
	Barkell's Hot Springs	P	161	150	0.7	2.2
	New Biltmore Hot Springs	P	127	26	0.3	1.8
	Ennis Hot Springs	I	181	100	0.8	1.7
	Camas Hot Springs	P	104	24	0.2	0.7
	Hillbrook Nursing Home	S, P	133	100	0.2	0.6
	Brooks Warm Springs	A	70	72000	0.0	0.0
			Total	85323	572.3	3929.4

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NB	Northern Part of State	HP	52	2400	23.4	41.0
	Homestead National Monument	HP	58	32	0.2	0.3
			Total	2432	23.6	41.3
NC	All of State	HP	63	16800	91.8	80.4
ND	Secondary Oil Recover	I	170	1500	75.1	526.2
	All of State	HP	42	2400	18.0	47.3
	Buxton School	HP	42	0	1.2	3.2
			Total	3900	94.3	576.7
NJ	All of State	HP	55	2400	23.4	41.0
NM	Burgett Floral Greenhouses	G	245	250	18.6	65.3
	New Mexico State University	S, DHW	142	417	3.7	45.9
	Ojo Caliente Resort	P	115	60	0.5	2.0
	Jemez Springs	S	165	0	0.6	1.3
	Truth or Consequences	P	113			
	Masson Greenhouses	G				
			Total	727	23.4	114.5
NV	Round Mountain Gold Corp	I	186	650	30.0	262.8
	Hunt's Ash Springs	P	97	9000	22.5	157.7
	Geothermal Food Processors	I	270	1000	19.0	86.0
	Warren Properties	DH,DHW	212	710	33.0	72.3
	Peppermill Inn & Casino	S, P	127	1200	24.0	63.0
	Warm Spring Resort	P	90	3240	8.0	63.0
	Pegusus Gold Corp Florida Cany	I	238	400	4.6	40.0
	Elko Disrict Heat	DH	178	805	16.8	36.7
	Reno-Moana Area (200)	S	120	0	14.0	31.8
	Walley Hot Spring Resort	S, P	160	130	4.6	27.9
	Elko County School District	DH,S,HP	190	300	7.2	15.7
	Hobo Hot Springs	A	106	100	2.0	14.4
	Warren Estates	DH	209	1000	3.6	7.9
	Moana Municipal Pool	P	127	109	2.6	7.7
	Caliente City Pool	P	175	150	3.4	7.4
	Carson Hot Springs	P	120	75	0.8	5.7
	Bowers Mansion	P	116	75	1.4	4.7
	Brockway Springs Resort	P	180	150	0.5	3.9
	Caliente Hot Springs Motel	P	115	40	0.4	2.4
	Carlin High School	HP	87	60	0.9	2.0
	Wells High School	HP	87	50	0.8	1.6
	Medical Center	S	167	46	0.7	1.5
	Wabuska	A	270	1300	0.0	0.0
	Lakeview Apartments	DHW	130			
	Baileys Hot Springs	P	160			
	Wells Rural Electric	HP				
	Aqua Caliente Trailer Park	S	152	200		
	Gerlach Hot Springs	P	200			
	Elko Jr. High School	S	190	300		
	Salem Plaza	S,DHW	160			
	Steamboat Springs (Spa)	S, P	200	590		
			Total	21680	200.8	916.1
NY	All of State	HP	47	2000	11.2	29.3
	Sagamore Resort	HP	46	0	4.2	11.0
	E. Middle School & Cayuga C.C.	S, HP	125	60	2.0	4.5
			Total	2060	17.4	44.8

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OH	All of State	HP	53	25600	129.6	227.0
OK	Central Part of State	HP	62	240	1.2	1.0
OR	Oregon Trail Mushrooms	I	235	275	20.6	54.1
	Klamath Residence (505)	S	200	0	20.2	44.2
	Oregon Institute of Tech.	DH	192	620	16.8	38.2
	Kah-nee-ta	P, DHW	126	450	4.5	27.6
	Merle West Medical Center	S	191	325	10.5	23.9
	Klamath County Jail	S	150	700	10.5	23.0
	Klamath Schools (7)	S	180	0	8.7	19.8
	Klamath Apartment Bldgs. (13)	S	180	0	6.5	14.2
	The Greenhouse	G	220	700	4.7	8.8
	Maywood Industries of Oregon	S	118	450	3.0	6.8
	Aq Dryers	I	200	60	3.0	6.5
	Klamath District Htg. System	DH	210	720	2.8	6.2
	Liskey Greenhouses	G	199	500	2.7	5.9
	Belknap Hot Springs	P	160	50	0.9	5.5
	Jackson Hot Springs	S, P	111	264	0.7	4.4
	Klamath Swimming Pools	P	180	0	1.1	4.3
	Breitenbush Hot Springs	S, P	212	900	1.2	3.9
	Klamath Churches (4)	S	190	0	1.7	3.9
	Radium Hot Springs	S, P	136	300	0.6	3.6
	Klamath Co. Shops	S	118	113	1.6	3.6
	YMCA	S, P	147	120	1.4	3.1
	Highway De-icing	I	190	0	0.4	2.5
	Thunderhead Lodge	HP	68	130	1.2	2.3
	Public Swimming Pool	P	180	20	0.8	1.8
	Hot Lake RV Park	S, P	190	830	0.9	1.8
	Baker Swimming Pool	P, HP	75	200	0.6	1.8
	Hunters Hot Spring	S	202	78	0.8	1.7
	Cove Hot Spring	G	108	226	0.7	1.4
	Greenhouses	G	195	40	0.6	1.3
	Medical Hot Springs	S, P	140	100	0.5	1.1
	Austin Hot Springs	P	186	250	0.2	1.0
	Lakeview Residences	S	190	50	0.4	0.9
	Vale Slaughter House	S	150	20	0.3	0.7
	Vale Residences	S	185	24	0.3	0.7
	Jackson Greenhouses	G	111	100	0.3	0.5
	Olene Gap	S	189	300	0.1	0.1
	Langel Valley	S	147	20	0.1	0.1
	Adrian	I	168	150	0.0	0.0
	Summer Lake Hot Springs	S, A	109	20		
	Commercial Bldgs. (9)	HP				
			Total	9105	131.9	331.2
PA	All of State	HP	50	12000	68.4	119.8
	Factory at Masontown	HP	52	0	1.0	1.7
			Total	12000	69.4	121.5
SC	All of State	HP	67	11200	61.2	53.6
SD	Secondary Oil Recovery	I	170	1000	47.8	334.9
	Evan's Plunge	P	87	10340	5.2	36.2
	All of State	HP	47	2000	13.5	35.5
	St. Joseph Indian School	HP	73	935	7.7	20.6
	Philip District Heating	DH	155	300	8.4	17.8
	St. Mary's Hospital	S	108	385	5.6	11.4
	Lake Wagner Greenhouses	G	154	250	4.3	9.3
	Diamond Ring Ranch Heat./Proc.	S, I	152	170		
			Total	15380	92.5	465.7
TN	All of State	HP	61	840	17.6	15.4

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TX	All of State	HP	67	3600	147.9	129.6
	Cotulla High School	S	109	600	9.9	13.0
	Stacy Park Pool	P	96	250	0.9	5.5
	Navarro College	G, A	126			
	Marlin Hospital	S				
			Total	4450	158.7	148.1
UT	Tryo Hygro (28a. under constr)	G	230	246	138.0	471.0
	LDS Office Building	HP	60	0	27.0	47.3
	Utah Ross	G	124	1200	20.4	44.6
	Como Springs Resort	P	82	540	1.1	37.8
	Utah Roses	G	190	400	10.4	32.0
	Crystal Hot Springs	P, A	140	1800	3.5	21.4
	Utah State Prison	S, DHW	178	500	7.0	15.3
	Saratoga Springs Resort	S, P	120	150	2.0	8.7
	Monroe Hot Springs	P, S, G	164	600	1.0	7.8
	Belmont Springs	P	131	3600	1.5	7.8
	Veyo Resort	P	98	120	1.0	4.2
	Pah Tempe	P, S	108	10000	0.4	2.4
	The Homestead	P	95	60	0.1	2.0
	Mountain Spa Resort	P	115	1268	0.5	1.7
			Total	20484	213.9	704.0
VA	All of State	HP	59	4000	36.0	63.1
	Homestead Resort	S, HP, P	104	223	1.1	2.9
			Total	4223	37.1	66.0
WA	Clark College	HP	55	850	6.8	13.8
	Grant County Courthouse	HP	84	600	3.7	8.4
	Yakima County Jail	HP	76	700	3.6	7.3
	Chinook Tower	HP	60	500	3.1	6.6
	Cowlite Co. Courthouse	HP	55	400	3.0	6.0
	Sundown M Ranch	HP	70	180	1.8	3.7
	Sol Duc Hot Springs	P	128	50	0.5	1.2
	Adams Co. Fire Station	HP	80	10	0.2	0.2
	Casey House	HP	70	10	0.1	0.2
	Farm Credit Services Bldg.	HP	0	0	0.0	0.0
	Skove Bldg.	HP				
	Dept. of Health & Social Serv.	HP	56			
	Nazarene Church	HP				
	Grant Co. PUD	HP	80			
	Red Cross Bldg.	HP				
	Uelikamje, Moore & Shone, Inc.	HP				
	Elephant House at Zoo	HP				
			Total	3300	22.8	47.4
WI	All of State	HP	46	13600	720.0	189.2
WY	Secondary Oil Recovery	I	200	8300	498.3	3492.1
	Hot Springs State Park	P	135	3120	54.6	382.6
	Paynes Fountain of Youth RV Pk	P	125	1220	15.2	106.5
	The Saratoga Inn	P	114	450	4.5	31.5
	Huckelberry Hot Springs	P, I	140	300	4.2	29.4
	Hobo Pool	P	118	120	3.0	21.0
	Jackson National Fish Hatchery	A	78	100	1.9	16.6
	Chief Washakie Plunge	P	111	150	2.0	13.6
	Cody Athletic Club	P	102	250	1.5	10.5
	Bronze Boot Spa	P	102	208	1.2	8.8
	DeMaris Hot Springs	P	97	400	1.0	7.0
	Astoria Mineral Hot Springs	P	104	100	1.0	6.6
	Auburn Hot Spring	P	144	37	0.8	5.7

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WY	Jackalope Plunge	P	86	800	0.4	2.7
	Frank Nixon Residence	P	118	35	0.3	2.1
	Steele Hot Springs	P	102	25	0.2	1.8
	Countryman Well	G, A	98	500	0.4	1.6
	Van Norman residence	S	124	0	0.0	0.6
	I-80 16th St. off ramp	I	47	0	0.9	
	East Grand St. Bridge	I	47	0	0.2	
			Total	16115	591.6	4140.7
			Grand Total	638261	5672.1	16945.7

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Table 4
Heat Pump Cooling Load Sites in the United States

08/23/88

STATE	SITE	MAJOR APPL. TYPE	RES. TEMP. (F)	CAPACITY (tons)	HEAT TO GROUND (billion Btu/y)	ENERGY SAVINGS (billion Btu/y)
AL	All of State	HP	67	690.0	18.2	0.3
AR	All of State	HP	63	6300.0	185.5	4.1
AZ	All of State	HP	62	300.0	9.3	0.2
CO	All of State	HP	52	600.0	5.6	0.2
DE	All of State	HP	57	1710.0	21.1	0.8
FL	All of State	HP	75	60000.0	1953.0	8.6
FL	Patrick Air Force Base	HP	72	3303.0	107.5	0.5
GA	All of State	HP	67	2040.0	41.1	0.6
IA	All of State	HP	52	1950.0	24.2	1.1
IL	All of State	HP	54	8400.0	143.2	5.7
IN	All of State	HP	54	15600.0	266.0	10.5
IN	Corporate Square	HP	55	350.0	6.0	0.2
KS	All of State	HP	57	600.0	12.1	0.4
KY	All of State	HP	59	7350.0	142.4	4.4
LA	All of State	HP	69	7500.0	244.1	2.7
MA	English High School	HP	55	35.0	0.4	0.0
MD	All of State	HP	57	3900.0	57.4	2.0
MI	All of State	HP	47	11250.0	139.5	7.7
MN	All of State	HP	45	3000.0	27.9	1.6
MO	All of State	HP	57	4500.0	90.7	3.2
MS	All of State	HP	67	300.0	7.9	0.1
MS	Mississippi Power Company	HP	69	89.0	2.5	0.0
MS	Commercial Buildings	HP	69	84.0	2.3	0.0
NB	All of State	HP	52	1950.0	24.2	1.1
NB	Homestead National Monument	HP	58	14.0	0.3	0.0
NC	All of State	HP	63	7650.0	106.7	2.6
ND	All of State	HP	42	1500.0	11.6	0.7
NJ	All of State	HP	55	1950.0	21.2	0.8
NV	Carlin & Wells High Schools	HP	87	171.0	1.8	0.0
NY	All of State	HP	47	932.0	8.6	0.5
NY	Sagamore Resort	HP	46	350.0	3.2	0.2
NY	East Middle Sch. & C.C.	HP	125	0.0	0.0	0.0
OH	All of State	HP	53	10800.0	167.4	7.0
OK	All of State	HP	62	90.0	2.4	0.1
OR	Thunderhead Lodge	HP	68	109.0	1.2	0.0
PA	All of State	HP	50	5700.0	92.8	4.5
PA	Factory	HP	52	80.0	1.4	0.1
SC	All of State	HP	67	5100.0	102.8	1.6
SD	All of State	HP	47	1125.0	15.7	0.9
TN	All of State	HP	61	1470.0	29.6	0.7
TX	All of State	HP	67	12150.0	268.9	4.1
UT	LDS Office Buildings	HP	60	2250.0	24.4	0.7
VA	All of State	HP	59	3000.0	44.2	1.4
WA	All of State	HP	70	2188.0	23.7	0.2
WI	All of State	HP	46	6000.0	65.1	3.7
			Grand Total	204430.0	4525.1	85.8

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APPENDIX

DESCRIPTIONS OF DIRECT USE SITES

Site No.: 1 Date Filed: 05/26/88
STATE: AK Updated:
SITE: Chena Hot Springs
LOCATION: 70 mi NE Fairbanks
APPLICATION TYPE: S, G, P
RESOURCE TEMP.: 135 F
MAX. FLOW: 222 gpm
THERMAL CAPACITY: 3.3 million Btu/h
ANNUAL ENERGY: 15.5 billion Btu/y
DESCRIPTION: Space heating a lodge and greenhouse and for swimming and therapeutic pools.

REFERENCE: Markle, 1979

Site No.: 2 Date Filed: 05/26/88
STATE: AK Updated:
SITE: Manley Hot Springs
LOCATION: Manley
APPLICATION TYPE: S, G, P
RESOURCE TEMP.: 138 F
MAX. FLOW: 175 gpm
THERMAL CAPACITY: 2.6 million Btu/h
ANNUAL ENERGY: 12.6 billion Btu/y
DESCRIPTION: Thermal spring used for space heating a residence, 72 ft x 120 ft greenhouse and public bath.

REFERENCE: Markle, 1979

Site No.: 3 Date Filed: 05/26/88
STATE: AK Updated:
SITE: Circle Hot Spring
LOCATION: 137 mi NE of Fairbanks
APPLICATION TYPE: S, G, P
RESOURCE TEMP.: 140 F
MAX. FLOW: 130 gpm
THERMAL CAPACITY: 2.3 million Btu/h
ANNUAL ENERGY: 11.0 billion Btu/y
DESCRIPTION: Thermal spring used for space heating a 22-room hotel, 13 cabins, swimming pool and greenhouse.

REFERENCE: Markle, 1979

Site No.: 4 Date Filed: 05/26/88
STATE: AK Updated:
SITE: Melozi
LOCATION: Yukon Region
APPLICATION TYPE: S, P
RESOURCE TEMP.: 131 F
MAX. FLOW: 130 gpm
THERMAL CAPACITY: 1.3 million Btu/h
ANNUAL ENERGY: 7.2 billion Btu/y
DESCRIPTION: Warm spring is used to heat a lodge, other buildings and an indoor swimming pool.

REFERENCE: Markle, 1979

Site No.: 5 Date Filed: 05/26/88
STATE: AK Updated:
SITE: Bell Island
LOCATION: 40 mi N. of Ketchikan
APPLICATION TYPE: S, P
RESOURCE TEMP.: 162 F
MAX. FLOW: 30 gpm
THERMAL CAPACITY: 0.5 million Btu/h
ANNUAL ENERGY: 2.5 billion Btu/y
DESCRIPTION: Thermal spring used to space heat a lodge, cabins, and swimming pool.

REFERENCE: Markle, 1979

Site No.: 6
STATE: AK
SITE: Tenakee
LOCATION: Chichigaf Island
APPLICATION TYPE: P
RESOURCE TEMP.: 109 F
MAX. FLOW: 22 gpm
THERMAL CAPACITY: 0.1 million Btu/h
ANNUAL ENERGY: 0.7 billion Btu/y
DESCRIPTION: Private bath house utilizes surface flow.

Date Filed: 05/26/88
Updated:

REFERENCE: Markle, 1979

Site No.: 7
STATE: AK
SITE: Goddard
LOCATION: 15 mi S of Sitka
APPLICATION TYPE: P
RESOURCE TEMP.: 153 F
MAX. FLOW: 13 gpm
THERMAL CAPACITY: 0.1 million Btu/h
ANNUAL ENERGY: 0.7 billion Btu/y
DESCRIPTION: Thermal spring used for bath house.

Date Filed: 05/26/88
Updated:

REFERENCE: Markle, 1979

Site No.: 8
STATE: AK
SITE: Baranof
LOCATION: 20 mi E of Sitka
APPLICATION TYPE: S, P
RESOURCE TEMP.: 151 F
MAX. FLOW: 100 gpm
THERMAL CAPACITY: 0.1 million Btu/h
ANNUAL ENERGY: 0.7 billion Btu/y
DESCRIPTION: Thermal spring used to space heat a residence and small bath house.

Date Filed: 05/26/88
Updated:

REFERENCE: Markle, 1979

Site No.: 9
STATE: AK
SITE: Ophir Creek
LOCATION: SW Region
APPLICATION TYPE: S
RESOURCE TEMP.: 145 F
MAX. FLOW: 225 gpm
THERMAL CAPACITY: 0.1 million Btu/h
ANNUAL ENERGY: 0.2 billion Btu/y
DESCRIPTION: Thermal spring used to space heat a residence.

Date Filed: 05/26/88
Updated:

REFERENCE: Markle, 1979

Site No.: 10
STATE: AL
SITE: All of State
LOCATION:
APPLICATION TYPE: HP
RESOURCE TEMP.: 67 F
MAX. FLOW: 1600 gpm
THERMAL CAPACITY: 8.3 million Btu/h
ANNUAL ENERGY: 7.3 billion Btu/y
DESCRIPTION: An estimated 200 ground water and 30 vertical earth coupled heat pumps are used for space heating and cooling. The reported annual energy is for the heating load only and in addition there are an estimated 60 horizontal earth coupled heat pumps not included.

Date Filed: 05/26/88
Updated:

REFERENCE: Schultz, 1988 & Kavanaugh, '88

Site No.: 11 Date Filed: 05/26/88
STATE: AR Updated:
SITE: All of State
LOCATION: Mainly Eastern Portion
APPLICATION TYPE: HP
RESOURCE TEMP.: 63 F
MAX. FLOW: 4800 gpm
THERMAL CAPACITY: 75.6 million Btu/h
ANNUAL ENERGY: 66.2 billion Btu/y
DESCRIPTION: An estimated 3000 ground water heat pump wells are used for space heating and cooling. These wells represent 20 percent ground water, 50 percent vertical earth coupled, and the remaining are horizontal earth coupled. The reported annual energy is only for the heating load.

REFERENCE: Fuggit, 1988; Ellis, 1988

Site No.: 12 Date Filed: 05/26/88
STATE: AR Updated:
SITE: Hot Springs National Park
LOCATION: Hot Springs
APPLICATION TYPE: S, P
RESOURCE TEMP.: 139 F
MAX. FLOW: 250 gpm
THERMAL CAPACITY: 1.2 million Btu/h
ANNUAL ENERGY: 6.9 billion Btu/y
DESCRIPTION: Space and water heating of administrative buildings, bathhouse, and one hotel.

REFERENCE: Crenshaw, 1988

Site No.: 13 Date Filed: 05/26/88
STATE: AZ Updated:
SITE: Hyder Valley
LOCATION:
APPLICATION TYPE: A
RESOURCE TEMP.: 105 F
MAX. FLOW: 4000 gpm
THERMAL CAPACITY: 40.0 million Btu/h
ANNUAL ENERGY: 140.2 billion Btu/y
DESCRIPTION: A new aquaculture facility is under construction. Species will be primarily telapia and catfish.

REFERENCE: Fitzsimmons, 1988

Site No.: 14 Date Filed: 05/26/88
STATE: AZ Updated:
SITE: Safford
LOCATION: Safford
APPLICATION TYPE: A
RESOURCE TEMP.: 105 F
MAX. FLOW: 1000 gpm
THERMAL CAPACITY: 10.0 million Btu/h
ANNUAL ENERGY: 35.0 billion Btu/y
DESCRIPTION: An aquaculture facility growing catfish. Utilizes one warm well (105 F; approx. 1,000 gpm) and one cool well (1,000 gpm)

REFERENCE: Fitzsimmons, 1988

Site No.: 15 Date Filed: 05/26/88
STATE: AZ Updated:
SITE: Near Tuscon
LOCATION: Near Tuscon
APPLICATION TYPE: A
RESOURCE TEMP.: 80 F
MAX. FLOW: 800 gpm
THERMAL CAPACITY: 8.0 million Btu/h
ANNUAL ENERGY: 28.0 billion Btu/y
DESCRIPTION: An aquaculture facility growing large-mouthed bass

REFERENCE: Fitzsimmons, 1988

Site No.: 16 Date Filed: 05/26/88
STATE: AZ Updated:
SITE: Hyder Valley
LOCATION: Between Gila Bend and Yuma
APPLICATION TYPE: A
RESOURCE TEMP.: 105 F
MAX. FLOW: 850 gpm
THERMAL CAPACITY: 7.0 million Btu/h
ANNUAL ENERGY: 24.5 billion Btu/y
DESCRIPTION: In the Hyder Valley six aquaculture facilities use 400-850 gpm each of 80-105 F geothermal water. Species grown are telapia, catfish and large mouth bass. Note: Annual use estimate based on a 0.4 utilization factor 85 F pond temp. Use is probably conservative.

REFERENCE: Fitzsimmons, 1988

Site No.: 17 Date Filed: 05/26/88
STATE: AZ Updated:
SITE: All of State
LOCATION:
APPLICATION TYPE: HP
RESOURCE TEMP.: 62 F
MAX. FLOW: 0 gpm
THERMAL CAPACITY: 3.6 million Btu/h
ANNUAL ENERGY: 3.2 billion Btu/y
DESCRIPTION: An estimated 100 vertical closed loop earth coupled heat pump wells are used for space heating and cooling.

REFERENCE: Ellis, 1988

Site No.: 18 Date Filed: 05/26/88
STATE: AZ Updated:
SITE: Castle Hot Springs
LOCATION: Near Wickenberg
APPLICATION TYPE: P
RESOURCE TEMP.: 131 F
MAX. FLOW: 340 gpm
THERMAL CAPACITY: 0.5 million Btu/h
ANNUAL ENERGY: 2.5 billion Btu/y
DESCRIPTION: An elegant old hot springs resort with a geothermal spring as a source for the large swimming pool. Once used by the Vanderbilts, Kennedys, etc., then donated to Arizona State University for a conference retreat. Recently sold to a private developer.

REFERENCE: Pasquelleti, 1988

Site No.: 19 Date Filed: 05/26/88
STATE: AZ Updated:
SITE: Buckhorn Mineral Wells
LOCATION: Mesa
APPLICATION TYPE: S, P
RESOURCE TEMP.: 140 F
MAX. FLOW: gpm
THERMAL CAPACITY: million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION: A historic old motel spa. Facilities include separate men's and women's departments, each with 12 individual rooms with tubs; massage, sweat-wrap therapy and motel rooms.

REFERENCE: Loam, 1985; Witcher, 1988

Site No.: 20 Date Filed: 05/26/88
STATE: AZ Updated:
SITE: Safford
LOCATION:
APPLICATION TYPE: P
RESOURCE TEMP.: 108 F
MAX. FLOW: gpm
THERMAL CAPACITY: million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION: Two facilities, Lebanon Baths and Kochina Springs. Spas offer full spa therapy services. Both are very small - only 4 hot tubs each. Possibly one other about the same size.

REFERENCE: Loam, 1985; Witcher, 1988

Site No.: 21 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Hot Creek Hatchery
LOCATION: Near Mammoth
APPLICATION TYPE: A
RESOURCE TEMP.: 61 F
MAX. FLOW: 18850 gpm
THERMAL CAPACITY: 25.6 million Btu/h
ANNUAL ENERGY: 201.7 billion Btu/y
DESCRIPTION: This California State fish hatchery uses water from springs at temperatures higher than local stream and most ground water for egg hatching and accelerated fish growth. Water from four spring areas at 61F, 58F, 54F and 52F are fed directly and mixed into raceways and hatcheries to maintain optimum temperature.

REFERENCE: Eichman, 1982

Site No.: 22 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Mammoth Lakes (under constr.)
LOCATION: Momo Co.
APPLICATION TYPE: DH
RESOURCE TEMP.: 300 F
MAX. FLOW: 650 gpm
THERMAL CAPACITY: 58.0 million Btu/h
ANNUAL ENERGY: 120.0 billion Btu/y
DESCRIPTION: Three test holes have been drilled which are indicative that temperatures of 300F or more are available in or near the city. A feasibility study of district heating has been completed. The California Energy Commission has awarded the city $3.75 million for construction of the project.

REFERENCE: Culver, 1988

Site No.: 23 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Litchfield Correctional Center
LOCATION: Near Susanville
APPLICATION TYPE: DH
RESOURCE TEMP.: 170 F
MAX. FLOW: 1250 gpm
THERMAL CAPACITY: 26.0 million Btu/h
ANNUAL ENERGY: 78.0 billion Btu/y
DESCRIPTION: Space heat and domestic hot water for the major portion of this prison is supplied by geothermal. Two wells are required. The facility converted to geothermal several years ago (1979) and recently underwent a major expansion.

REFERENCE: Culver, 1988

Site No.: 24 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Paso Robles Fish Farm
LOCATION: SanLuis Obispo Co
APPLICATION TYPE: A
RESOURCE TEMP.: 104 F
MAX. FLOW: 1000 gpm
THERMAL CAPACITY: 10.0 million Btu/h
ANNUAL ENERGY: 70.0 billion Btu/y
DESCRIPTION: This aquaculture project operated for a number of years, then closed due to problems after an owner's death. It has recently reopened.

REFERENCE: Butterfield, 1988

Site No.: 25 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Pacific Aqua Farms
LOCATION: Near Niland
APPLICATION TYPE: A
RESOURCE TEMP.: 140 F
MAX. FLOW: 650 gpm
THERMAL CAPACITY: 17.9 million Btu/h
ANNUAL ENERGY: 62.6 billion Btu/y
DESCRIPTION: Water from a geothermal well is utilized to maintain temperature for growing telapia in ponds at 85 F - utilization factor 0.4. Only source of water. Only problem is cooling it in summer. Has been in operation 6 years.

REFERENCE: Engler, 1988

Site No.: 26 Date Filed: 05/26/88
STATE: CA Updated:
SITE: San Bernardino District Htg
LOCATION: San Bernardino
APPLICATION TYPE: DH
RESOURCE TEMP.: 138 F
MAX. FLOW: 1425 gpm
THERMAL CAPACITY: 23.6 million Btu/h
ANNUAL ENERGY: 45.7 billion Btu/y
DESCRIPTION: This district heating system supplies heat and domestic water to city and state office buildings, apartments, hotels, sewage digester and several smaller uses. The system is very successful and is in almost constant expansion. A pipe line to a nearby airbase is contempleted, which will increase utilization significantly.

REFERENCE: Lienau, 1986

Site No.: 27 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Murrieta Hot Springs Resort
LOCATION: 12 mi. SE of Lake Elsinore
APPLICATION TYPE: P
RESOURCE TEMP.: 140 F
MAX. FLOW: 300 gpm
THERMAL CAPACITY: 8.3 million Btu/h
ANNUAL ENERGY: 43.6 billion Btu/y
DESCRIPTION: This old resort has recently been refurbished and is open to the public, offering swimming, spas, mud baths, restaurant and lodging. 40 spas, 20 mud baths, 3 pools, one olympic size. Very elaborate buildings and grounds. An old style hot springs resort.

REFERENCE: Culver, 1988

Site No.: 28 Date Filed: 07/20/88
STATE: CA Updated:
SITE: Arrowhead Fisheries
LOCATION: N.E. of Susanville
APPLICATION TYPE: A
RESOURCE TEMP.: 74 F
MAX. FLOW: 1570 gpm
THERMAL CAPACITY: 5.5 million Btu/h
ANNUAL ENERGY: 38.5 billion Btu/y
DESCRIPTION: Arrowhead Fisheries started raising sturgeon in 1986. They currently have 12 earthen raceways about 10 ft x 50 ft x 3 ft depth and 12 FRP tanks 8 ft x 20 ft x 2 ft depth. The company is currently constructing another site near Likely, CA that will be about 1.25 times as large with a flow of about 2250 gpm.

REFERENCE: Mackey, Phil, 1988

Site No.: 29 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Warner Springs Ranch (Resort)
LOCATION: 45 mi. NE of San Diego
APPLICATION TYPE: S, P
RESOURCE TEMP.: 137 F
MAX. FLOW: 130 gpm
THERMAL CAPACITY: 6.0 million Btu/h
ANNUAL ENERGY: 37.0 billion Btu/y
DESCRIPTION: A 2,500 acre resort. Two olympic size pools, rooms, restaurant, bar, shops, service station, golf course, air strip, glider port, tennis, stables, crafts, workshop and gymnasium. A group (2,000) owned resort.

REFERENCE: Loam, 1985

Site No.: 30 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Ramco Farms
LOCATION: Near Litchfield (Lassen Co.)
APPLICATION TYPE: G
RESOURCE TEMP.: 175 F
MAX. FLOW: 600 gpm
THERMAL CAPACITY: 13.0 million Btu/h
ANNUAL ENERGY: 29.5 billion Btu/y
DESCRIPTION: 3.56 acres of greenhouses are on the site - currently unused. They have been in operation, more or less continuously, since the late 1970's. There also is a binary power plant at the site. Geothermal fluid goes to the binary plant at 232F, then is cascaded to the greenhouses.

REFERENCE: Culver, 1988

Site No.: 31 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Bridgeport (under constr.)
LOCATION: Bridgeport, Mono Co.
APPLICATION TYPE: DH
RESOURCE TEMP.: 170 F
MAX. FLOW: 800 gpm
THERMAL CAPACITY: 13.0 million Btu/h
ANNUAL ENERGY: 27.0 billion Btu/y
DESCRIPTION: Production and injection wells have been drilled for a co-generation system using binary generators. All the pipeline and retrofit designs have been completed, but problems with the injection well developed. As soon as the well problem is solved, the project is expected to go forward. Funding is being provided by CEC.

REFERENCE: Culver, 1988

Site No.: 32 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Vichy Hot Springs
LOCATION: Near Ukiah
APPLICATION TYPE: S
RESOURCE TEMP.: 90 F
MAX. FLOW: 65 gpm
THERMAL CAPACITY: 0.1 million Btu/h
ANNUAL ENERGY: 26.4 billion Btu/y
DESCRIPTION: Capacity: 26,380. The spring is used primarily as a source for bottled mineral water. However, there is a kindergarden/day school set up in one of the old resort hotel buildings that is geothermally heated. At one time this was a well- known hot springs resort with several pools, hotel, guest houses, large dance hall, etc.

REFERENCE: Culver 88; Gilbert Aschoff 88

Site No.: 33 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Pan Hot Springs
LOCATION: San Bernardino Co (Big Bear)
APPLICATION TYPE: P
RESOURCE TEMP.: 90 F
MAX. FLOW: 0 gpm
THERMAL CAPACITY: 7.3 million Btu/h
ANNUAL ENERGY: 25.5 billion Btu/y
DESCRIPTION: Supplies two 75 ft x 40 ft commercial swimming pools. A fire in 1933 destroyed a 24-room hotel and large dance hall, but the pools are still used.

REFERENCE: CDMG, 1982

Site No.: 34 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Ft. Bidwell (Indian Res)
LOCATION: Ft. Bidwell
APPLICATION TYPE: S, A
RESOURCE TEMP.: 205 F
MAX. FLOW: 1500 gpm
THERMAL CAPACITY: 6.4 million Btu/h
ANNUAL ENERGY: 23.4 billion Btu/y
DESCRIPTION: There are 4 wells, ranging in temperature from 85F to 205F. Water is used for space heating and aquaculture. Currently a clinic, elders apt. house, community center, 3 staff houses and the gym are heated. A pipeline has been laid to 11 additional homes, but retrofit has not been completed. The aquaculture facility may be expanded, but additional cold water is needed.

REFERENCE: Degarmo, 1988

Site No.: 35 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Desert Hot Springs
LOCATION: Desert Hot Springs
APPLICATION TYPE: S, P
RESOURCE TEMP.: 200 F
MAX. FLOW: 350 gpm
THERMAL CAPACITY: 2.3 million Btu/h
ANNUAL ENERGY: 20.0 billion Btu/y
DESCRIPTION: An estimated 50 or more wells pump from 10 to 40 gpm of 120 to 200 F water for spa and pool heating and some domestic hot water heating and space heat. Spas and pools are by far the largest use. Actual flows and utilization are impossible to determine since much of the information is considered confidential.

REFERENCE: Culver, 1988

Site No.: 36 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Susanville District Heating
LOCATION: Susanville, CA
APPLICATION TYPE: DH
RESOURCE TEMP.: 170 F
MAX. FLOW: 750 gpm
THERMAL CAPACITY: 8.0 million Btu/h
ANNUAL ENERGY: 18.0 billion Btu/y
DESCRIPTION: A district heating system supplies heat to schools, public buildings, swimming pool, county and city shops, residences, etc. The system pumps 170 F geothermal water from one well to the applications where heat exchangers are installed with closed loop building systems. Geothermal discharge is about 130 F partially injected and partial to surface discharge. A new injection well will be drilled April ,1988, to take all the discharge.
REFERENCE: Culver, 1988

Site No.: 37 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Calistoga Private and Commer
LOCATION: Calistoga
APPLICATION TYPE: I, P, S
RESOURCE TEMP.: 275 F
MAX. FLOW: 105 gpm
THERMAL CAPACITY: 2.3 million Btu/h
ANNUAL ENERGY: 15.0 billion Btu/y
DESCRIPTION: At least 34 wells with temperatures over 100F are utilized by mineral water bottlers, spas, pools, mud baths and space heating of both commercial space and private residences. There is no accurate assessment of use, but the yearly flow is estimated to be well over 55 million

REFERENCE: CEC-'87; CDMG-'82; Culver-'88

Site No.: 38 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Nakashima Nurseries
LOCATION: Coachella
APPLICATION TYPE: G
RESOURCE TEMP.: 120 F
MAX. FLOW: 2000 gpm
THERMAL CAPACITY: 15.0 million Btu/h
ANNUAL ENERGY: 13.1 billion Btu/y
DESCRIPTION: These greenhouses are one of the largest cut roses producers in California.

REFERENCE: Lienau, 1986

Site No.: 39 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Modoc High School
LOCATION: Alturas
APPLICATION TYPE: S
RESOURCE TEMP.: 170 F
MAX. FLOW: 650 gpm
THERMAL CAPACITY: 5.2 million Btu/h
ANNUAL ENERGY: 13.0 billion Btu/y
DESCRIPTION: The school completed a well in April, 1988. Conversion of the buildings is to be completed by September, 1988. The project is funded by CEC.

REFERENCE: Culver, 1988

Site No.: 40 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Sycamore Hot Spring (Resort)
LOCATION: San Luis Obispo Co.
APPLICATION TYPE: P
RESOURCE TEMP.: 109 F
MAX. FLOW: 150 gpm
THERMAL CAPACITY: 2.2 million Btu/h
ANNUAL ENERGY: 13.0 billion Btu/y
DESCRIPTION: A resort has operated continuously since the late 1880's, using the water in a large pool, 50 spas, and for bathing. Natural gas, which is also produced, can hopefully be utilized. Another well will be drilled in April, 1988, for expansion of facilities.

REFERENCE: CDMG-'82; Culver-'88

Site No.: 41 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Aqua Caliente Springs Resort
LOCATION: Sonoma Co.
APPLICATION TYPE: P
RESOURCE TEMP.: 97 F
MAX. FLOW: 70 gpm
THERMAL CAPACITY: 1.4 million Btu/h
ANNUAL ENERGY: 12.0 billion Btu/y
DESCRIPTION: Three wells 300 ft deep supply water for a large pool in a day use resort. The resort has operated continuously since May 5, 1887. Waring (1915) reported the resort had a large hotel and cottages for about 300 people, but these have been demolished and removed.

REFERENCE: CDMG, 1982

Site No.: 42 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Konocti Harbor Inn
LOCATION: Near Kelseyville, Lake Co.
APPLICATION TYPE: P
RESOURCE TEMP.: 107 F
MAX. FLOW: 130 gpm
THERMAL CAPACITY: 1.6 million Btu/h
ANNUAL ENERGY: 11.0 billion Btu/y
DESCRIPTION: This large resort facility heats two 75 x 40 ft pools. There are additional wells at 125 F. At one time, additional utilization to reduce electrical consumption by 517,603 kwh/yr and propane use by 35,878 gal per yr was contemplated, but never done due to change of ownership.

REFERENCE: Culver, 1988

Site No.: 43 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Tsuji Nurseries
LOCATION: Susanville, CA
APPLICATION TYPE: G
RESOURCE TEMP.: 140 F
MAX. FLOW: 350 gpm
THERMAL CAPACITY: 4.8 million Btu/h
ANNUAL ENERGY: 9.2 billion Btu/y
DESCRIPTION: 1 1/2 acres of greenhouses produce carnations and roses for the cut flower market.

REFERENCE: Culver, 1988

Site No.: 44 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Fountain of Youth Spa
LOCATION: Niland
APPLICATION TYPE: P
RESOURCE TEMP.: 137 F
MAX. FLOW: 0 gpm
THERMAL CAPACITY: 1.2 million Btu/h
ANNUAL ENERGY: 8.4 billion Btu/y
DESCRIPTION: Two outdoor swimming pools and five outdoor hydro pools. Other services include massage, physical therapy, beauty and barber shops; doctor in residence, laundromat, store and RV hookups.

REFERENCE: Loam, 1985

Site No.: 45 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Lake Elsinore
LOCATION: Lake Elsinore
APPLICATION TYPE: P
RESOURCE TEMP.: 120 F
MAX. FLOW: 80 gpm
THERMAL CAPACITY: 1.2 million Btu/h
ANNUAL ENERGY: 8.4 billion Btu/y
DESCRIPTION: Several motels have spas, hot tubs and pools supplied with hot mineral water from wells. Temperatures range from 100 F to 120 F. Geothermal water is also used directly for showers and tubs in all the rooms.

REFERENCE: Culver, 1988 and Loam, 1985

Site No.: 46 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Glen Ivy Hot Springs (Resort)
LOCATION: Riverside Co
APPLICATION TYPE: P
RESOURCE TEMP.: 106 F
MAX. FLOW: 165 gpm
THERMAL CAPACITY: 1.2 million Btu/h
ANNUAL ENERGY: 8.0 billion Btu/y
DESCRIPTION: This day resort, once a large old resort, has been in operation since about 1870. The hotel and guest houses have been converted for residential use by the owners and employees. The day use facility consists of 2 pools, a large jacuzzi, 12 mineral baths and clay pool (similar to a large mud bath) and snack bar. All the pools and tubs use mineral water.

REFERENCE: Culver, 1988

Site No.: 47 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Calistoga District Heating
LOCATION: Calistoga
APPLICATION TYPE: DH
RESOURCE TEMP.: 223 F
MAX. FLOW: 500 gpm
THERMAL CAPACITY: 4.0 million Btu/h
ANNUAL ENERGY: 7.4 billion Btu/y
DESCRIPTION: Several feasibility studies have been completed and recently (1988) a production well has been obtained. Although it may be several years, a district heating system is almost sure to evolve.

REFERENCE: Culver, 1988

Site No.: 48 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Town of Tecopia
LOCATION: Near S. entr. to Death Valley
APPLICATION TYPE: P
RESOURCE TEMP.: 118 F
MAX. FLOW: 0 gpm
THERMAL CAPACITY: 1.0 million Btu/h
ANNUAL ENERGY: 7.0 billion Btu/y
DESCRIPTION: Four motels and trailer parks utilize geothermal to heat their swimming pools. Wells are artesian, ranging from 110 F to 118 F. Flows are unknown, but enough to not require chlorination. (approximately 1 turn over every 4 hours)

REFERENCE: Loam, 1985

Site No.: 49 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Kelly Hot Springs
LOCATION: Alturas
APPLICATION TYPE: A, G
RESOURCE TEMP.: 200 F
MAX. FLOW: 650 gpm
THERMAL CAPACITY: 0.8 million Btu/h
ANNUAL ENERGY: 6.6 billion Btu/y
DESCRIPTION: Current use is of the 88F water for growing catfish. A .2 acre greenhouse is not now in operation. The naturally flowing 200 F spring is mostly underutilized. The owner is investigating increasing the greenhouse and catfish or starting to raise exotic tropical fish.

REFERENCE: Culver, 1988

Site No.: 50 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Paraiso Hot Springs (Resort)
LOCATION: Monterey Co
APPLICATION TYPE: P
RESOURCE TEMP.: 115 F
MAX. FLOW: 700 gpm
THERMAL CAPACITY: 10.4 million Btu/h
ANNUAL ENERGY: 6.0 billion Btu/y
DESCRIPTION: This old resort (opened in late 1800's) has been refurbished. Geothermal water is used directly in 3 pools (one olympic-sized and two smaller) spas, and mineral baths and for showers. One flowing spring and one pumped well.

REFERENCE: Marge Perrine

Site No.: 51 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Tassajara Buddhist Meditation
LOCATION: Carmel Valley
APPLICATION TYPE: P
RESOURCE TEMP.: 110 F
MAX. FLOW: 152 gpm
THERMAL CAPACITY: 0.7 million Btu/h
ANNUAL ENERGY: 5.5 billion Btu/y
DESCRIPTION: Primarily a Buddhist Monostary with limited public accommodations. Rooms and meals with reservations; large meditation and swimming pools.

REFERENCE: Loam, 1985

Site No.: 52 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Furnace Creek Inn
LOCATION: Death Valley
APPLICATION TYPE: P
RESOURCE TEMP.: 89 F
MAX. FLOW: 350 gpm
THERMAL CAPACITY: 0.8 million Btu/h
ANNUAL ENERGY: 4.9 billion Btu/y
DESCRIPTION: Two swimming pools are heated by flow through at this hotel.

REFERENCE: Loam, 1985

Site No.: 53 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Avila Hot Springs
LOCATION: Near San Luis Obispo
APPLICATION TYPE: S, P
RESOURCE TEMP.: 131 F
MAX. FLOW: 50 gpm
THERMAL CAPACITY: 0.5 million Btu/h
ANNUAL ENERGY: 4.9 billion Btu/y
DESCRIPTION: Roman tubs and swimming pool, also used for some space heat and domestic hot water. Water produced from oil exploration well. Also produces natural gas, which is separated.

REFERENCE: HCDMG, 1982; Loam, 1985

Site No.: 54 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Furnace Creek Ranch
LOCATION: Death Valley
APPLICATION TYPE: P
RESOURCE TEMP.: 89 F
MAX. FLOW: 350 gpm
THERMAL CAPACITY: 0.8 million Btu/h
ANNUAL ENERGY: 4.9 billion Btu/y
DESCRIPTION: A large ranch style resort about 1 mile from Furnace Creek Inn. Uses water from the same spring (piped 1 mile). Larger than olympic pool is open to public (fee) as well as guests.

REFERENCE: Loam, 1985

Site No.: 55 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Cedarville Elem. & High School
LOCATION: Cedarville, CA
APPLICATION TYPE: S
RESOURCE TEMP.: 134 F
MAX. FLOW: 115 gpm
THERMAL CAPACITY: 1.4 million Btu/h
ANNUAL ENERGY: 4.8 billion Btu/y
DESCRIPTION: These two schools are supplied geothermal fluid from two separate wells. Water is used directly in both systems, and as DHW. The wells are relatively shallow and there apparently is considerable mixing of water as it nears the surface. At the high school earthquakes in Southern CA cause H2S smell of shower water to increase, sometimes so bad students didn't like to shower. Water from the elementary school is cascaded to the hospital.
REFERENCE: Culver, 1988

Site No.: 56 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Grover Hot Springs State Park
LOCATION: Alpine Co. (S of Lake Tahoe)
APPLICATION TYPE: P
RESOURCE TEMP.: 147 F
MAX. FLOW: 105 gpm
THERMAL CAPACITY: 0.6 million Btu/h
ANNUAL ENERGY: 4.7 billion Btu/y
DESCRIPTION: Large pool and soaking tubs adjoining Grover State Campground.

REFERENCE: Loam, 1985

Site No.: 57 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Wilbur Hot Springs
LOCATION: Near Clear Lake
APPLICATION TYPE: P
RESOURCE TEMP.: 152 F
MAX. FLOW: 30 gpm
THERMAL CAPACITY: 0.6 million Btu/h
ANNUAL ENERGY: 4.7 billion Btu/y
DESCRIPTION: Restored turn of the century hotel. Swim pool, soaking pools, rooms, etcs.

REFERENCE: Loam, 1985

Site No.: 58 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Campbell Hot Springs
LOCATION: Near Sierraville
APPLICATION TYPE: P
RESOURCE TEMP.: 115 F
MAX. FLOW: 80 gpm
THERMAL CAPACITY: 0.6 million Btu/h
ANNUAL ENERGY: 4.7 billion Btu/y
DESCRIPTION: An older 700 acre resort. Rooms, meals, massage, etc. Geothermal used in pool.

REFERENCE: Loam, 1985

Site No.: 59 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Whitmore Hot Springs
LOCATION: Near Bishop
APPLICATION TYPE: P
RESOURCE TEMP.: 95 F
MAX. FLOW: 400 gpm
THERMAL CAPACITY: 0.6 million Btu/h
ANNUAL ENERGY: 4.7 billion Btu/y
DESCRIPTION: A large public swimming pool operated jointly by Mono County and Los Angeles City Parks & Receation Department.

REFERENCE: Loam, 1985; Culver, 1988

Site No.: 60 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Harbin Hot Springs
LOCATION: Near Middletown
APPLICATION TYPE: P
RESOURCE TEMP.: 120 F
MAX. FLOW: 53 gpm
THERMAL CAPACITY: 0.6 million Btu/h
ANNUAL ENERGY: 4.7 billion Btu/y
DESCRIPTION: A large historical resort. Rooms, conference center, restaurant. State accredited massage school. Geothermal use is swimming pool heating.

REFERENCE: Loam, 1985

Site No.: 61 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Indian Springs School
LOCATION: Big Bend (Plumas Co)
APPLICATION TYPE: S
RESOURCE TEMP.: 127 F
MAX. FLOW: 300 gpm
THERMAL CAPACITY: 2.0 million Btu/h
ANNUAL ENERGY: 4.5 billion Btu/y
DESCRIPTION: This complex consists of a school with large indoor pool, superintendent house and teacher's duplex. The well is 800 ft deep and is artesian, but requires pumping for high loads in cold weather. Discharge is to surface.

REFERENCE: Culver,1986; Chitwood, 1988

Site No.: 62 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Esalen Institute
LOCATION: Near Big Sur
APPLICATION TYPE: P
RESOURCE TEMP.: 120 F
MAX. FLOW: 75 gpm
THERMAL CAPACITY: 0.6 million Btu/h
ANNUAL ENERGY: 4.4 billion Btu/y
DESCRIPTION: Primarilly an educational/experiential center. Also, seminars and workshops. Room and board to public is available. Large indoor and outdoor soaking tubs available to public at night and weekends for nominal charge.

REFERENCE: Loam, 1985

Site No.: 63 Date Filed: 05/26/88
STATE: CA Updated:
SITE: California Hot Springs
LOCATION: Northeast of Bakersfield
APPLICATION TYPE: P
RESOURCE TEMP.: 126 F
MAX. FLOW: 50 gpm
THERMAL CAPACITY: 0.7 million Btu/h
ANNUAL ENERGY: 4.3 billion Btu/y
DESCRIPTION: A recently restored historic resort. Large swimming pools, restaurant, shops, lodging.

REFERENCE: Loam, 1985

Site No.: 64 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Calisoga High School
LOCATION: Calistoga
APPLICATION TYPE: S
RESOURCE TEMP.: 200 F
MAX. FLOW: 50 gpm
THERMAL CAPACITY: 3.0 million Btu/h
ANNUAL ENERGY: 3.9 billion Btu/y
DESCRIPTION: The school has been using a down hole heat exchanger for space heating of one wing for the past 5 years. Peak load of 150,000 Btu/hr. Construction of a new school which will be entirely geothermally heated, including domestic hot water and showers, will start during late summer of 1988. The load of 3 million Btu/hr is an estimate for the new school.

REFERENCE: Culver, 1988

Site No.: 65 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Keough Hot Springs
LOCATION: 10 mi. S. of Bishop, Inyo Co.
APPLICATION TYPE: P
RESOURCE TEMP.: 128 F
MAX. FLOW: 528 gpm
THERMAL CAPACITY: 0.5 million Btu/h
ANNUAL ENERGY: 3.9 billion Btu/y
DESCRIPTION: An older hot springs resort with swimming pool. The bathhouses (tubs) are closed. Food and RV hookups available.

REFERENCE: CDMG, 1982; Loam, 1985

Site No.: 66 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Palm Springs Spa
LOCATION: Palm Springs
APPLICATION TYPE: P
RESOURCE TEMP.: 106 F
MAX. FLOW: 35 gpm
THERMAL CAPACITY: 0.5 million Btu/h
ANNUAL ENERGY: 3.5 billion Btu/y
DESCRIPTION: Originally the site of an indian village and still owned by the Aqua Caliente Tribe, as is all of the land in Palm Springs. Springs supply water for pools and spas in a large deluxe resort.

REFERENCE: CDMG, 1982; Loam, 1985

Site No.: 67 Date Filed: 05/26/88
STATE: CA Updated:
SITE: La Vide Mineral Springs
LOCATION: Brea
APPLICATION TYPE: P
RESOURCE TEMP.: 120 F
MAX. FLOW: 50 gpm
THERMAL CAPACITY: 0.5 million Btu/h
ANNUAL ENERGY: 3.0 billion Btu/y
DESCRIPTION: Outdoor swimming pool and hydro pool. Separate men's and women's mineral baths, with 16 sunken tubs each. Massages, motel rooms, cafe and bar.

REFERENCE: Loam, 1985

Site No.: 68 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Orr Hot Springs
LOCATION: Near Ukiah
APPLICATION TYPE: P
RESOURCE TEMP.: 103 F
MAX. FLOW: 30 gpm
THERMAL CAPACITY: 0.4 million Btu/h
ANNUAL ENERGY: 2.8 billion Btu/y
DESCRIPTION: An old small resort. Several cottages, dorm rooms and common kitchen. Geothermal water used in swimming pools and hot tubs.

REFERENCE: Loam, 1985; Culver, 1988

Site No.: 69 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Bashfords Hot Mineral Spa
LOCATION: Niland
APPLICATION TYPE: P
RESOURCE TEMP.: 145 F
MAX. FLOW: 0 gpm
THERMAL CAPACITY: 0.4 million Btu/h
ANNUAL ENERGY: 2.8 billion Btu/y
DESCRIPTION: Outdoor swimming pool, outdoor hydropool, 6 soaking tubs, RV hookups, store, etc.

REFERENCE: Loam, 1985

Site No.: 70 Date Filed: 05/26/88
STATE: CA Updated:
SITE: White Suphur Springs
LOCATION: Plumas Co.
APPLICATION TYPE: S, P
RESOURCE TEMP.: 85 F
MAX. FLOW: 39 gpm
THERMAL CAPACITY: 0.4 million Btu/h
ANNUAL ENERGY: 2.7 billion Btu/y
DESCRIPTION: Flow from several springs is collected and piped to the pool and a radiant floor slab in the bed and breakfast inn. There are several other guest cottages, but these are not heated.

REFERENCE: Culver, 1988

Site No.: 71 Date Filed: 05/26/88
STATE: CA Updated:
SITE: San Luis Bay Estates
LOCATION: San Luis Obispo Co
APPLICATION TYPE: P
RESOURCE TEMP.: 106 F
MAX. FLOW: 60 gpm
THERMAL CAPACITY: 0.5 million Btu/h
ANNUAL ENERGY: 2.6 billion Btu/y
DESCRIPTION: This resort utilizes the geothermal water for heating an olympic-sized pool and directly as domestic hot water. They will drill another well during April, 1988, (1300 ft) to expand utilization to hot tubs and whirlpool spas.

REFERENCE: Butterfield, 1988

Site No.: 72 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Surprise Valley Hospial
LOCATION: Cedarville
APPLICATION TYPE: P
RESOURCE TEMP.: 108 F
MAX. FLOW: 43 gpm
THERMAL CAPACITY: 0.7 million Btu/h
ANNUAL ENERGY: 2.2 billion Btu/y
DESCRIPTION: Geothermal is cascaded from the elementary school and used for heating domestic hot water and make up air pre heat which is a major load in a hospital.

REFERENCE: Culver, 1988; Chitwood, 1988

Site No.: 73 Date Filed: 05/26/88
STATE: CA Updated:
SITE: LDS Church
LOCATION: Susanville
APPLICATION TYPE: S
RESOURCE TEMP.: 128 F
MAX. FLOW: 90 gpm
THERMAL CAPACITY: 0.9 million Btu/h
ANNUAL ENERGY: 2.0 billion Btu/y
DESCRIPTION: This 20,000 sq. ft. complex has been heated for a number of years. The well is 450 ft. deep. Discharge is to surface disposal, but there is some consideraton of not permitting the discharge in the future. The church is investigating the options of injection or hookup to the city system.

REFERENCE: Culver, 1988

Site No.: 74 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Shoshone Motel & Trailer Park
LOCATION: Near So. entrance of Death Va.
APPLICATION TYPE: S
RESOURCE TEMP.: 93 F
MAX. FLOW: 200 gpm
THERMAL CAPACITY: 0.3 million Btu/h
ANNUAL ENERGY: 1.9 billion Btu/y
DESCRIPTION: An older resort. Swimming pool is also open to public for fee.

REFERENCE: Loam, 1985

Site No.: 75 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Aqua Caliente County Park
LOCATION: Santa Rosa Mtn. Wilderness
APPLICATION TYPE: P
RESOURCE TEMP.: 90 F
MAX. FLOW: 0 gpm
THERMAL CAPACITY: 0.3 million Btu/h
ANNUAL ENERGY: 1.8 billion Btu/y
DESCRIPTION: A county-operated desert campground with outdoor swimming pool, large indoor hydro pool and roman tubs. Available to the public as well as those staying in the park.

REFERENCE: Loam, 1985

Site No.: 76 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Drakesbad Guest Ranch
LOCATION: Lassen National Park
APPLICATION TYPE: P
RESOURCE TEMP.: 180 F
MAX. FLOW: 20 gpm
THERMAL CAPACITY: 0.5 million Btu/h
ANNUAL ENERGY: 1.4 billion Btu/y
DESCRIPTION: Spring water at about 180 F is mixed with cool spring water to supply a pool (30 x 60). The use has continued since the late 1800's. Since the formation of the park in the 1950's the facility has been operated under lease from the park service. No other facilities at the guest ranch are heated.

REFERENCE: Vance, 1985

Site No.: 77 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Imperial Sea View Hot Springs
LOCATION: Near Niland
APPLICATION TYPE: P
RESOURCE TEMP.: 165 F
MAX. FLOW: 0 gpm
THERMAL CAPACITY: 0.2 million Btu/h
ANNUAL ENERGY: 1.2 billion Btu/y
DESCRIPTION: Seven outdoor pools approximately 15 ft. diameter, RV hookups, store and mobile home rentals.

REFERENCE: Loam, 1985

Site No.: 78 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Mono Hot Springs
LOCATION: 80 mi NE of Fresno
APPLICATION TYPE: P
RESOURCE TEMP.: 107 F
MAX. FLOW: 53 gpm
THERMAL CAPACITY: 0.2 million Btu/h
ANNUAL ENERGY: 1.0 billion Btu/y
DESCRIPTION: A commercial bath house with indoor (pvt.) and outdoor tubs.

REFERENCE: Loam, 1985

Site No.: 79 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Indian Valley Hospital
LOCATION: Greenville
APPLICATION TYPE: S
RESOURCE TEMP.: 117 F
MAX. FLOW: 285 gpm
THERMAL CAPACITY: 0.5 million Btu/h
ANNUAL ENERGY: 0.9 billion Btu/y
DESCRIPTION: This small hospital complex was heated by electricity. A heat pump system was designed and installed, but failed to meet public health dept. standards. A re-design eleminating the heat pumps and using heat exchangers is under construction.

REFERENCE: Rafferty, 1988

Site No.: 80 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Matilija Hot Springs
LOCATION: Ventura Co
APPLICATION TYPE: P
RESOURCE TEMP.: 109 F
MAX. FLOW: 75 gpm
THERMAL CAPACITY: 0.1 million Btu/h
ANNUAL ENERGY: 0.7 billion Btu/y
DESCRIPTION: Current (1981) public county park use is for spas, jacuzzi, pools and bathing. A swimming pool at the site does not use the water because it becomes cloudy with chlorination. The resource is underutilized.

REFERENCE: CDMG, 1982

Site No.: 81 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Democrat Hot Springs Resort
LOCATION: Kern Co
APPLICATION TYPE: P
RESOURCE TEMP.: 102 F
MAX. FLOW: 15 gpm
THERMAL CAPACITY: 0.8 million Btu/h
ANNUAL ENERGY: 0.7 billion Btu/y
DESCRIPTION: Once the site of a hotel having accommodations for 100 people. Now a private recreation association resort with a few cabins. Geothermal water is used in the pool.

REFERENCE: CDMG, 1982

Site No.: 82 Date Filed: 05/26/88
STATE: CA Updated:
SITE: San Juan Hot Springs
LOCATION: near San Juan Capistrano
APPLICATION TYPE: P
RESOURCE TEMP.: 125 F
MAX. FLOW: 20 gpm
THERMAL CAPACITY: 0.1 million Btu/h
ANNUAL ENERGY: 0.6 billion Btu/y
DESCRIPTION: Sixteen outdoor tubs (widely spaced), locker rooms and overnight camping.

REFERENCE: Loam, 1985

Site No.: 83 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Big Bend Preventorium
LOCATION: Big Bend
APPLICATION TYPE: G, P
RESOURCE TEMP.: 180 F
MAX. FLOW: 90 gpm
THERMAL CAPACITY: 0.1 million Btu/h
ANNUAL ENERGY: 0.4 billion Btu/y
DESCRIPTION: An old historical resort now rehabilitated and operated by the co-op Essene Community. Natural springs supply mineral tubs and pools. Cabins, massages, RV park, seminars. Greenhouse for vegetables.

REFERENCE: Loam, 1985

Site No.: 84 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Lake Elsinore Dist. Heating
LOCATION: Lake Elsinore, CA
APPLICATION TYPE: DH
RESOURCE TEMP.: 134 F
MAX. FLOW: 500 gpm
THERMAL CAPACITY: 0.3 million Btu/h
ANNUAL ENERGY: 0.2 billion Btu/y
DESCRIPTION: The only load on the district heating system at the present time is the community center, presently (1988) undergoing rehabilitation. There are plans to connect the library and sheriff's office, which are nearby, in the near future. The system has the capacity to support more heat load, but current low price of fuel has slowed development.

REFERENCE: Culver, 1988

Site No.: 85 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Aqua Farms International
LOCATION: Near Meeca
APPLICATION TYPE: A
RESOURCE TEMP.: 92 F
MAX. FLOW: 1500 gpm
THERMAL CAPACITY: 3.7 million Btu/h
ANNUAL ENERGY: 0.2 billion Btu/y
DESCRIPTION: Fifty one acre ponds for growing fish. Five wells, 100-350 ft. deep. Originally shrimp were grown, but now several varieties of fish are grown.

REFERENCE: Grajcier, 1988

Site No.: 86 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Jacumba Hot Springs Health Spa
LOCATION: 80 mi E. of San Diego
APPLICATION TYPE: P
RESOURCE TEMP.: 97 F
MAX. FLOW: 15 gpm
THERMAL CAPACITY: 0.0 million Btu/h
ANNUAL ENERGY: 0.1 billion Btu/y
DESCRIPTION: An older motel, spa, rooms, restaurant, bar and sauna.

REFERENCE: Loam, 1985

Site No.: 87 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Lake County Ag Park
LOCATION: Lake Co.
APPLICATION TYPE: G
RESOURCE TEMP.: 152 F
MAX. FLOW: 400 gpm
THERMAL CAPACITY: 0.3 million Btu/h
ANNUAL ENERGY: 0.0 billion Btu/y
DESCRIPTION: This ag park was developed by the county and the initial greenhouse (7,000 sq. ft.) put up by Mendocino Community College as a teaching facility. The county hopes to induce commercial growers to locate there, selling them energy and leasing space.

REFERENCE: Dillinger, 1988

Site No.: 88 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Saline Valley Hot Springs
LOCATION: Near Olancha in Inyo, Co.
APPLICATION TYPE: P
RESOURCE TEMP.: 107 F
MAX. FLOW: gpm
THERMAL CAPACITY: million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION: This is a non-commercial area developed and maintained by local volunteers. It is significant since the fairly extensive series of cement pools and tubs are often so crowded there is no more space available for soaking.

REFERENCE: Loam, 1985

Site No.: 89 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Reds Meadow Hot Springs
LOCATION: Devils Postpile Natl Monument
APPLICATION TYPE: P
RESOURCE TEMP.: 115 F
MAX. FLOW: 15 gpm
THERMAL CAPACITY: million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION: Tubs and showers at a U.S. Forest Service Campground

REFERENCE: Loam, 1985

Site No.: 90 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Miracle Hot Spring
LOCATION: N.E. of Bakersfield
APPLICATION TYPE: S, P
RESOURCE TEMP.: 122 F
MAX. FLOW: 15 gpm
THERMAL CAPACITY: million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION: This spring is the location of a USFS leased trailer and RV park. Geothermal water is used for bathing, several open spa tubs and in the small general store and restroom/bathhouse.

REFERENCE: Loam, 1985

Site No.: 91 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Arrowhead Hot Springs
LOCATION: 8 mi. N.E. of San Bernardino
APPLICATION TYPE: S, P
RESOURCE TEMP.: 190 F
MAX. FLOW: 500 gpm
THERMAL CAPACITY: million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION: This old resort hotel is currently being retrofit to use geothermal from an artesian well. The pool retrofit has been completed and work is underway on the hotel. Heat loads can be determined when work is further along.

REFERENCE: Fisher, 1988; Culbertson, 1988

Site No.: 92 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Twenty-Nine Palms (City of)
LOCATION: San Bernardino Co
APPLICATION TYPE: S, P
RESOURCE TEMP.: 140 F
MAX. FLOW: gpm
THERMAL CAPACITY: million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION: Numerous private wells supply DHW, a few pools and some space heating.

REFERENCE: CDMG, 1982

Site No.: 93 Date Filed: 05/26/88
STATE: CA Updated:
SITE: California Pines
LOCATION: Modoc Co.
APPLICATION TYPE: DHW
RESOURCE TEMP.: 100 F
MAX. FLOW: gpm
THERMAL CAPACITY: million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION: The well test pumped at nearly 100 F, but with the small pump installed the production temperature is only 76 F, indicating mixing in the well. The water is now used only as domestic water supply.

REFERENCE: Davenport, 1988

Site No.: 94 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Hot Creek
LOCATION: Near Mammoth Lakes
APPLICATION TYPE: P
RESOURCE TEMP.: 200 F
MAX. FLOW: 4000 gpm
THERMAL CAPACITY: million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION: This is a non-commercial area, but its constant use for swimming and soaking, especially in winter by skiers, make it deserve mention. The hot springs heat the creek water in a large area. There are also several smaller springs with natural improved tubs used by small groups.

REFERENCE: Loam, 1985; Culver, 1988

Site No.: 95 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Tecopia Hot Springs
LOCATION: Inyo Co.
APPLICATION TYPE: S, P
RESOURCE TEMP.: 108 F
MAX. FLOW: 200 gpm
THERMAL CAPACITY: million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION: Water is used in a county park facility with bath houses, a community center and campground.

REFERENCE: CDMG, 1982

Site No.: 96 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Fales Hot Springs
LOCATION:
APPLICATION TYPE: S, P
RESOURCE TEMP.: 142 F
MAX. FLOW: 300 gpm
THERMAL CAPACITY: million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION: As of 1981, a ski resort was being developed. Geothermal is to be used for a pool, spas and perhaps space and DHW heating.

REFERENCE: CDMG, 1982

Site No.: 97 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Modesto Memorial Hospital
LOCATION: Modesto
APPLICATION TYPE: S
RESOURCE TEMP.: 78 F
MAX. FLOW: 905 gpm
THERMAL CAPACITY: 5.0 million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION: Low temperature water is used in preheat and cooling coils of single duct system. During parts of the year this provides the total required heating for the 200 bed hospital. Disposal to another well.

REFERENCE: Lewis, 1988

Site No.: 98 Date Filed: 05/26/88
STATE: CA Updated:
SITE: Nevares Springs
LOCATION: Inyo Co. at Death Valley (VC)
APPLICATION TYPE: DHW
RESOURCE TEMP.: 104 F
MAX. FLOW: gpm
THERMAL CAPACITY: million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION: Water is used as domestic hot water in National Park Service buildings, employee residences, and at the visitors center.

REFERENCE: Loam, 1985

Site No.: 99 Date Filed: 05/26/88
STATE: CO Updated:
SITE: Sand Dunes Hot Spring
LOCATION: Hooper
APPLICATION TYPE: A
RESOURCE TEMP.: 118 F
MAX. FLOW: 500 gpm
THERMAL CAPACITY: 13.3 million Btu/h
ANNUAL ENERGY: 81.2 billion Btu/y
DESCRIPTION: Wholesale fish farm. Catfish in tanks and ponds. This was in operation during the early 1980's, but was not confirmed in 1988. It is believed to be still operating.

REFERENCE: Loam, 1985

Site No.: 100 Date Filed: 05/26/88
STATE: CO Updated:
SITE: Glenwood Hot Springs Hotel
LOCATION: Glenwood
APPLICATION TYPE: P, S
RESOURCE TEMP.: 130 F
MAX. FLOW: 2263 gpm
THERMAL CAPACITY: 9.0 million Btu/h
ANNUAL ENERGY: 63.4 billion Btu/y
DESCRIPTION: Very large resort with two huge swimming pools, soaking pool, saunas, etc. Billed as the largest geothermally heated pool in the world. The largest spring in CO feeds the pools, floor radiant heat in the large bathhouse, space heat in the motel and domestic hot water for showers and laundry.

REFERENCE: Loam, 1980; Rold, 1988

Site No.: 101 Date Filed: 05/26/88
STATE: CO Updated:
SITE: Roaring Judy Fish Hatchery
LOCATION: 20 mi NE of Gunnison
APPLICATION TYPE: A
RESOURCE TEMP.: 65 F
MAX. FLOW: 1100 gpm
THERMAL CAPACITY: 7.1 million Btu/h
ANNUAL ENERGY: 62.6 billion Btu/y
DESCRIPTION: Two wells about 600 ft deep provide warm water, which is mixed with creek water, to provide optimum hatching and growing conditions for trout.

REFERENCE: Rold, 1988

Site No.: 102 Date Filed: 05/26/88
STATE: CO Updated:
SITE: Pagosa Springs District Htg.
LOCATION: Pagosa Springs
APPLICATION TYPE: DH
RESOURCE TEMP.: 149 F
MAX. FLOW: 800 gpm
THERMAL CAPACITY: 3.6 million Btu/h
ANNUAL ENERGY: 35.5 billion Btu/y
DESCRIPTION: Currently heating 11 buildings; 6 commercial, 3 schools, townhall, church, and a portion of the county courthouse. System utilizes plate HX and closed loop. Library heating planned. A USDOE PON project.

REFERENCE: Rafferty, 1988

Site No.: 103 Date Filed: 05/26/88
STATE: CO Updated:
SITE: Jones Splashland
LOCATION: Alamosa
APPLICATION TYPE: P
RESOURCE TEMP.: 106 F
MAX. FLOW: 310 gpm
THERMAL CAPACITY: 2.8 million Btu/h
ANNUAL ENERGY: 19.0 billion Btu/y
DESCRIPTION: Large community plunge - maintained at 87-88 F

REFERENCE: Loam, 1980

Site No.: 104 Date Filed: 05/26/88
STATE: CO Updated:
SITE: The Spa Motel
LOCATION: Pagosa Springs
APPLICATION TYPE: S, P
RESOURCE TEMP.: 123 F
MAX. FLOW: 220 gpm
THERMAL CAPACITY: 2.7 million Btu/h
ANNUAL ENERGY: 14.1 billion Btu/y
DESCRIPTION: Motel with large flow-through outdoor pool and two indoor soaking pools. Space heating preheats water for laundry.

REFERENCE: Martinez, 1988

Site No.: 105 Date Filed: 05/26/88
STATE: CO Updated:
SITE: Pagosa Springs Private Wells
LOCATION: Pagosa Springs
APPLICATION TYPE: S
RESOURCE TEMP.: 120 F
MAX. FLOW: 675 gpm
THERMAL CAPACITY: 5.0 million Btu/h
ANNUAL ENERGY: 13.0 billion Btu/y
DESCRIPTION: Several private well owners utilize geothermal for space and domestic water heating of businesses and homes.

REFERENCE: Martinez, 1988

Site No.: 106 Date Filed: 05/26/88
STATE: CO Updated:
SITE: Waunita Hot Springs Ranch
LOCATION: Near Gunnison
APPLICATION TYPE: S, G, P
RESOURCE TEMP.: 175 F
MAX. FLOW: 100 gpm
THERMAL CAPACITY: 2.5 million Btu/h
ANNUAL ENERGY: 13.0 billion Btu/y
DESCRIPTION: Large outdoor pools and space and domestic water heating in the two-story lodge building, (20,000 sq ft.); also a greenhouse.

REFERENCE: Rold, 1988; Pringle, 1988

Site No.: 107 Date Filed: 05/26/88
STATE: CO Updated:
SITE: All of State
LOCATION:
APPLICATION TYPE: HP
RESOURCE TEMP.: 52 F
MAX. FLOW: 0 gpm
THERMAL CAPACITY: 7.2 million Btu/h
ANNUAL ENERGY: 12.6 billion Btu/y
DESCRIPTION: An estimated 200 vertical closed loop earth coupled heat pump wells are used for space heating and cooling.

REFERENCE: Ellis, 1988

Site No.: 108 Date Filed: 05/26/88
STATE: CO Updated:
SITE: Steamboat Springs Health & Rec
LOCATION: Steamboat Springs
APPLICATION TYPE: P
RESOURCE TEMP.: 104 F
MAX. FLOW: 140 gpm
THERMAL CAPACITY: 1.7 million Btu/h
ANNUAL ENERGY: 11.8 billion Btu/y
DESCRIPTION: Large outdoor pool, enclosed soaking pool, saunas. Owned and operated by a public association. Heart Springs is the source of water and heat.

REFERENCE: Loam, 1980; Rold, 1988

Site No.: 109 Date Filed: 05/26/88
STATE: CO Updated:
SITE: Ouray Municipal Pool
LOCATION: Ouray
APPLICATION TYPE: S, P
RESOURCE TEMP.: 156 F
MAX. FLOW: 180 gpm
THERMAL CAPACITY: 1.4 million Btu/h
ANNUAL ENERGY: 9.6 billion Btu/y
DESCRIPTION: A large municipal outdoor pool. Recently domestic hot water and space heating the pool building using a plate heat exchanger.

REFERENCE: Culver, 1988

Site No.: 110 Date Filed: 05/26/88
STATE: CO Updated:
SITE: Old Wright Well
LOCATION: Mount Princeton
APPLICATION TYPE: G
RESOURCE TEMP.: 160 F
MAX. FLOW: 120 gpm
THERMAL CAPACITY: 1.6 million Btu/h
ANNUAL ENERGY: 7.2 billion Btu/y
DESCRIPTION: A new well was drilled to 160 ft. and a 0.5 acre new greenhouse constructed at the site of an old greenhouse.

REFERENCE: Rold, 1988

Site No.: 111 Date Filed: 05/26/88
STATE: CO Updated:
SITE: Jump Steady Resort
LOCATION: Buena Vista
APPLICATION TYPE: S, P
RESOURCE TEMP.: 119 F
MAX. FLOW: 90 gpm
THERMAL CAPACITY: 1.0 million Btu/h
ANNUAL ENERGY: 7.0 billion Btu/y
DESCRIPTION: A smaller resort, with outdoor swimming pool, soaking pools and tubs. Water piped to all rooms for showers and private tubs. Also, at least two nearby homes are heated using water from the springs.

REFERENCE: Loam, 1980; Rold, 1988

Site No.: 112 Date Filed: 05/26/88
STATE: CO Updated:
SITE: Cottonwood Hot Springs
LOCATION: West of Buena Vista
APPLICATION TYPE: S
RESOURCE TEMP.: 119 F
MAX. FLOW: 10 gpm
THERMAL CAPACITY: 0.2 million Btu/h
ANNUAL ENERGY: 6.3 billion Btu/y
DESCRIPTION: Four homes are heated utilizing the springs.

REFERENCE: Rold, 1988

Site No.: 113 Date Filed: 05/26/88
STATE: CO Updated:
SITE: Valley View Hot Springs
LOCATION: Near Villa Grove
APPLICATION TYPE: P
RESOURCE TEMP.: 99 F
MAX. FLOW: 180 gpm
THERMAL CAPACITY: 0.8 million Btu/h
ANNUAL ENERGY: 5.7 billion Btu/y
DESCRIPTION: Two large outdoor pools, seven soaking pools, sauna. A membership resort.

REFERENCE: Loam, 1980; Rold, 1988

Site No.: 114 Date Filed: 05/26/88
STATE: CO Updated:
SITE: 4 UR Guest Ranch
LOCATION: Creede in Mineral Co.
APPLICATION TYPE: P
RESOURCE TEMP.: 135 F
MAX. FLOW: 50 gpm
THERMAL CAPACITY: 0.8 million Btu/h
ANNUAL ENERGY: 5.3 billion Btu/y
DESCRIPTION: Deluxe guest ranch with large outdoor flow-through swimming pool and indoor jet pools.

REFERENCE: Loam, 1980; Rold, 1988

Site No.: 115 Date Filed: 05/26/88
STATE: CO Updated:
SITE: Salida Hot Springs(Poncha Spr)
LOCATION: Salida
APPLICATION TYPE: S, P
RESOURCE TEMP.: 160 F
MAX. FLOW: 200 gpm
THERMAL CAPACITY: 0.8 million Btu/h
ANNUAL ENERGY: 4.9 billion Btu/y
DESCRIPTION: Municipal plunge with large pools indoors. Outdoor soaking pools and indoor tubs. Space heating of the plunge and 8-10 apartments. Although the Poncha springs flow at 200 gpm, only 76 gpm is utilized. Also heats caretaker's house.

REFERENCE: Rold, 1988

Site No.: 116 Date Filed: 05/26/88
STATE: CO Updated:
SITE: Hot Sulphur Springs
LOCATION: Hot Sulphur Springs
APPLICATION TYPE: S, P
RESOURCE TEMP.: 111 F
MAX. FLOW: 60 gpm
THERMAL CAPACITY: 0.7 million Btu/h
ANNUAL ENERGY: 4.9 billion Btu/y
DESCRIPTION: Large outdoor swimming pool, indoor soaking pools, space heating and laundry. Water from 5-10 springs is collected and piped to the facility.

REFERENCE: Loam, 1980; Rold, 1988

Site No.: 117 Date Filed: 05/26/88
STATE: CO Updated:
SITE: Indian Springs Resort
LOCATION: Idaho Springs
APPLICATION TYPE: P
RESOURCE TEMP.: 115 F
MAX. FLOW: 60 gpm
THERMAL CAPACITY: 0.8 million Btu/h
ANNUAL ENERGY: 4.3 billion Btu/y
DESCRIPTION: Large indoor swimming pool, large soaking pools and private tubs. A large older, but well maintained resort. Rooms, restaurant, etc. One shallow well producing 30 gpm and springs at 115 F. The flows from three springs are collected and used.

REFERENCE: Loam, 1980; Rold, 1988

Site No.: 118 Date Filed: 05/26/88
STATE: CO Updated:
SITE: Wiesbaden Motel & Health Res.
LOCATION: Ouray
APPLICATION TYPE: S, P
RESOURCE TEMP.: 117 F
MAX. FLOW: 60 gpm
THERMAL CAPACITY: 0.7 million Btu/h
ANNUAL ENERGY: 3.8 billion Btu/y
DESCRIPTION: Outdoor pool, indoor soaking pool, saunas and space heating the entire facility.

REFERENCE: Huttrer, 1988

Site No.: 119 Date Filed: 05/26/88
STATE: CO Updated:
SITE: Pinkerton Hot Springs
LOCATION: La Plata Co. in SW CO
APPLICATION TYPE: S, P
RESOURCE TEMP.: 93 F
MAX. FLOW: 77 gpm
THERMAL CAPACITY: 0.3 million Btu/h
ANNUAL ENERGY: 2.1 billion Btu/y
DESCRIPTION: The Golden Horseshoe Resort at one time heated a pool and some space heating. The resort is thought to be still operating, but this is unverified.

REFERENCE: Rold, 1988

Site No.: 120 Date Filed: 05/26/88
STATE: CO Updated:
SITE: Mount Princeton Hot Springs
LOCATION: Mount Princeton
APPLICATION TYPE: P, DHW
RESOURCE TEMP.: 132 F
MAX. FLOW: 175 gpm
THERMAL CAPACITY: 0.4 million Btu/h
ANNUAL ENERGY: 1.8 billion Btu/y
DESCRIPTION: A large modern resort with large outdoor swimming pool and soaking pools and indoor tubs. Used directly as domestic hot water. No space heating - closed in winter.

REFERENCE: Loam, 1980; Rold, 1988

Site No.: 121
STATE: CO
SITE: Twin Peaks Motel
LOCATION: Ouray
APPLICATION TYPE: S, P
RESOURCE TEMP.: 110 F
MAX. FLOW: 15 gpm
THERMAL CAPACITY: 0.2 million Btu/h
ANNUAL ENERGY: 1.1 billion Btu/y
DESCRIPTION: Used directly for space heating and heating a small swimming pool

Date Filed: 05/26/88
Updated:

REFERENCE: Huttrer, 1988

Site No.: 122
STATE: CO
SITE: Box Canyon Motel
LOCATION: Ouray
APPLICATION TYPE: S, P
RESOURCE TEMP.: 110 F
MAX. FLOW: 15 gpm
THERMAL CAPACITY: 0.2 million Btu/h
ANNUAL ENERGY: 1.1 billion Btu/y
DESCRIPTION: Used directly for space heating of a portion of the motel and for soaking tubs.

Date Filed: 05/26/88
Updated:

REFERENCE: Huttrer, 1988

Site No.: 123
STATE: CO
SITE: Mount Princeton Area
LOCATION: Mount Princeton
APPLICATION TYPE: S, P
RESOURCE TEMP.: 132 F
MAX. FLOW: gpm
THERMAL CAPACITY: 0.3 million Btu/h
ANNUAL ENERGY: 0.6 billion Btu/y
DESCRIPTION: In the Mount Princeton area there are several applications in additon to the Mount Princeton Hot Springs Resort. A church group operates Young Life Camp, Woolmington Resort heats at least a pool,using a well and there are at least 2 homes and 2 motel pools heated. At the present, time little is known except they do exist.

Date Filed: 05/26/88
Updated:

REFERENCE: Rold, 1988

Site No.: 124
STATE: CO
SITE: Health Spa
LOCATION: Glenwood Springs
APPLICATION TYPE: S, P
RESOURCE TEMP.: 114 F
MAX. FLOW: 6 gpm
THERMAL CAPACITY: 0.1 million Btu/h
ANNUAL ENERGY: 0.4 billion Btu/y
DESCRIPTION: Primarily a massage and chiropractic establishment. Space heating and hot spring water for the baths is provided by a spring under the front porch, called Graves Spring.

Date Filed: 05/26/88
Updated:

REFERENCE: Rold, 1988

Site No.: 125
STATE: CO
SITE: Lope Hot Springs
LOCATION: Ridgeway
APPLICATION TYPE: P
RESOURCE TEMP.: 132 F
MAX. FLOW: 20 gpm
THERMAL CAPACITY: 0.1 million Btu/h
ANNUAL ENERGY: 0.4 billion Btu/y
DESCRIPTION: A small hydrotherapy center.

Date Filed: 05/26/88
Updated:

REFERENCE:

Site No.: 126 Date Filed: 05/26/88
STATE: CO Updated:
SITE: Cement Creek Ranch
LOCATION: Crested Butte N. of Gunnison
APPLICATION TYPE: P
RESOURCE TEMP.: 78 F
MAX. FLOW: 70 gpm
THERMAL CAPACITY: 0.1 million Btu/h
ANNUAL ENERGY: 0.4 billion Btu/y
DESCRIPTION: Flow through pool at guest ranch.

REFERENCE: Loam, 1980; Rold, 1988

Site No.: 127 Date Filed: 05/26/88
STATE: CO Updated:
SITE: Dunton Hot Springs
LOCATION: Near Dolores
APPLICATION TYPE: P
RESOURCE TEMP.: 107 F
MAX. FLOW: 25 gpm
THERMAL CAPACITY: 0.1 million Btu/h
ANNUAL ENERGY: 0.3 billion Btu/y
DESCRIPTION: Smaller old resort. Indoor soaking tubs.

REFERENCE: Loam, 1980; Rold, 1988

Site No.: 128 Date Filed: 05/26/88
STATE: CO Updated:
SITE: Trip Hot Springs
LOCATION: LaPlata in SW Colorado
APPLICATION TYPE: G, P
RESOURCE TEMP.: 111 F
MAX. FLOW: gpm
THERMAL CAPACITY: million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION: There may be a small greenhouse, some buildings and a pool heated using spring water. These may actually be at Pinkerton Hot Springs.

REFERENCE: Rold,

Site No.: 129 Date Filed: 05/26/88
STATE: CO Updated:
SITE: Glenwood Springs Vapor Caves
LOCATION: Glenwood
APPLICATION TYPE: P
RESOURCE TEMP.: F
MAX. FLOW: gpm
THERMAL CAPACITY: million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION: Cares with water and steam used as steam baths (separate mens and womens). No estimate of the beneficial heat provided was made.

REFERENCE: Loam, 1980; Rold, 1988

Site No.: 130 Date Filed: 05/26/88
STATE: CO Updated:
SITE: Ouray District Heating
LOCATION: Ouray
APPLICATION TYPE: DH
RESOURCE TEMP.: 156 F
MAX. FLOW: 780 gpm
THERMAL CAPACITY: million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION: A district heating system is being developed. To date 6 wells have been drilled, four with useable temperatures and flows, and the 156 F spring will be utilized.

REFERENCE: Huttrer, 1988

Site No.: 131 Date Filed: 05/26/88
STATE: CO Updated:
SITE: Canon City Area
LOCATION: Canon City
APPLICATION TYPE: S
RESOURCE TEMP.: F
MAX. FLOW: gpm
THERMAL CAPACITY: million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION: Heating of a new prison was proposed and the prison was built to permit easy retrofit. To date, the resource has not been confirmed at the prision and wells have not been drilled. The heating of homes and pools in the area has been rumored, but not been confirmed - nor is it definately known there are not.

REFERENCE: Rold, 1988

Site No.: 132 Date Filed: 05/26/88
STATE: DE Updated:
SITE: All of State
LOCATION:
APPLICATION TYPE: HP
RESOURCE TEMP.: 57 F
MAX. FLOW: 4000 gpm
THERMAL CAPACITY: 20.5 million Btu/h
ANNUAL ENERGY: 35.9 billion Btu/y
DESCRIPTION: An estimated 500 ground water and 70 vertical closed loop earth coupled heat pump wells are used for space heating.

REFERENCE: Ellis, 1988

Site No.: 133 Date Filed: 05/26/88
STATE: FL Updated:
SITE: All of State
LOCATION: Mainly Southern
APPLICATION TYPE: HP
RESOURCE TEMP.: 75 F
MAX. FLOW: 160000 gpm
THERMAL CAPACITY: 800.0 million Btu/h
ANNUAL ENERGY: 700.8 billion Btu/y
DESCRIPTION: An estimated 20,000 heat pump wells are used for space heating and cooling. In Brevard County there are 16,000 wells pumping 180 million gpd and in Volusia county, 1,500 wells are pumping 6.2 million gpd and it is estimated that one in every five homes use a heat pump well. Approximately 2 percent of these wells are vertical closed loop earth coupled heat pumps.

REFERENCE: McCray, 1988

Site No.: 134 Date Filed: 05/26/88
STATE: FL Updated:
SITE: Patrick Air Force Base
LOCATION: Melbourne
APPLICATION TYPE: HP
RESOURCE TEMP.: 72 F
MAX. FLOW: 8000 gpm
THERMAL CAPACITY: 39.6 million Btu/h
ANNUAL ENERGY: 138.8 billion Btu/y
DESCRIPTION: A district heating and cooling system provided by groundwater-source heat pumps using 38 production and injection wells in a loop. This system realized a large savings after converting from electric cooling.

REFERENCE: Frazee, 1988

Site No.: 135 Date Filed: 05/26/88
STATE: GA Updated:
SITE: All of State
LOCATION: Southern Part Mainly
APPLICATION TYPE: HP
RESOURCE TEMP.: 67 F
MAX. FLOW: 4800 gpm
THERMAL CAPACITY: 24.5 million Btu/h
ANNUAL ENERGY: 21.4 billion Btu/y
DESCRIPTION: An estimated 600 ground water and 80 vertical closed loop earth coupled heat pump wells are used for space heating and cooling. The reported annual energy is for heating load only.

REFERENCE: McLemore, 1988 & Ellis, 1988

Site No.: 136 Date Filed: 05/26/88
STATE: GA Updated:
SITE: Roosevelt Warm Springs Inst.
LOCATION: Warm Springs
APPLICATION TYPE: S, HP, P
RESOURCE TEMP.: 88 F
MAX. FLOW: 800 gpm
THERMAL CAPACITY: 1.1 million Btu/h
ANNUAL ENERGY: 3.4 billion Btu/y
DESCRIPTION: Space and water heating by direct use and heat pump, 200 gpm are uused to heat swimming and therapy pools.

REFERENCE: Aiken, 1988

Site No.: 137 Date Filed: 05/26/88
STATE: HI Updated:
SITE: Community Geothermal Tech Prog
LOCATION: HGPA Well
APPLICATION TYPE: I
RESOURCE TEMP.: 347 F
MAX. FLOW: 110 gpm
THERMAL CAPACITY: million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION: Hawaii's Community Geothermal Program, initiated in 1986, has installed five direct use projects which utilize the water fraction from the HGPA well separator. The projects involve: 1) drying the local koa wood in a kiln, 2) using low-pressure steam in a cloth dyeing process, 3) a greenhouse to sprout decorative palm trees and increase the growth rate, 4) dehydrate tropical fruit to produce papaya powder, and 5) mixing silica with other local compounds to produce a Hawaiian glass.
REFERENCE: Woodruff, 1988

Site No.: 138 Date Filed: 05/26/88
STATE: IA Updated:
SITE: All of State
LOCATION:
APPLICATION TYPE: HP
RESOURCE TEMP.: 52 F
MAX. FLOW: 2400 gpm
THERMAL CAPACITY: 23.4 million Btu/h
ANNUAL ENERGY: 41.0 billion Btu/y
DESCRIPTION: An estimated 300 ground water and 350 vertical earth coupled heat pump wells are used for space heating and cooling.

REFERENCE: Ellis, 1988

Site No.: 139 Date Filed: 05/26/88
STATE: ID Updated:
SITE: Fish Breeders of Idaho
LOCATION: Buhl
APPLICATION TYPE: A
RESOURCE TEMP.: 90 F
MAX. FLOW: 6200 gpm
THERMAL CAPACITY: 24.8 million Btu/h
ANNUAL ENERGY: 174.0 billion Btu/y
DESCRIPTION: Fish Breeders of Idaho, Inc. has been raising channel catfish in high-density concrete raceways for over ten years. The water comes from artesian geothermal wells and cold water from streams cool the water to 82 F, the best production temperature.

REFERENCE: Lund, 1987

Site No.: 140 Date Filed: 05/26/88
STATE: ID Updated:
SITE: Boise City Geo. Dist. Heating
LOCATION: Boise
APPLICATION TYPE: DH
RESOURCE TEMP.: 170 F
MAX. FLOW: 700 gpm
THERMAL CAPACITY: 17.5 million Btu/h
ANNUAL ENERGY: 42.8 billion Btu/y
DESCRIPTION: The system presently services about 150,000 sq. ft. of office buildings. The Boise City system includes three production wells and disposal is to a river. The project includes 18,000 ft of insulated supply and 23,000 ft of uninsulated disposal piping capable of delivering 4,000 gallons per minute, or equivalent of 2.2 million therms in a heating season.

REFERENCE: Lunis, 1987

Site No.: 141 Date Filed: 05/26/88
STATE: ID Updated:
SITE: Idaho Capitol Mall
LOCATION: Boise
APPLICATION TYPE: DH
RESOURCE TEMP.: 162 F
MAX. FLOW: 750 gpm
THERMAL CAPACITY: 15.8 million Btu/h
ANNUAL ENERGY: 31.7 billion Btu/y
DESCRIPTION: The Idaho Capitol Mall consists of seven state office buildings, including the capitol.

REFERENCE: Lienau, 1984

Site No.: 142 Date Filed: 05/26/88
STATE: ID Updated:
SITE: Warm Spgs. Water District
LOCATION: Boise
APPLICATION TYPE: DH
RESOURCE TEMP.: 170 F
MAX. FLOW: 700 gpm
THERMAL CAPACITY: 12.3 million Btu/h
ANNUAL ENERGY: 30.0 billion Btu/y
DESCRIPTION: The Boise Warm Springs Water District (BWSWD) provides space heating to 250 homes. Two wells were drilled in 1890 to a depth of 400 ft and this venture eventually became the Boise Warm Springs Hot water District. In the 1930's hot water was provided to approximately 400 residences, small commercial businesses, and the world famous Natatorium. A major refurbishing of the Warm Springs pipeline system was completed in the early 1980's.
REFERENCE: Lunis, 1987

Site No.: 143 Date Filed: 05/26/88
STATE: ID Updated:
SITE: Lava Hot Springs
LOCATION: Bannock County
APPLICATION TYPE: S, P
RESOURCE TEMP.: 112 F
MAX. FLOW: 1800 gpm
THERMAL CAPACITY: 3.0 million Btu/h
ANNUAL ENERGY: 20.2 billion Btu/y
DESCRIPTION: The Lava Springs Foundation, state operated, uses the thermal water for an olympic-size swimming pool (uses a shell and tube heat exchanger), two whirlpools and for space heating a building. In addition, one hotel uses geothermal for space heating and five homes are heated with ground water heat pumps.

REFERENCE: Keller, 1988

Site No.: 144 Date Filed: 05/26/88
STATE: ID Updated:
SITE: Flint Greenhouses
LOCATION: Buhl
APPLICATION TYPE: G
RESOURCE TEMP.: 112 F
MAX. FLOW: 570 gpm
THERMAL CAPACITY: 9.1 million Btu/h
ANNUAL ENERGY: 19.9 billion Btu/y
DESCRIPTION: The 93,000 sq ft greenhouse raises potted blooming plants, including 29 varities of chrysanthemums. Additional greenhouses, warehouse and packaging facility constructed in 1987

REFERENCE: Street, 1985; Culver, 1988

Site No.: 145 Date Filed: 05/26/88
STATE: ID Updated:
SITE: College of Southern Idaho
LOCATION: Twin Falls
APPLICATION TYPE: HP
RESOURCE TEMP.: 102 F
MAX. FLOW: 1220 gpm
THERMAL CAPACITY: 8.2 million Btu/h
ANNUAL ENERGY: 18.0 billion Btu/y
DESCRIPTION: Artesian well provides space heating for three campus buildings using a water-to-water heat pump.

REFERENCE: Kenkermath, 1985

Site No.: 146 Date Filed: 05/26/88
STATE: ID Updated:
SITE: Cal Flint Floral
LOCATION: Buhl
APPLICATION TYPE: G
RESOURCE TEMP.: 160 F
MAX. FLOW: 490 gpm
THERMAL CAPACITY: 7.5 million Btu/h
ANNUAL ENERGY: 16.4 billion Btu/y
DESCRIPTION: The 76,125 sq ft greenhouse raises potted blooming plants for all seasons. Located at Buhl specifically for using geothermal.

REFERENCE: Street, 1985

Site No.: 147 Date Filed: 05/26/88
STATE: ID Updated:
SITE: M&L Greenhouses
LOCATION: Buhl
APPLICATION TYPE: G
RESOURCE TEMP.: 112 F
MAX. FLOW: 460 gpm
THERMAL CAPACITY: 7.4 million Btu/h
ANNUAL ENERGY: 16.2 billion Btu/y
DESCRIPTION: Two wells supply geothermal water that heats 75,000 sq ft of greenhouse that raises 130 varieties of bedding and potted plants.

REFERENCE: Street, 1985

Site No.: 148 Date Filed: 05/26/88
STATE: ID Updated:
SITE: Jack Ward Greenhouses
LOCATION: Garden Valley
APPLICATION TYPE: G
RESOURCE TEMP.: 138 F
MAX. FLOW: 390 gpm
THERMAL CAPACITY: 6.9 million Btu/h
ANNUAL ENERGY: 15.1 billion Btu/y
DESCRIPTION: Thermal springs, one mile from the greenhouses, are used to heat 70,000 sq ft with PVC pipes buried in the ground.

REFERENCE: Street, 1985

Site No.: 149 Date Filed: 05/26/88
STATE: ID Updated:
SITE: Lunty Tropical Fish
LOCATION: Buhl
APPLICATION TYPE: A
RESOURCE TEMP.: 90 F
MAX. FLOW: 400 gpm
THERMAL CAPACITY: 2.0 million Btu/h
ANNUAL ENERGY: 14.0 billion Btu/y
DESCRIPTION: Robert Lunty uses thermal water for raising tropical fish

REFERENCE: Kenkermath, 1985

Site No.: 150 Date Filed: 05/26/88
STATE: ID Updated:
SITE: Warm Springs Greenhouses
LOCATION: Banks
APPLICATION TYPE: G, S
RESOURCE TEMP.: 180 F
MAX. FLOW: 240 gpm
THERMAL CAPACITY: 6.0 million Btu/h
ANNUAL ENERGY: 13.1 billion Btu/y
DESCRIPTION: The 60,250 sq ft of greenhouses are heated from hot springs. After the water is used in the greenhouse it heats two homes.

REFERENCE: Street, 1985

Site No.: 151 Date Filed: 05/26/88
STATE: ID Updated:
SITE: Fort Boise Veteran's Hospital
LOCATION: Boise
APPLICATION TYPE: S
RESOURCE TEMP.: 162 F
MAX. FLOW: 300 gpm
THERMAL CAPACITY: 6.0 million Btu/h
ANNUAL ENERGY: 12.1 billion Btu/y
DESCRIPTION: Space and DHW heating are provided by two geothermal wells for central hospital and several service bulidings.

REFERENCE: Lunis, 1987

Site No.: 152 Date Filed: 05/26/88
STATE: ID Updated:
SITE: Schutz's Hot Spring
LOCATION: Crouch
APPLICATION TYPE: S, P
RESOURCE TEMP.: 176 F
MAX. FLOW: 600 gpm
THERMAL CAPACITY: 3.2 million Btu/h
ANNUAL ENERGY: 10.8 billion Btu/y
DESCRIPTION: Thermal spring is used to heat an olympic-sized swimming pool, tennis courts, fire station, maintenance garage for a logging company, and five residential buildings.

REFERENCE: McClain, 1979

Site No.: 153 Date Filed: 05/26/88
STATE: ID Updated:
SITE: Edward's Greenhouses
LOCATION: Boise
APPLICATION TYPE: G
RESOURCE TEMP.: 117 F
MAX. FLOW: 265 gpm
THERMAL CAPACITY: 4.9 million Btu/h
ANNUAL ENERGY: 10.7 billion Btu/y
DESCRIPTION: Edward's greenhouses are the oldest commercial greenhouses in the state to heat with geothermal. Approximately 20,000 sq ft are under glass and 30,000 sq ft use polyethylene.

REFERENCE: Street, 1985

Site No.: 154 Date Filed: 05/26/88
STATE: ID Updated:
SITE: Bald Mountain Hot Springs
LOCATION: Ketchum
APPLICATION TYPE: P
RESOURCE TEMP.: 168 F
MAX. FLOW: 2 gpm
THERMAL CAPACITY: 2.8 million Btu/h
ANNUAL ENERGY: 10.0 billion Btu/y
DESCRIPTION: Themal water from Guyer Hot Springs heats olympic-sized swimming pool and an outdoor soaking pool.

REFERENCE: Loam, 1980

Site No.: 155 Date Filed: 05/26/88
STATE: ID Updated:
SITE: Crook's Greenhouse
LOCATION: Caksia County
APPLICATION TYPE: G
RESOURCE TEMP.: 194 F
MAX. FLOW: 140 gpm
THERMAL CAPACITY: 4.0 million Btu/h
ANNUAL ENERGY: 9.0 billion Btu/y
DESCRIPTION: Thermal water from a shallow well used to heat a greenhouse.

REFERENCE: Kenkermath, 1985

Site No.: 156 Date Filed: 05/26/88
STATE: ID Updated:
SITE: Sligar's Thousand Springs Res.
LOCATION: Hagerman
APPLICATION TYPE: P
RESOURCE TEMP.: 200 F
MAX. FLOW: 140 gpm
THERMAL CAPACITY: 1.3 million Btu/h
ANNUAL ENERGY: 7.7 billion Btu/y
DESCRIPTION: Thermal springs heats large outdoor swimming pool and 17 jet pools.

REFERENCE: Loam, 1980

Site No.: 157 Date Filed: 05/26/88
STATE: ID Updated:
SITE: Hunt Brothers Floral
LOCATION: Boise
APPLICATION TYPE: G, S
RESOURCE TEMP.: 117 F
MAX. FLOW: 200 gpm
THERMAL CAPACITY: 3.0 million Btu/h
ANNUAL ENERGY: 6.6 billion Btu/y
DESCRIPTION: Hunt uses geothermal for space heating and irrigation, the only operator to do this; the others use cold water sources. Geothermal is used to heat his home and for bathing.

REFERENCE: Street, 1985

Site No.: 158 Date Filed: 05/26/88
STATE: ID Updated:
SITE: Ketchum District Heating
LOCATION: Ketchum
APPLICATION TYPE: DH
RESOURCE TEMP.: 158 F
MAX. FLOW: 1027 gpm
THERMAL CAPACITY: 3.0 million Btu/h
ANNUAL ENERGY: 6.6 billion Btu/y
DESCRIPTION: An artesian well provides space and DHW to about 60 residences, a commercial building and a resort. A 30-unit condo is planned.

REFERENCE: Dellinger, 1982

Site No.: 159 Date Filed: 05/26/88
STATE: ID Updated:
SITE: Jim's Hot Springs
LOCATION: New Meadows
APPLICATION TYPE: P
RESOURCE TEMP.: 151 F
MAX. FLOW: 60 gpm
THERMAL CAPACITY: 0.8 million Btu/h
ANNUAL ENERGY: 5.3 billion Btu/y
DESCRIPTION: Thermal spring heats an outdoor swimming pool and soaking pool.

REFERENCE: Loam, 1980

Site No.: 160 Date Filed: 05/26/88
STATE: ID Updated:
SITE: Heise Hot Springs
LOCATION: Ririe
APPLICATION TYPE: P
RESOURCE TEMP.: 120 F
MAX. FLOW: 80 gpm
THERMAL CAPACITY: 1.0 million Btu/h
ANNUAL ENERGY: 4.4 billion Btu/y
DESCRIPTION: Two outdoor swimming pools use municipal water, geothermally heated.

REFERENCE: Loam, 1980

Site No.: 161 Date Filed: 05/26/88
STATE: ID Updated:
SITE: Bliss Greenhouse
LOCATION: Bliss
APPLICATION TYPE: G, S, A
RESOURCE TEMP.: 151 F
MAX. FLOW: 60 gpm
THERMAL CAPACITY: 1.2 million Btu/h
ANNUAL ENERGY: 3.7 billion Btu/y
DESCRIPTION: Geothermal heat is used in greenhouse, fish ponds, residence, personal swimming pool, and walkways exposed to snow.

REFERENCE: Loam, 1980

Site No.: 162 Date Filed: 05/26/88
STATE: ID Updated:
SITE: Silver Creek Plunge
LOCATION: Garden Valley
APPLICATION TYPE: P
RESOURCE TEMP.: 101 F
MAX. FLOW: 110 gpm
THERMAL CAPACITY: 0.9 million Btu/h
ANNUAL ENERGY: 3.6 billion Btu/y
DESCRIPTION: Thermal spring heats outdoor swimming pool.

REFERENCE: Loam, 1980

Site No.: 163 Date Filed: 05/26/88
STATE: ID Updated:
SITE: Haven Lodge
LOCATION: Lowman
APPLICATION TYPE: P
RESOURCE TEMP.: 148 F
MAX. FLOW: 50 gpm
THERMAL CAPACITY: 0.5 million Btu/h
ANNUAL ENERGY: 3.5 billion Btu/y
DESCRIPTION: Thermal spring heats outdoor swimming pool.

REFERENCE: Loam, 1980

Site No.: 164 Date Filed: 05/26/88
STATE: ID Updated:
SITE: Warm Springs Resort
LOCATION: Idaho City
APPLICATION TYPE: P
RESOURCE TEMP.: 110 F
MAX. FLOW: 100 gpm
THERMAL CAPACITY: 0.9 million Btu/h
ANNUAL ENERGY: 3.2 billion Btu/y
DESCRIPTION: Thermal spring heats rural plunge.

REFERENCE: Loam, 1980

Site No.: 165 Date Filed: 05/26/88
STATE: ID Updated:
SITE: Donlay Ranch Hot Spring
LOCATION: Boise County
APPLICATION TYPE: G
RESOURCE TEMP.: 130 F
MAX. FLOW: 72 gpm
THERMAL CAPACITY: 1.2 million Btu/h
ANNUAL ENERGY: 3.2 billion Btu/y
DESCRIPTION: Thermal spring used for heating a small greenhouse.

REFERENCE: McClain, 1979

Site No.: 166 Date Filed: 05/26/88
STATE: ID Updated:
SITE: Miracle Hot Springs
LOCATION: Buhl
APPLICATION TYPE: S, P
RESOURCE TEMP.: 139 F
MAX. FLOW: 50 gpm
THERMAL CAPACITY: 0.7 million Btu/h
ANNUAL ENERGY: 2.9 billion Btu/y
DESCRIPTION: Thermal spring heats outdoor swimming pool and 15 enclosed soaking pools. All buildings and dressing rooms are heated with geothermal.

REFERENCE: Loam, 1980

Site No.: 167 Date Filed: 05/26/88
STATE: ID Updated:
SITE: Downatta Hot Springs
LOCATION: Downey
APPLICATION TYPE: P
RESOURCE TEMP.: 112 F
MAX. FLOW: 80 gpm
THERMAL CAPACITY: 0.6 million Btu/h
ANNUAL ENERGY: 2.5 billion Btu/y
DESCRIPTION: Thermal spring heats outdoor swimming pool and six outdoor hot tubs.

REFERENCE: Loam, 1980

Site No.: 168 Date Filed: 05/26/88
STATE: ID Updated:
SITE: Banbury Hot Springs
LOCATION: Buhl
APPLICATION TYPE: S, P
RESOURCE TEMP.: 131 F
MAX. FLOW: 80 gpm
THERMAL CAPACITY: 0.8 million Btu/h
ANNUAL ENERGY: 2.3 billion Btu/y
DESCRIPTION: Thermal spring heats outdoor swimming pool, locker rooms, and several buidings.

REFERENCE: Loam, 1980

Site No.: 169 Date Filed: 05/26/88
STATE: ID Updated:
SITE: Robinson Bar
LOCATION: Clayton
APPLICATION TYPE: P
RESOURCE TEMP.: 135 F
MAX. FLOW: 40 gpm
THERMAL CAPACITY: 0.6 million Btu/h
ANNUAL ENERGY: 2.3 billion Btu/y
DESCRIPTION: Thermal spring heats an outdoor swimming pool and soaking pool.

REFERENCE: Loam, 1980

Site No.: 170 Date Filed: 05/26/88
STATE: ID Updated:
SITE: Challis Hot Springs
LOCATION: Challis
APPLICATION TYPE: P
RESOURCE TEMP.: 127 F
MAX. FLOW: 40 gpm
THERMAL CAPACITY: 0.5 million Btu/h
ANNUAL ENERGY: 2.2 billion Btu/y
DESCRIPTION: Thermal spring heats swimming pool.

REFERENCE: Loam, 1980

Site No.: 171
STATE: ID
SITE: Indian Springs Natatorium
LOCATION: American Falls
APPLICATION TYPE: P
RESOURCE TEMP.: 90 F
MAX. FLOW: 120 gpm
THERMAL CAPACITY: 0.6 million Btu/h
ANNUAL ENERGY: 2.1 billion Btu/y
DESCRIPTION: Thermal spring heats outdoor swimming pool.

Date Filed: 05/26/88
Updated:

REFERENCE: Loam, 1988

Site No.: 172
STATE: ID
SITE: Green Canyon Hot Springs
LOCATION: Newdale
APPLICATION TYPE: G, P
RESOURCE TEMP.: 118 F
MAX. FLOW: 80 gpm
THERMAL CAPACITY: 0.6 million Btu/h
ANNUAL ENERGY: 2.0 billion Btu/y
DESCRIPTION: Thermal spring heats indoor swimming pool. Geothermal greenhouse produce hydroponic tomatoes and cucumbers.

Date Filed: 05/26/88
Updated:

REFERENCE: Loam, 1980

Site No.: 173
STATE: ID
SITE: Bear Lake Hot Springs
LOCATION: St. Charles
APPLICATION TYPE: P
RESOURCE TEMP.: 115 F
MAX. FLOW: 40 gpm
THERMAL CAPACITY: 0.3 million Btu/h
ANNUAL ENERGY: 1.3 billion Btu/y
DESCRIPTION: Thermal spring heats indoor swimming pool.

Date Filed: 05/26/88
Updated:

REFERENCE: Loam, 1980

Site No.: 174
STATE: ID
SITE: Corral
LOCATION: Camas County
APPLICATION TYPE: S, G
RESOURCE TEMP.: 167 F
MAX. FLOW: 31 gpm
THERMAL CAPACITY: 0.6 million Btu/h
ANNUAL ENERGY: 1.2 billion Btu/y
DESCRIPTION: Geothermal well used for space heating two residences and a small greenhouse.

Date Filed: 05/26/88
Updated:

REFERENCE: Lienau, 1986

Site No.: 175
STATE: ID
SITE: Bergdorf Hot Spring
LOCATION: Idaho County
APPLICATION TYPE: S, P
RESOURCE TEMP.: 113 F
MAX. FLOW: 162 gpm
THERMAL CAPACITY: 0.4 million Btu/h
ANNUAL ENERGY: 1.2 billion Btu/y
DESCRIPTION: Thermal spring is used for space heating the Bergdorf resort and a small swimming pool.

Date Filed: 05/26/88
Updated:

REFERENCE: McClain, 1979

Site No.: 176 Date Filed: 05/26/88
STATE: ID Updated:
SITE: LDS Church
LOCATION: Almo
APPLICATION TYPE: S
RESOURCE TEMP.: 93 F
MAX. FLOW: 80 gpm
THERMAL CAPACITY: 0.4 million Btu/h
ANNUAL ENERGY: 0.9 billion Btu/y
DESCRIPTION: Geothermal well provides space heat to a 13,800 sq. ft. church and for sidewalk snow melt.

REFERENCE: Kenkermath, 1985

Site No.: 177 Date Filed: 05/26/88
STATE: ID Updated:
SITE: Del Rio Hot Springs
LOCATION: Preston
APPLICATION TYPE: S, G
RESOURCE TEMP.: 200 F
MAX. FLOW: 20 gpm
THERMAL CAPACITY: 0.4 million Btu/h
ANNUAL ENERGY: 0.9 billion Btu/y
DESCRIPTION: Artesian well heats buildings, a poultry hatchery, a greenhouse, and a slaughterhouse.

REFERENCE: Loam, 1980

Site No.: 178 Date Filed: 05/26/88
STATE: ID Updated:
SITE: Riggins Hot Springs
LOCATION: Idaho County
APPLICATION TYPE: G, S
RESOURCE TEMP.: 113 F
MAX. FLOW: 50 gpm
THERMAL CAPACITY: 0.4 million Btu/h
ANNUAL ENERGY: 0.8 billion Btu/y
DESCRIPTION: Thermal spring used to heat a small resort and commercial greenhouse

REFERENCE: McClain, 1979

Site No.: 179 Date Filed: 05/26/88
STATE: ID Updated:
SITE: Express Farms
LOCATION: Marsing
APPLICATION TYPE: G
RESOURCE TEMP.: 99 F
MAX. FLOW: 47 gpm
THERMAL CAPACITY: 0.4 million Btu/h
ANNUAL ENERGY: 0.8 billion Btu/y
DESCRIPTION: The 3,600 sq ft greenhouse is used to raise tomatoes

REFERENCE: Street, 1985

Site No.: 180 Date Filed: 05/26/88
STATE: ID Updated:
SITE: Weiser Hot Springs
LOCATION: Weiser
APPLICATION TYPE: G, S, P
RESOURCE TEMP.: 158 F
MAX. FLOW: 15 gpm
THERMAL CAPACITY: 0.3 million Btu/h
ANNUAL ENERGY: 0.7 billion Btu/y
DESCRIPTION: Geothermal well provides space heating to a small resort, two greenhouses and a swimming pool.

REFERENCE: McClain, 1979

Site No.: 181 Date Filed: 05/26/88
STATE: ID Updated:
SITE: Givens Hot Springs
LOCATION: Owyhee County
APPLICATION TYPE: P
RESOURCE TEMP.: 120 F
MAX. FLOW: 650 gpm
THERMAL CAPACITY: 0.2 million Btu/h
ANNUAL ENERGY: 0.5 billion Btu/y
DESCRIPTION: A small swimming pool is heated.

REFERENCE: McClain, 1979

Site No.: 182 Date Filed: 05/26/88
STATE: ID Updated:
SITE: Stanley Dist. Htg. (proposed)
LOCATION: Stanley
APPLICATION TYPE: DH
RESOURCE TEMP.: 140 F
MAX. FLOW: 290 gpm
THERMAL CAPACITY: 0.0 million Btu/h
ANNUAL ENERGY: 0.0 billion Btu/y
DESCRIPTION: The district heating system could consist of 35 residences, 16 businesses, 5 motels, and one school.

REFERENCE: Dellinger, 1981

Site No.: 183 Date Filed: 05/26/88
STATE: ID Updated:
SITE: Twin Springs Resort
LOCATION: Boise
APPLICATION TYPE: S, P
RESOURCE TEMP.: 180 F
MAX. FLOW: gpm
THERMAL CAPACITY: million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION: Thermal water heats an enclosed soaking pool, all buildings, and some of the water piped from the springs turns a Pelton Water Wheel to generate electricity used at the resort.

REFERENCE: Loam, 1980

Site No.: 184 Date Filed: 05/26/88
STATE: IL Updated:
SITE: All of State
LOCATION:
APPLICATION TYPE: HP
RESOURCE TEMP.: 54 F
MAX. FLOW: 8400 gpm
THERMAL CAPACITY: 100.8 million Btu/h
ANNUAL ENERGY: 176.6 billion Btu/y
DESCRIPTION: An estimated 3500 heat pump wells are used for space heating and cooling. The reported annual energy for the heat load only, includes 30 percent ground water and 50 percent vertical earth coupled, the remainder are horizontal earth coupled which are not included.

REFERENCE: McCray, 1988; Ellis, 1988

Site No.: 185 Date Filed: 05/26/88
STATE: IN Updated:
SITE: All of State
LOCATION:
APPLICATION TYPE: HP
RESOURCE TEMP.: 54 F
MAX. FLOW: 32000 gpm
THERMAL CAPACITY: 187.2 million Btu/h
ANNUAL ENERGY: 328.0 billion Btu/y
DESCRIPTION: An estimated 4000 ground water and 1200 vertical closed loop earth coupled heat pump wells are used for space heating and cooling. The reported energy is for the heating load only and in addition there are an estimated 2400 horizontal earth coupled heat pumps not included.

REFERENCE: Ellis, 1988

Site No.: 186 Date Filed: 05/26/88
STATE: IN Updated:
SITE: Corporate Square
LOCATION: Terre Haute
APPLICATION TYPE: HP
RESOURCE TEMP.: 55 F
MAX. FLOW: 0 gpm
THERMAL CAPACITY: 4.2 million Btu/h
ANNUAL ENERGY: 7.4 billion Btu/y
DESCRIPTION: A vertical closed loop earth coupled heat pump wells (326 bores at 150 ft each) are used to supply 350 tons (largest single unit in the U.S.) to a large office building for space heating and cooling.

REFERENCE: Ellis, 1988

Site No.: 187 Date Filed: 05/26/88
STATE: KS Updated:
SITE: All of State
LOCATION:
APPLICATION TYPE: HP
RESOURCE TEMP.: 57 F
MAX. FLOW: 1600 gpm
THERMAL CAPACITY: 8.0 million Btu/h
ANNUAL ENERGY: 14.0 billion Btu/y
DESCRIPTION: An estimated 200 heat pump wells are used for residential space heating and cooling. The reported annual energy is for the heating load only.

REFERENCE: Norton, 1988

Site No.: 188 Date Filed: 05/26/88
STATE: KS Updated:
SITE: Elementary Schools (3)
LOCATION: Garden City
APPLICATION TYPE: HP
RESOURCE TEMP.: 59 F
MAX. FLOW: 440 gpm
THERMAL CAPACITY: 4.7 million Btu/h
ANNUAL ENERGY: 3.3 billion Btu/y
DESCRIPTION: A heat pump well is used for space heating and cooling.

REFERENCE: Norton, 1988

Site No.: 189 Date Filed: 05/26/88
STATE: KY Updated:
SITE: All of State
LOCATION:
APPLICATION TYPE: HP
RESOURCE TEMP.: 59 F
MAX. FLOW: 4200 gpm
THERMAL CAPACITY: 88.2 million Btu/h
ANNUAL ENERGY: 154.5 billion Btu/y
DESCRIPTION: An estimated 3500 heat pump wells are used for space heating and cooling. The reported annual energy is only for the heat load, which includes 525 ground water and 1925 vertical closed loop earth coupled heat pumps. The remainder are horizontal closed loop heat pumps.

REFERENCE: Ellis, 1988

Site No.: 190 Date Filed: 05/26/88
STATE: LA Updated:
SITE: All of State
LOCATION:
APPLICATION TYPE: HP
RESOURCE TEMP.: 69 F
MAX. FLOW: 0 gpm
THERMAL CAPACITY: 90.0 million Btu/h
ANNUAL ENERGY: 78.8 billion Btu/y
DESCRIPTION: An estimated 2500 vertical closed loop earth coupled heat pumps are used for space heating and cooling, only the heating load is reported. The Federal Housing Administration has many units.

REFERENCE: Brand, 1988

Site No.: 191 Date Filed: 05/26/88
STATE: MA Updated:
SITE: English High School
LOCATION: Boston
APPLICATION TYPE: HP
RESOURCE TEMP.: 55 F
MAX. FLOW: 80 gpm
THERMAL CAPACITY: 0.4 million Btu/h
ANNUAL ENERGY: 0.9 billion Btu/y
DESCRIPTION: Ground water heat pump used for space heating

REFERENCE: Mcafee, 1988

Site No.: 192 Date Filed: 05/26/88
STATE: MD Updated:
SITE: All of State
LOCATION:
APPLICATION TYPE: HP
RESOURCE TEMP.: 57 F
MAX. FLOW: 6400 gpm
THERMAL CAPACITY: 46.8 million Btu/h
ANNUAL ENERGY: 82.0 billion Btu/y
DESCRIPTION: An estimated 800 ground water and 500 vertical earth coupled heat pump wells are used for space heating and cooling. The reported annual energy is only for heating loads.

REFERENCE: McCray, 1988; Ellis, 1988

Site No.: 193 Date Filed: 05/26/88
STATE: MI Updated:
SITE: All of State
LOCATION:
APPLICATION TYPE: HP
RESOURCE TEMP.: 47 F
MAX. FLOW: 28000 gpm
THERMAL CAPACITY: 135.0 million Btu/h
ANNUAL ENERGY: 354.8 billion Btu/y
DESCRIPTION: An estimated 3500 ground water heat pump wells and 250 vertical closed-loop ground coupled heat pumps are used for space heating and cooling. Reported annual energy is only for the heating load.

REFERENCE: Ellis, 1988

Site No.: 194 Date Filed: 05/26/88
STATE: MN Updated:
SITE: All of State
LOCATION:
APPLICATION TYPE: HP
RESOURCE TEMP.: 45 F
MAX. FLOW: 6800 gpm
THERMAL CAPACITY: 36.0 million Btu/h
ANNUAL ENERGY: 94.6 billion Btu/y
DESCRIPTION: An estimated 1000 heat pump wells are used for space heating and cooling. These represent 85 percent ground water and 15 percent vertical closed-loop ground coupled. The reported annual energy is only for the heating load.

REFERENCE: Ellis, 1988

Site No.: 195 Date Filed: 05/26/88
STATE: MO Updated:
SITE: All of State
LOCATION:
APPLICATION TYPE: HP
RESOURCE TEMP.: 57 F
MAX. FLOW: 8000 gpm
THERMAL CAPACITY: 54.0 million Btu/h
ANNUAL ENERGY: 47.3 billion Btu/y
DESCRIPTION: An estimated 1000 ground water wells and 500 vertical closed loop earth coupled heat pumps are used for space heating and cooling. The reported annual energy is only for the heating load. In addition there are an estimated 500 horizontal closed loop earth coupled heat pumps.

REFERENCE: Ellis, 1988

Site No.: 196 Date Filed: 05/26/88
STATE: MS Updated:
SITE: All of State
LOCATION:
APPLICATION TYPE: HP
RESOURCE TEMP.: 67 F
MAX. FLOW: 800 gpm
THERMAL CAPACITY: 4.0 million Btu/h
ANNUAL ENERGY: 3.5 billion Btu/y
DESCRIPTION: An estimated 100 ground water heat pump wells are used for space heating and cooling.

REFERENCE: Schultz, 1988

Site No.: 197 Date Filed: 05/26/88
STATE: MS Updated:
SITE: Mississippi Power Co.
LOCATION: mainly southern part
APPLICATION TYPE: HP
RESOURCE TEMP.: 69 F
MAX. FLOW: 0 gpm
THERMAL CAPACITY: 1.1 million Btu/h
ANNUAL ENERGY: 0.9 billion Btu/y
DESCRIPTION: An estimated 89 tons for Biloxi, Poplarville, Taylorsville, and Bay St. Louis are installed for space heating and cooling using vertical earth coupled heat pump wells.

REFERENCE: Patton, 1988

Site No.: 198 Date Filed: 05/26/88
STATE: MS Updated:
SITE: Commercial Buildings
LOCATION: Southern coastal area
APPLICATION TYPE: HP
RESOURCE TEMP.: 69 F
MAX. FLOW: 0 gpm
THERMAL CAPACITY: 1.0 million Btu/h
ANNUAL ENERGY: 0.9 billion Btu/y
DESCRIPTION: Vertical closed loop earth coupled heat pump wells (84 tons) are used for space heating and cooling the Biloxi Welcome Center, the Southern Federal Bank, Gulf Port, and the Post Office Building, Bay St. Louis.

REFERENCE: Patton, 1988

Site No.: 199 Date Filed: 08/19/88
STATE: MT Updated:
SITE: Secondary Oil Recovery
LOCATION: eastern area of MT
APPLICATION TYPE: I
RESOURCE TEMP.: 200 F
MAX. FLOW: 9000 gpm
THERMAL CAPACITY: 542.7 million Btu/h
ANNUAL ENERGY: 3803.0 billion Btu/y
DESCRIPTION: Geothermal fluids are injected into oil wells to move oil towards production wells. This heat is extremely useful in increasing the recovery of up to an additional third of the original oil.

REFERENCE: Reed, 1988

Site No.: 200 Date Filed: 05/26/88
STATE: MT Updated:
SITE: High Country Rose Greenhouses
LOCATION: Helena
APPLICATION TYPE: G
RESOURCE TEMP.: 151 F
MAX. FLOW: 207 gpm
THERMAL CAPACITY: 8.4 million Btu/h
ANNUAL ENERGY: 33.1 billion Btu/y
DESCRIPTION: High Country Roses has an 86,000 ft greenhouse to grow about 50,000 rose bushes. The greenhouse is maintained at 72 to 75F with 55 miles of small diameter pipe suppling geothermal heat.

REFERENCE: GHC Bulletin, 1987

Site No.: 201 Date Filed: 05/26/88
STATE: MT Updated:
SITE: White Sulfur Springs
LOCATION: White Sulfur Springs
APPLICATION TYPE: DH
RESOURCE TEMP.: 136 F
MAX. FLOW: 460 gpm
THERMAL CAPACITY: 5.3 million Btu/h
ANNUAL ENERGY: 16.2 billion Btu/y
DESCRIPTION: A small district heating system has been developed to heat commercial buildings, including a bank and hospital. Historically, the Spa Motel uses hot water from the hot springs to heat a swimming pool.

REFERENCE: Sonderigger, 1981

Site No.: 202 Date Filed: 05/26/88
STATE: MT Updated:
SITE: Warm Springs State Hospital
LOCATION: Warm Springs
APPLICATION TYPE: S
RESOURCE TEMP.: 154 F
MAX. FLOW: 90 gpm
THERMAL CAPACITY: 1.9 million Btu/h
ANNUAL ENERGY: 14.6 billion Btu/y
DESCRIPTION: A moderate temperature (154F) resource provides space and DHW to the hospital. A USDOE PON project.

REFERENCE: Lunis, 1986

Site No.: 203 Date Filed: 05/26/88
STATE: MT Updated:
SITE: Fairmont Hot Springs Resort
LOCATION: Anaconda
APPLICATION TYPE: S, P
RESOURCE TEMP.: 160 F
MAX. FLOW: 200 gpm
THERMAL CAPACITY: 3.0 million Btu/h
ANNUAL ENERGY: 14.5 billion Btu/y
DESCRIPTION: Major new all-year resort where a 140-room hotel, restaurant, game room and mini zoo are geothermal space heated. In addition, the geothermal well (640 ft) heats indoor and outdoor swimming pools.

REFERENCE: Green, 1988

Site No.: 204 Date Filed: 05/26/88
STATE: MT Updated:
SITE: Lolo Hot Springs
LOCATION: Missoula County
APPLICATION TYPE: S, P
RESOURCE TEMP.: 111 F
MAX. FLOW: 180 gpm
THERMAL CAPACITY: 1.8 million Btu/h
ANNUAL ENERGY: 12.6 billion Btu/y
DESCRIPTION: Thermal spring provides space heating to resort facilities, outdoor swimming and indoor soaking pools and is open all year.

REFERENCE: Loam, 1980

Site No.: 205 Date Filed: 05/26/88
STATE: MT Updated:
SITE: Bozeman Hot Springs
LOCATION: Bozeman
APPLICATION TYPE: S, P
RESOURCE TEMP.: 131 F
MAX. FLOW: 977 gpm
THERMAL CAPACITY: 2.0 million Btu/h
ANNUAL ENERGY: 5.8 billion Btu/y
DESCRIPTION: Geothermal fluid from three flowing wells is collected in a concrete tank, then pumped for use in a swimming pool, laundry, and for space heating of a skating rink and warehouse.

REFERENCE: Brown, 1979

Site No.: 206 Date Filed: 05/26/88
STATE: MT Updated:
SITE: Broadwater Athletic Club & HS
LOCATION: Helena
APPLICATION TYPE: S, P
RESOURCE TEMP.: 153 F
MAX. FLOW: 100 gpm
THERMAL CAPACITY: 1.4 million Btu/h
ANNUAL ENERGY: 5.6 billion Btu/y
DESCRIPTION: Thermal spring heats indoor swimming pool, outdoor soaking pool and building which includes an indoor running track and racquetball facility.

REFERENCE: Loam, 1980

Site No.: 207 Date Filed: 05/26/88
STATE: MT Updated:
SITE: Chico Hot Springs
LOCATION: Park County
APPLICATION TYPE: P
RESOURCE TEMP.: 113 F
MAX. FLOW: 320 gpm
THERMAL CAPACITY: 0.8 million Btu/h
ANNUAL ENERGY: 4.6 billion Btu/y
DESCRIPTION: Thermal spring heats outdoor swimming pool, soaking pool and private baths.

REFERENCE: Loam, 1980

Site No.: 208 Date Filed: 05/26/88
STATE: MT Updated:
SITE: Boulder Hot Springs
LOCATION: Boulder
APPLICATION TYPE: S, P, G
RESOURCE TEMP.: 169 F
MAX. FLOW: 500 gpm
THERMAL CAPACITY: 1.0 million Btu/h
ANNUAL ENERGY: 4.4 billion Btu/y
DESCRIPTION: Thermal spring is used for space heating a resort hotel facility, indoor hot baths, and an outdoor swimming pool. Effluent from the hotel heating system flows to a geothermally heated greenhouse.

REFERENCE: Sonderigger, 1981

Site No.: 209 Date Filed: 05/26/88
STATE: MT Updated:
SITE: Jackson Hot Springs Lodge
LOCATION: Jackson
APPLICATION TYPE: S, P
RESOURCE TEMP.: 136 F
MAX. FLOW: 259 gpm
THERMAL CAPACITY: 0.5 million Btu/h
ANNUAL ENERGY: 2.9 billion Btu/y
DESCRIPTION: Thermal spring space heats a lodge, an indoor swimming pool and spas.

REFERENCE: Loam, 1980

Site No.: 210 Date Filed: 05/26/88
STATE: MT Updated:
SITE: Medicine Hot Springs
LOCATION: Conner
APPLICATION TYPE: P
RESOURCE TEMP.: 113 F
MAX. FLOW: 100 gpm
THERMAL CAPACITY: 0.6 million Btu/h
ANNUAL ENERGY: 2.6 billion Btu/y
DESCRIPTION: Thermal spring heats swimming pool and three spas.

REFERENCE: Loam, 1980

Site No.: 211 Date Filed: 05/26/88
STATE: MT Updated:
SITE: Sleeping Child Hot Springs
LOCATION: Ravalli County
APPLICATION TYPE: P
RESOURCE TEMP.: 113 F
MAX. FLOW: 530 gpm
THERMAL CAPACITY: 0.7 million Btu/h
ANNUAL ENERGY: 2.5 billion Btu/y
DESCRIPTION: Thermal spring heats an outdoor swimming pool, soaking pool and an indoor sauna.

REFERENCE: Loam, 1980

Site No.: 212 Date Filed: 05/26/88
STATE: MT Updated:
SITE: Barkell's Hot Springs
LOCATION: Silver Star
APPLICATION TYPE: P
RESOURCE TEMP.: 161 F
MAX. FLOW: 150 gpm
THERMAL CAPACITY: 0.7 million Btu/h
ANNUAL ENERGY: 2.2 billion Btu/y
DESCRIPTION: Barkell's Hot Springs is a resort facility and the thermal fluid is piped underground to the swimming pool in Silver Star.

REFERENCE: Loam, 1980

Site No.: 213 Date Filed: 05/26/88
STATE: MT Updated:
SITE: New Biltmore Hot Springs
LOCATION: Madison County
APPLICATION TYPE: P
RESOURCE TEMP.: 127 F
MAX. FLOW: 26 gpm
THERMAL CAPACITY: 0.3 million Btu/h
ANNUAL ENERGY: 1.8 billion Btu/y
DESCRIPTION: The thermal springs is used in a recreational spa and for a swimming pool.

REFERENCE: Loam, 1980

Site No.: 214 Date Filed: 05/26/88
STATE: MT Updated:
SITE: Ennis Hot Springs
LOCATION: Ennis
APPLICATION TYPE: I
RESOURCE TEMP.: 181 F
MAX. FLOW: 100 gpm
THERMAL CAPACITY: 0.8 million Btu/h
ANNUAL ENERGY: 1.7 billion Btu/y
DESCRIPTION: A shallow (100 ft) geothermal well provides hot water for a laundry facility.

REFERENCE: Sonderegger, 1981

Site No.: 215 Date Filed: 05/26/88
STATE: MT Updated:
SITE: Camas Hot Springs
LOCATION: Hot Springs
APPLICATION TYPE: P
RESOURCE TEMP.: 104 F
MAX. FLOW: 24 gpm
THERMAL CAPACITY: 0.2 million Btu/h
ANNUAL ENERGY: 0.7 billion Btu/y
DESCRIPTION: Large health center owned and operated by the Flathead Indian Tribes uses thermal spring for swimming pool and bath houses.

REFERENCE: Loam, 1980

Site No.: 216 Date Filed: 05/26/88
STATE: MT Updated:
SITE: Hillbrook Nursing Home
LOCATION: Clancy
APPLICATION TYPE: S, P
RESOURCE TEMP.: 133 F
MAX. FLOW: 100 gpm
THERMAL CAPACITY: 0.2 million Btu/h
ANNUAL ENERGY: 0.6 billion Btu/y
DESCRIPTION: Thermal spring provides space heating for nursing home and an indoor therapeutic pool.

REFERENCE: Sonderegger, 1981

Site No.: 217 Date Filed: 05/26/88
STATE: MT Updated:
SITE: Brooks Warm Springs
LOCATION: Fergus County
APPLICATION TYPE: A
RESOURCE TEMP.: 70 F
MAX. FLOW: 72000 gpm
THERMAL CAPACITY: 0.0 million Btu/h
ANNUAL ENERGY: 0.0 billion Btu/y
DESCRIPTION: A large aquaculture facility will be developed to raise sturgeon. The total flow from this thermal spring is about 72,000 gpm and the developers are in the process of obtaining permits (May 1988). A temperature drop of 2 F would provide nearly a trillion Btu/y to an aquaculture facility.

REFERENCE: Culver, 1988

Site No.: 218 Date Filed: 05/26/88
STATE: NB Updated:
SITE: Northern Part of State
LOCATION: mainly Boyd & Keya Paho Co's
APPLICATION TYPE: HP
RESOURCE TEMP.: 52 F
MAX. FLOW: 2400 gpm
THERMAL CAPACITY: 23.4 million Btu/h
ANNUAL ENERGY: 41.0 billion Btu/y
DESCRIPTION: An estimated 1000 heat pump wells are used for space heating and cooling. The reported annual energy is for heat load only, includes 30 percent ground water and 35 percent vertical earth coupled heat pump wells. The remainder are horizontal earth coupled and are not included.

REFERENCE: Eversoll, 1988 & Ellis, 1988

Site No.: 219 Date Filed: 05/26/88
STATE: NB Updated:
SITE: Homestead National Monument
LOCATION: Beatice
APPLICATION TYPE: HP
RESOURCE TEMP.: 58 F
MAX. FLOW: 32 gpm
THERMAL CAPACITY: 0.2 million Btu/h
ANNUAL ENERGY: 0.3 billion Btu/y
DESCRIPTION: A heat pump well is used for space heating and cooling of the administrative building.

REFERENCE: McMurray, 1988

Site No.: 220 Date Filed: 05/26/88
STATE: NC Updated:
SITE: All of State
LOCATION:
APPLICATION TYPE: HP
RESOURCE TEMP.: 63 F
MAX. FLOW: 16800 gpm
THERMAL CAPACITY: 91.8 million Btu/h
ANNUAL ENERGY: 80.4 billion Btu/y
DESCRIPTION: An estimated 3000 heat pump wells are used for space heating and cooling (including five large commercial installations), 77 installations with injection wells. The reported annual energy includes 70 percent ground water and 15 percent vertical earth coupled heat pump wells. The remainder are horizontal earth coupled and are not included.

REFERENCE: Bennette, 1988; Ellis, 1988

Site No.: 221 Date Filed: 08/19/88
STATE: ND Updated:
SITE: Secondary Oil Recover
LOCATION: southeastern area of ND
APPLICATION TYPE: I
RESOURCE TEMP.: 170 F
MAX. FLOW: 1500 gpm
THERMAL CAPACITY: 75.1 million Btu/h
ANNUAL ENERGY: 526.2 billion Btu/y
DESCRIPTION: Geothermal fluids are injected into oil wells to move oil towards production wells. This heat is extremely useful in increasing the recovery of up to an additional third of the original oil.

REFERENCE: Reed, 1988

Site No.: 222 Date Filed: 05/26/88
STATE: ND Updated:
SITE: All of State
LOCATION: mainly the Fargo area
APPLICATION TYPE: HP
RESOURCE TEMP.: 42 F
MAX. FLOW: 2400 gpm
THERMAL CAPACITY: 18.0 million Btu/h
ANNUAL ENERGY: 47.3 billion Btu/y
DESCRIPTION: An estimated 500 heat pump wells are used for space heating and cooling. The reported annual energy is for heating load only, includes 300 ground water and 200 vertical earth coupled heat pump wells.

REFERENCE: NWWA, 1988; Ellis, 1988

Site No.: 223 Date Filed: 05/26/88
STATE: ND Updated:
SITE: Buxton School
LOCATION: Fargo
APPLICATION TYPE: HP
RESOURCE TEMP.: 42 F
MAX. FLOW: 0 gpm
THERMAL CAPACITY: 1.2 million Btu/h
ANNUAL ENERGY: 3.2 billion Btu/y
DESCRIPTION: A 100 ton vertical closed loop earth coupled (100 bore holes) heat pump is used for space heating and cooling. The reported annual energy is only for the heating load.

REFERENCE: Ellis, 1988

Site No.: 224 Date Filed: 05/26/88
STATE: NJ Updated:
SITE: All of State
LOCATION:
APPLICATION TYPE: HP
RESOURCE TEMP.: 55 F
MAX. FLOW: 2400 gpm
THERMAL CAPACITY: 23.4 million Btu/h
ANNUAL ENERGY: 41.0 billion Btu/y
DESCRIPTION: An estimated 300 ground water and 350 verticla earth coupled heat pump wells are used for space heating and cooling.

REFERENCE: Ellis, 1988

Site No.: 225 Date Filed: 05/26/88
STATE: NM Updated:
SITE: Burgett Floral Greenhouses
LOCATION: Near Animas
APPLICATION TYPE: G
RESOURCE TEMP.: 245 F
MAX. FLOW: 250 gpm
THERMAL CAPACITY: 18.6 million Btu/h
ANNUAL ENERGY: 65.3 billion Btu/y
DESCRIPTION: Ten acres of greenhouses growing cut roses. Forced air heating system - 40% utilization factor.

REFERENCE: Lund, 1987

Site No.: 226 Date Filed: 05/26/88
STATE: NM Updated:
SITE: New Mexico State University
LOCATION: Las Cruces
APPLICATION TYPE: S, DHW
RESOURCE TEMP.: 142 F
MAX. FLOW: 417 gpm
THERMAL CAPACITY: 3.7 million Btu/h
ANNUAL ENERGY: 45.9 billion Btu/y
DESCRIPTION: Domestic hot water up to 400 gpm swimming pool heating, space heating and a small greenhouse are heated by wells 850-950 ft deep.

REFERENCE: Cunniff NMSU Demo Proj DOE/IP

Site No.: 227 Date Filed: 05/26/88
STATE: NM Updated:
SITE: Ojo Caliente Resort
LOCATION: 50 mi N of Santa Fe
APPLICATION TYPE: P
RESOURCE TEMP.: 115 F
MAX. FLOW: 60 gpm
THERMAL CAPACITY: 0.5 million Btu/h
ANNUAL ENERGY: 2.0 billion Btu/y
DESCRIPTION: An older resort and bath house, outdoor pool, soaking tubs and full spa services (mud baths, sweat wrap, etc).

REFERENCE: Loam, 1985

Site No.: 228 Date Filed: 05/26/88
STATE: NM Updated:
SITE: Jemez Springs
LOCATION:
APPLICATION TYPE: S
RESOURCE TEMP.: 165 F
MAX. FLOW: 0 gpm
THERMAL CAPACITY: 0.6 million Btu/h
ANNUAL ENERGY: 1.3 billion Btu/y
DESCRIPTION: A bath house and motel utilize natural springs and a well supplies heat for small municipal building.

REFERENCE: Lienau, 1986; Loam, 1985

Site No.: 229 Date Filed: 05/26/88
STATE: NM Updated:
SITE: Truth or Consequences
LOCATION:
APPLICATION TYPE: P
RESOURCE TEMP.: 113 F
MAX. FLOW: gpm
THERMAL CAPACITY: million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION: At least 8 natural mineral water bath houss are located in the hot springs area. Most are older and small, having only 3-9 spa/soaking tubs therapy and massage.

REFERENCE: Loam, 1985

Site No.: 230 Date Filed: 07/20/88
STATE: NM Updated:
SITE: Masson Greenhouses
LOCATION: Radium Springs
APPLICATION TYPE: G
RESOURCE TEMP.: F
MAX. FLOW: gpm
THERMAL CAPACITY: million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION: The greenhouses raise cut flowers in 4 acres using 2 production wells and 2 injection wells to supply a heat exchanger. The company employs 40 persons. The state of New Mexico assisted in drilling the wells and taxes will payoff the states' investment in 2 years.

REFERENCE:

Site No.: 231 Date Filed: 05/26/88
STATE: NV Updated:
SITE: Round Mountain Gold Corp
LOCATION: Smoky Valley, NV
APPLICATION TYPE: I
RESOURCE TEMP.: 186 F
MAX. FLOW: 650 gpm
THERMAL CAPACITY: 30.0 million Btu/h
ANNUAL ENERGY: 262.8 billion Btu/y
DESCRIPTION: Use 186 F geothermal fluide to heat cyanide circuit (2000 pgm) from 42 F to 72 F. Injection of spent geothermal fluids.

REFERENCE: Trexler, 1988

Site No.: 232 Date Filed: 05/26/88
STATE: NV Updated: 07/20/88
SITE: Hunt's Ash Springs
LOCATION: Lincoln Co. S. of Hieiko
APPLICATION TYPE: P
RESOURCE TEMP.: 97 F
MAX. FLOW: 9000 gpm
THERMAL CAPACITY: 22.5 million Btu/h
ANNUAL ENERGY: 157.7 billion Btu/y
DESCRIPTION: This large natural spring supplies large natural swimming pools. Other facilities include restaurant, store, service station, RV hook ups, camping, etc.

REFERENCE: Loam.1985; Trexler, 1988

Site No.: 233 Date Filed: 05/26/88
STATE: NV Updated:
SITE: Geothermal Food Processors
LOCATION: Brady Hot Springs E. of Fernly
APPLICATION TYPE: I
RESOURCE TEMP.: 270 F
MAX. FLOW: 1000 gpm
THERMAL CAPACITY: 19.0 million Btu/h
ANNUAL ENERGY: 86.0 billion Btu/y
DESCRIPTION: A food dehydration facility drying onions, garlic, celery, carrots. In operation since 1978.

REFERENCE: Lienau. 1986

Site No.: 234 Date Filed: 07/20/88
STATE: NV Updated:
SITE: Warren Properties
LOCATION: Reno
APPLICATION TYPE: DH,DHW
RESOURCE TEMP.: 212 F
MAX. FLOW: 710 gpm
THERMAL CAPACITY: 33.0 million Btu/h
ANNUAL ENERGY: 72.3 billion Btu/y
DESCRIPTION: Warren Properties is a residential district heating system serving a potential 170 homes. Currently 69 homes are on the system and lots have been sold for the remaining 100. The project consists of two phases; Warren Estates (complete) and Manzanita Estates.

REFERENCE: MacKay

Site No.: 235 Date Filed: 05/26/88
STATE: NV Updated:
SITE: Peppermill Inn & Casino
LOCATION: 127
APPLICATION TYPE: S, P
RESOURCE TEMP.: 127 F
MAX. FLOW: 1200 gpm
THERMAL CAPACITY: 24.0 million Btu/h
ANNUAL ENERGY: 63.0 billion Btu/y
DESCRIPTION: Space heat and hot water for casino, kitchen and 579 hotel rooms, and pools. Three wells approximately 750 ft. deep.

REFERENCE: Petty, 1988; NOCS, 1987

Site No.: 236 Date Filed: 05/26/88
STATE: NV Updated:
SITE: Warm Spring Resort
LOCATION: 50 mi. N. of Las Vegas
APPLICATION TYPE: P
RESOURCE TEMP.: 90 F
MAX. FLOW: 3240 gpm
THERMAL CAPACITY: 8.0 million Btu/h
ANNUAL ENERGY: 63.0 billion Btu/y
DESCRIPTION: Owned by a nationwide campers organization - RV hook-ups and camping only for members. Grounds and pools open to public for day use. Several natural swim pools, a large man-made swim pool and hydro pool.

REFERENCE: Loam, 1980; Trexler, 1988

Site No.: 237 Date Filed: 05/26/88
STATE: NV Updated:
SITE: Pegusus Gold Corp Florida Cany
LOCATION: Humbolt House (Rye Patch KGRA)
APPLICATION TYPE: I
RESOURCE TEMP.: 238 F
MAX. FLOW: 400 gpm
THERMAL CAPACITY: 4.6 million Btu/h
ANNUAL ENERGY: 40.0 billion Btu/y
DESCRIPTION: Tube-in-shell heat exchanger is used to heat cyanide solution from 42 to 56 F (yearly average) in heap leaching operation. Geothermal fluids are also used as make up water.

REFERENCE: Trexler, 1988; Beck 1988

Site No.: 238 Date Filed: 05/26/88
STATE: NV Updated:
SITE: Elko Disrict Heat
LOCATION: Elko
APPLICATION TYPE: DH
RESOURCE TEMP.: 178 F
MAX. FLOW: 805 gpm
THERMAL CAPACITY: 16.8 million Btu/h
ANNUAL ENERGY: 36.7 billion Btu/y
DESCRIPTION: The system serves eight businesses and buildings and also the sewage digester plant.

REFERENCE: Lienau, 1986

Site No.: 239 Date Filed: 05/26/88
STATE: NV Updated:
SITE: Reno-Moana Area (200)
LOCATION: Reno
APPLICATION TYPE: S
RESOURCE TEMP.: 120 F
MAX. FLOW: 0 gpm
THERMAL CAPACITY: 14.0 million Btu/h
ANNUAL ENERGY: 31.8 billion Btu/y
DESCRIPTION: Approximately 200 homes in the Moana area are heated using down-hole heat exchangers. Some of the wells pump small amounts to maintain temperature in the wells. The use is expanding rather fast - at times one home every two weeks.

REFERENCE: McKay Drillers; McKay Geotherm

Site No.: 240 Date Filed: 05/26/88
STATE: NV Updated:
SITE: Walley Hot Spring Resort
LOCATION: E. of Minden
APPLICATION TYPE: S, P
RESOURCE TEMP.: 160 F
MAX. FLOW: 130 gpm
THERMAL CAPACITY: 4.6 million Btu/h
ANNUAL ENERGY: 27.9 billion Btu/y
DESCRIPTION: Natural springs at 110 F and wells at 160 F are utilized for large swimming pools, soaking pools, spas and domestic hot water and space heating most, if not all, the large complex.

REFERENCE: Loam, 1980; Gordon, 1988

Site No.: 241 Date Filed: 07/20/88
STATE: NV Updated:
SITE: Elko County School District
LOCATION: Elko
APPLICATION TYPE: DH,S,HP
RESOURCE TEMP.: 190 F
MAX. FLOW: 300 gpm
THERMAL CAPACITY: 7.2 million Btu/h
ANNUAL ENERGY: 15.7 billion Btu/y
DESCRIPTION: The ECSD district heating system started operating in 1986. A loop from a central plate heat exchanger delivers 180 F water to the school administration offices, gym., convention center, hospital, municipal pool, city hall and Jr. High School (heat pump system). An impressive 100 F temperature drop is achieved across the system and disposal is to percolation ponds and golf course irrigation.

REFERENCE: Rafferty, 1988

Site No.: 242 Date Filed: 05/26/88
STATE: NV Updated:
SITE: Hobo Hot Springs
LOCATION: 9 mi. So. of Carson City
APPLICATION TYPE: A
RESOURCE TEMP.: 106 F
MAX. FLOW: 100 gpm
THERMAL CAPACITY: 2.0 million Btu/h
ANNUAL ENERGY: 14.4 billion Btu/y
DESCRIPTION: Tropical fish production. See article in GRC Trans. V.11, pg 3.

REFERENCE: Trexler, 1988

Site No.: 243 Date Filed: 05/26/88
STATE: NV Updated:
SITE: Warren Estates
LOCATION: Reno
APPLICATION TYPE: DH
RESOURCE TEMP.: 209 F
MAX. FLOW: 1000 gpm
THERMAL CAPACITY: 3.6 million Btu/h
ANNUAL ENERGY: 7.9 billion Btu/y
DESCRIPTION: This district heating system supplis space heating and DHW for residences in the development. Forty homes are currently on line. Ninety more lots are available. The system is always expanding as new homes are built.

REFERENCE: NOCS, 1987

Site No.: 244 Date Filed: 05/26/88
STATE: NV Updated:
SITE: Moana Municipal Pool
LOCATION: Reno
APPLICATION TYPE: P
RESOURCE TEMP.: 127 F
MAX. FLOW: 109 gpm
THERMAL CAPACITY: 2.6 million Btu/h
ANNUAL ENERGY: 7.7 billion Btu/y
DESCRIPTION: A large indoor pool operated by the City Parks and Recreation Department. Retrofilled to geothermal in 1981.

REFERENCE: Rafferty, 1982

Site No.: 245 Date Filed: 05/26/88
STATE: NV Updated:
SITE: Caliente City Pool
LOCATION: Caliente
APPLICATION TYPE: P
RESOURCE TEMP.: 175 F
MAX. FLOW: 150 gpm
THERMAL CAPACITY: 3.4 million Btu/h
ANNUAL ENERGY: 7.4 billion Btu/y
DESCRIPTION: A large municipal pool. Uses one well and heat exchanger.

REFERENCE: Lienau, 1986

Site No.: 246 Date Filed: 05/26/88
STATE: NV Updated:
SITE: Carson Hot Springs
LOCATION: Carson City
APPLICATION TYPE: P
RESOURCE TEMP.: 120 F
MAX. FLOW: 75 gpm
THERMAL CAPACITY: 0.8 million Btu/h
ANNUAL ENERGY: 5.7 billion Btu/y
DESCRIPTION: This old resort has an outdoor pool and nine large soaking pools.

REFERENCE: Loam, 1980; Trexler, 1988

Site No.: 247 Date Filed: 05/26/88
STATE: NV Updated:
SITE: Bowers Mansion
LOCATION: Carson City
APPLICATION TYPE: P
RESOURCE TEMP.: 116 F
MAX. FLOW: 75 gpm
THERMAL CAPACITY: 1.4 million Btu/h
ANNUAL ENERGY: 4.7 billion Btu/y
DESCRIPTION: A Washoe County park with large geothermal pool. Open only part of the year.

REFERENCE: Loam, 1980; Trexler, 1988

Site No.: 248 Date Filed: 05/26/88
STATE: NV Updated:
SITE: Brockway Springs Resort
LOCATION: N. Shore of Lake Tahoe
APPLICATION TYPE: P
RESOURCE TEMP.: 180 F
MAX. FLOW: 150 gpm
THERMAL CAPACITY: 0.5 million Btu/h
ANNUAL ENERGY: 3.9 billion Btu/y
DESCRIPTION: Once a large resort hotel, it has been restored with additions, and now is a condominium. Six springs feed a large coffer dam pool in Lake Tahoe.

REFERENCE: Kaysing, 1984

Site No.: 249 Date Filed: 05/26/88
STATE: NV Updated:
SITE: Caliente Hot Springs Motel
LOCATION: Caliente
APPLICATION TYPE: P
RESOURCE TEMP.: 115 F
MAX. FLOW: 40 gpm
THERMAL CAPACITY: 0.4 million Btu/h
ANNUAL ENERGY: 2.4 billion Btu/y
DESCRIPTION: The motel utilizes a warm well to heat a swimming pool and soaking pools.

REFERENCE: Loam, 1980; Trexler, 1988

Site No.: 250 Date Filed: 05/26/88
STATE: NV Updated:
SITE: Carlin High School
LOCATION: Carlin
APPLICATION TYPE: HP
RESOURCE TEMP.: 87 F
MAX. FLOW: 60 gpm
THERMAL CAPACITY: 0.9 million Btu/h
ANNUAL ENERGY: 2.0 billion Btu/y
DESCRIPTION: A heat pump system.

REFERENCE: Lienau, 1986

Site No.: 251 Date Filed: 05/26/88
STATE: NV Updated:
SITE: Wells High School
LOCATION: Wells
APPLICATION TYPE: HP
RESOURCE TEMP.: 87 F
MAX. FLOW: 50 gpm
THERMAL CAPACITY: 0.8 million Btu/h
ANNUAL ENERGY: 1.6 billion Btu/y
DESCRIPTION: A ground water heat pump system is used for space heating and cooling.

REFERENCE: Lienau, 1986

Site No.: 252 Date Filed: 05/26/88
STATE: NV Updated:
SITE: Medical Center
LOCATION: Caliente
APPLICATION TYPE: S
RESOURCE TEMP.: 167 F
MAX. FLOW: 46 gpm
THERMAL CAPACITY: 0.7 million Btu/h
ANNUAL ENERGY: 1.5 billion Btu/y
DESCRIPTION: This medical center/small hospital was electrically heated and retrofilled to utilize geothermal.

REFERENCE: Lienau, 1986

Site No.: 253 Date Filed: 05/26/88
STATE: NV Updated:
SITE: Wabuska
LOCATION: N. of Yerrington
APPLICATION TYPE: A
RESOURCE TEMP.: 270 F
MAX. FLOW: 1300 gpm
THERMAL CAPACITY: 0.0 million Btu/h
ANNUAL ENERGY: 0.0 billion Btu/y
DESCRIPTION: A small aquaculture facility utilizes some effluent from a binary power plant. Various species, mostly tropicals, are grown.

REFERENCE: Culver, 1988

Site No.: 254 Date Filed: 07/20/88
STATE: NV Updated:
SITE: Lakeview Apartments
LOCATION: Reno
APPLICATION TYPE: DHW
RESOURCE TEMP.: 130 F
MAX. FLOW: gpm
THERMAL CAPACITY: million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION: A number of apartment buildings will be retrofitted to geothermal domestic hot water (DHW).

REFERENCE: MacKay, 1988

Site No.: 255 Date Filed: 05/26/88
STATE: NV Updated:
SITE: Baileys Hot Springs
LOCATION: E. of Death Valley Nat'l Monu.
APPLICATION TYPE: P
RESOURCE TEMP.: 160 F
MAX. FLOW: gpm
THERMAL CAPACITY: million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION: Primarily a restaurant, bar,casino and RV park. Has three large pools, formerly railraod water storage reservoirs; now used as pools.

REFERENCE: Loam 1980; Trexler, 1988

Site No.: 256 Date Filed: 05/26/88
STATE: NV Updated:
SITE: Wells Rural Electric
LOCATION: Wells
APPLICATION TYPE: HP
RESOURCE TEMP.: F
MAX. FLOW: gpm
THERMAL CAPACITY: million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION:

REFERENCE: Petty, 1988

Site No.: 257 Date Filed: 05/26/88
STATE: NV Updated:
SITE: Aqua Caliente Trailer Park
LOCATION: Caliente
APPLICATION TYPE: S
RESOURCE TEMP.: 152 F
MAX. FLOW: 200 gpm
THERMAL CAPACITY: million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION: The trailer and RV hookups include hot water that can be used for heating and DHW as well as the usual water power and sewer. The utilization depends on the number of units, but is fairly low.

REFERENCE: Culver, 1988

Site No.: 258 Date Filed: 05/26/88
STATE: NV Updated:
SITE: Gerlach Hot Springs
LOCATION: Gerlach
APPLICATION TYPE: P
RESOURCE TEMP.: 200 F
MAX. FLOW: gpm
THERMAL CAPACITY: million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION: Local citizens formed an improvement district and raised funds to construct a new facility to replace a dangerous old natural pool feed by scalding water. The new facility is not yet completed and an opening date has not been set.

REFERENCE: Loam 1980; Minto, 1988

Site No.: 259 Date Filed: 05/26/88
STATE: NV Updated:
SITE: Elko Jr. High School
LOCATION: Elko
APPLICATION TYPE: S
RESOURCE TEMP.: 190 F
MAX. FLOW: 300 gpm
THERMAL CAPACITY: million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION:

REFERENCE: Petty, 1988

Site No.: 260 Date Filed: 07/20/88
STATE: NV Updated:
SITE: Salem Plaza
LOCATION: Reno
APPLICATION TYPE: S,DHW
RESOURCE TEMP.: 160 F
MAX. FLOW: gpm
THERMAL CAPACITY: million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION: Salem Plaza will be retrofitted to geothermal space heating using a production well (1,500 ft) and an injection well (1,500 ft). A USDOE PON project.

REFERENCE: Gordon, 1988

Site No.: 261 Date Filed: 05/26/88
STATE: NV Updated:
SITE: Steamboat Springs (Spa)
LOCATION: S. of Reno
APPLICATION TYPE: S, P
RESOURCE TEMP.: 200 F
MAX. FLOW: 590 gpm
THERMAL CAPACITY: million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION: Only a very small portion of the flow is used for spas (supervised by registered nurse) and space heating.

REFERENCE: Loam, 1980; Culver, 1988

Site No.: 262 Date Filed: 05/26/88
STATE: NY Updated:
SITE: All of State
LOCATION: mainly north central
APPLICATION TYPE: HP
RESOURCE TEMP.: 47 F
MAX. FLOW: 2000 gpm
THERMAL CAPACITY: 11.2 million Btu/h
ANNUAL ENERGY: 29.3 billion Btu/y
DESCRIPTION: An estimated 250 ground water and 60 vertical closed loop earth coupled heat pump wells are used for space heating and cooling. The reported annual energy is for the heating load only. In addition there are approximately 240 horizontal earth coupled heat pumps that are not included.

REFERENCE: Krachow, 1988 & Ellis, 1988

Site No.: 263 Date Filed: 05/26/88
STATE: NY Updated:
SITE: Sagamore Resort
LOCATION: Lake George (N. of Albany)
APPLICATION TYPE: HP
RESOURCE TEMP.: 46 F
MAX. FLOW: 0 gpm
THERMAL CAPACITY: 4.2 million Btu/h
ANNUAL ENERGY: 11.0 billion Btu/y
DESCRIPTION: A vertical closed loop earth coupled heat pump (350 tons) is used for space heating and cooling a large resort and 200 cabins.

REFERENCE: Ellis, 1988

Site No.: 264 Date Filed: 05/26/88
STATE: NY Updated:
SITE: E. Middle School & Cayuga C.C.
LOCATION: Auburn
APPLICATION TYPE: S, HP
RESOURCE TEMP.: 125 F
MAX. FLOW: 60 gpm
THERMAL CAPACITY: 2.0 million Btu/h
ANNUAL ENERGY: 4.5 billion Btu/y
DESCRIPTION: A geothermal well is used for direct and heat pump space heating.

REFERENCE: Krachow, 1988

Site No.: 265 Date Filed: 05/26/88
STATE: OH Updated:
SITE: All of State
LOCATION:
APPLICATION TYPE: HP
RESOURCE TEMP.: 53 F
MAX. FLOW: 25600 gpm
THERMAL CAPACITY: 129.6 million Btu/h
ANNUAL ENERGY: 227.0 billion Btu/y
DESCRIPTION: An estimated 3200 ground water and 400 vertical closed loop earth coupled heat pump wells are used for space heating and cooling. The reported annual energy is for the heating load only.

REFERENCE: Ellis, 1988

Site No.: 266 Date Filed: 05/26/88
STATE: OK Updated:
SITE: Central Part of State
LOCATION:
APPLICATION TYPE: HP
RESOURCE TEMP.: 62 F
MAX. FLOW: 240 gpm
THERMAL CAPACITY: 1.2 million Btu/h
ANNUAL ENERGY: 1.0 billion Btu/y
DESCRIPTION: An estimated 30 heat pump wells are used for residential space heating and cooling.

REFERENCE: Luze, 1988

Site No.: 267 Date Filed: 05/26/88
STATE: OR Updated:
SITE: Oregon Trail Mushrooms
LOCATION: Vale
APPLICATION TYPE: I
RESOURCE TEMP.: 235 F
MAX. FLOW: 275 gpm
THERMAL CAPACITY: 20.6 million Btu/h
ANNUAL ENERGY: 54.1 billion Btu/y
DESCRIPTION: The $8.5 million mushroom growing facility produces 5 million pounds annually in 40 growing rooms maintained at 64 - 140F. In addition, a lithium bromide chiller is used for space cooling and compost is heated with geothermal fluids.

REFERENCE: Rutten, 1987

Site No.: 268 Date Filed: 05/26/88
STATE: OR Updated:
SITE: Klamath Residence (505)
LOCATION: Klamath Falls
APPLICATION TYPE: S
RESOURCE TEMP.: 200 F
MAX. FLOW: 0 gpm
THERMAL CAPACITY: 20.2 million Btu/h
ANNUAL ENERGY: 44.2 billion Btu/y
DESCRIPTION: An estimated 505 homes in the Klamath Falls area are geothermally heated by the use of downhole heat exchangers.

REFERENCE: Lienua, 1986

Site No.: 269 Date Filed: 05/26/88
STATE: OR Updated:
SITE: Oregon Institute of Tech.
LOCATION: Klamath Falls
APPLICATION TYPE: DH
RESOURCE TEMP.: 192 F
MAX. FLOW: 620 gpm
THERMAL CAPACITY: 16.8 million Btu/h
ANNUAL ENERGY: 38.2 billion Btu/y
DESCRIPTION: Three production wells provide space heating/cooling and DHW to eleven campus building (670,000 sq ft) and an olympic-size swimming pool. An innovative development has been to use 125F effluent from other buildings to heat the new Purvine Hall which conserves the resource.

REFERENCE: Lienau, 1986

Site No.: 270 Date Filed: 05/26/88
STATE: OR Updated:
SITE: Kah-nee-ta
LOCATION: Warm Springs
APPLICATION TYPE: P, DHW
RESOURCE TEMP.: 126 F
MAX. FLOW: 450 gpm
THERMAL CAPACITY: 4.5 million Btu/h
ANNUAL ENERGY: 27.6 billion Btu/y
DESCRIPTION: Thermal spring is used to heat the swimming pool, mineral baths, DHW, and tribal bathhouse.

REFERENCE: Dellinger, 1982

Site No.: 271 Date Filed: 05/26/88
STATE: OR Updated:
SITE: Merle West Medical Center
LOCATION: Klamath Falls
APPLICATION TYPE: S
RESOURCE TEMP.: 191 F
MAX. FLOW: 325 gpm
THERMAL CAPACITY: 10.5 million Btu/h
ANNUAL ENERGY: 23.9 billion Btu/y
DESCRIPTION: One production well provides space and DHW to the medical center and the Klamath County Nursing Home.

REFERENCE: Lienau, 1986

Site No.: 272 Date Filed: 05/26/88
STATE: OR Updated:
SITE: Klamath County Jail
LOCATION: Klamath Falls
APPLICATION TYPE: S
RESOURCE TEMP.: 150 F
MAX. FLOW: 700 gpm
THERMAL CAPACITY: 10.5 million Btu/h
ANNUAL ENERGY: 23.0 billion Btu/y
DESCRIPTION: Klamath County buildings, including public health, juvenile dept. and the new county jail are heated with geothermal fluid that uses an injection well for disposal.

REFERENCE: Lienau, 1986

Site No.: 273 Date Filed: 05/26/88
STATE: OR Updated:
SITE: Klamath Schools (7)
LOCATION: Klamath Falls
APPLICATION TYPE: S
RESOURCE TEMP.: 180 F
MAX. FLOW: 0 gpm
THERMAL CAPACITY: 8.7 million Btu/h
ANNUAL ENERGY: 19.8 billion Btu/y
DESCRIPTION: Seven public schools use geothermal for space and DHW heating.

REFERENCE: Lienau, 1986

Site No.: 274 Date Filed: 05/26/88
STATE: OR Updated:
SITE: Klamath Apartment Bldgs. (13)
LOCATION: Klamath Falls
APPLICATION TYPE: S
RESOURCE TEMP.: 180 F
MAX. FLOW: 0 gpm
THERMAL CAPACITY: 6.5 million Btu/h
ANNUAL ENERGY: 14.2 billion Btu/y
DESCRIPTION: Thirteen apartment buildings use geothermal for space and DHW heating.

REFERENCE: Lienau, 1986

Site No.: 275 Date Filed: 05/26/88
STATE: OR Updated:
SITE: The Greenhouse
LOCATION: Lakeview
APPLICATION TYPE: G
RESOURCE TEMP.: 220 F
MAX. FLOW: 700 gpm
THERMAL CAPACITY: 4.7 million Btu/h
ANNUAL ENERGY: 8.8 billion Btu/y
DESCRIPTION: The greenhouse heating system consists of a main greenhouse occupying 26,000 sq ft of floor area and two small greenhouses attached to the main house. Fan radiators, finned tube radiators, soil warming pipes and a snow meltes heating systems are used. It is proposed that five additional greenhouses be constructed on the site.

REFERENCE: Rafferty, 1981

Site No.: 276 Date Filed: 05/26/88
STATE: OR Updated:
SITE: Maywood Industries of Oregon
LOCATION: Klamath County
APPLICATION TYPE: S
RESOURCE TEMP.: 118 F
MAX. FLOW: 450 gpm
THERMAL CAPACITY: 3.0 million Btu/h
ANNUAL ENERGY: 6.8 billion Btu/y
DESCRIPTION: A plant that manufactures louvered doors uses geothermal for space heating.

REFERENCE: Lienau, 1986

Site No.: 277 Date Filed: 05/26/88
STATE: OR Updated:
SITE: Aq Dryers
LOCATION: Vale
APPLICATION TYPE: I
RESOURCE TEMP.: 200 F
MAX. FLOW: 60 gpm
THERMAL CAPACITY: 3.0 million Btu/h
ANNUAL ENERGY: 6.5 billion Btu/y
DESCRIPTION: A grain dryer uses a forced air hot water coil in a full bin dryer.

REFERENCE: Gannett, 1988

Site No.: 278 Date Filed: 05/26/88
STATE: OR Updated:
SITE: Klamath District Htg. System
LOCATION: Klamath Falls
APPLICATION TYPE: DH
RESOURCE TEMP.: 210 F
MAX. FLOW: 720 gpm
THERMAL CAPACITY: 2.8 million Btu/h
ANNUAL ENERGY: 6.2 billion Btu/y
DESCRIPTION: A district heating system provides space heat and DHW to 11 government buildings and a residential area. Pipe failure has temporarily discontinued service to the government buildings. However, the city plans to use the steel portion of the pipe system for commercial buildings starting with the 1988-89 heating season. A USDOE PON project.

REFERENCE: Lienau, 1986

Site No.: 279 Date Filed: 05/26/88
STATE: OR Updated:
SITE: Liskey Greenhouses
LOCATION: Klamath County
APPLICATION TYPE: G
RESOURCE TEMP.: 199 F
MAX. FLOW: 500 gpm
THERMAL CAPACITY: 2.7 million Btu/h
ANNUAL ENERGY: 5.9 billion Btu/y
DESCRIPTION: A fiberglass greenhouse of approximately 30,500 sq ft and ten aquaculture raceways use geothermal effluent for raising tropical fish.

REFERENCE: Lienau, 1986

Site No.: 280 Date Filed: 05/26/88
STATE: OR Updated:
SITE: Belknap Hot Springs
LOCATION: Lane
APPLICATION TYPE: P
RESOURCE TEMP.: 160 F
MAX. FLOW: 50 gpm
THERMAL CAPACITY: 0.9 million Btu/h
ANNUAL ENERGY: 5.5 billion Btu/y
DESCRIPTION: Belknap Hot Springs Resort and a swimming pool are heated from a geothermal well.

REFERENCE: Gannett, 1988

Site No.: 281
STATE: OR
SITE: Jackson Hot Springs
LOCATION: Ashland
APPLICATION TYPE: S, P
RESOURCE TEMP.: 111 F
MAX. FLOW: 264 gpm
THERMAL CAPACITY: 0.7 million Btu/h
ANNUAL ENERGY: 4.4 billion Btu/y
DESCRIPTION: Thermal spring is used for space heating a motel and swimming pool.

Date Filed: 05/26/88
Updated:

REFERENCE: NOAA, 1982

Site No.: 282
STATE: OR
SITE: Klamath Swimming Pools
LOCATION: Klamath Falls
APPLICATION TYPE: P
RESOURCE TEMP.: 180 F
MAX. FLOW: 0 gpm
THERMAL CAPACITY: 1.1 million Btu/h
ANNUAL ENERGY: 4.3 billion Btu/y
DESCRIPTION: Two public swimming pools are heated by geothermal water. The municipal pool uses a downhole heat exchanger, and the KU High School pool uses effluent from the space heating system.

Date Filed: 05/26/88
Updated:

REFERENCE: Lienau, 1986

Site No.: 283
STATE: OR
SITE: Breitenbush Hot Springs
LOCATION: Marion County
APPLICATION TYPE: S, P
RESOURCE TEMP.: 212 F
MAX. FLOW: 900 gpm
THERMAL CAPACITY: 1.2 million Btu/h
ANNUAL ENERGY: 3.9 billion Btu/y
DESCRIPTION: A Downhold heat exchanger is used to heat a lodge, convention center, 30 cabins, spas and a swimming pool. Two wells.

Date Filed: 05/26/88
Updated:

REFERENCE: Justus, 1979

Site No.: 284
STATE: OR
SITE: Klamath Churches (4)
LOCATION: Klamath Falls
APPLICATION TYPE: S
RESOURCE TEMP.: 190 F
MAX. FLOW: 0 gpm
THERMAL CAPACITY: 1.7 million Btu/h
ANNUAL ENERGY: 3.9 billion Btu/y
DESCRIPTION: Four churches use geothermal for space and DHW heating.

Date Filed: 05/26/88
Updated:

REFERENCE: Lienau, 1986

Site No.: 285
STATE: OR
SITE: Radium Hot Springs
LOCATION: Union
APPLICATION TYPE: S, P
RESOURCE TEMP.: 136 F
MAX. FLOW: 300 gpm
THERMAL CAPACITY: 0.6 million Btu/h
ANNUAL ENERGY: 3.6 billion Btu/y
DESCRIPTION: A thermal spring heats a residence and a swimming pool.

Date Filed: 05/26/88
Updated:

REFERENCE: Justus, 1979

Site No.: 286 Date Filed: 05/26/88
STATE: OR Updated:
SITE: Klamath Co. Shops
LOCATION: Klamath County
APPLICATION TYPE: S
RESOURCE TEMP.: 118 F
MAX. FLOW: 113 gpm
THERMAL CAPACITY: 1.6 million Btu/h
ANNUAL ENERGY: 3.6 billion Btu/y
DESCRIPTION: Klamath County shops use a radiant floor system for space heating.

REFERENCE: Lienau, 1986

Site No.: 287 Date Filed: 05/26/88
STATE: OR Updated:
SITE: YMCA
LOCATION: Klamath Falls
APPLICATION TYPE: S, P
RESOURCE TEMP.: 147 F
MAX. FLOW: 120 gpm
THERMAL CAPACITY: 1.4 million Btu/h
ANNUAL ENERGY: 3.1 billion Btu/y
DESCRIPTION: Space, DHW and a swimming pool are heated using a geothermal production well and an injection well for disposal. A USDOE PON project.

REFERENCE: Lienau, 1986

Site No.: 288 Date Filed: 05/26/88
STATE: OR Updated:
SITE: Highway De-icing
LOCATION: Klamath Falls
APPLICATION TYPE: I
RESOURCE TEMP.: 190 F
MAX. FLOW: 0 gpm
THERMAL CAPACITY: 0.4 million Btu/h
ANNUAL ENERGY: 2.5 billion Btu/y
DESCRIPTION: The heated pavement is 50 ft by 420 ft length, with three miles of 3/4 in. grid pipe used for de-icing a steepgrade approaching a stop light. A DHE is used to heat a 50-50 mixture of antifreeze to the grid.

REFERENCE: Lund, 1976

Site No.: 289 Date Filed: 05/26/88
STATE: OR Updated:
SITE: Thunderhead Lodge
LOCATION: Government Camp
APPLICATION TYPE: HP
RESOURCE TEMP.: 68 F
MAX. FLOW: 130 gpm
THERMAL CAPACITY: 1.2 million Btu/h
ANNUAL ENERGY: 2.3 billion Btu/y
DESCRIPTION: Heat pump system with a COP of 3.2 is used for space heating a condominium, DHW, and outdoor swimming pool.

REFERENCE: Lienau, 1986

Site No.: 290 Date Filed: 05/26/88
STATE: OR Updated:
SITE: Public Swimming Pool
LOCATION: Lakeview
APPLICATION TYPE: P
RESOURCE TEMP.: 180 F
MAX. FLOW: 20 gpm
THERMAL CAPACITY: 0.8 million Btu/h
ANNUAL ENERGY: 1.8 billion Btu/y
DESCRIPTION: A public swimming pool uses geothermal for pool, DHW and locker room heating.

REFERENCE: Lienau, 1986

Site No.: 291 Date Filed: 05/26/88
STATE: OR Updated:
SITE: Hot Lake RV Park
LOCATION: Union County
APPLICATION TYPE: S, P
RESOURCE TEMP.: 190 F
MAX. FLOW: 830 gpm
THERMAL CAPACITY: 0.9 million Btu/h
ANNUAL ENERGY: 1.8 billion Btu/y
DESCRIPTION: A thermal spring provides space heating to the Hot Lake Hotel and 1320 ft. transmission line delivers heat to space heating, DHW, hot tubs and a swimming pool at the RV part.

REFERENCE: Rafferty, 1986

Site No.: 292 Date Filed: 05/26/88
STATE: OR Updated:
SITE: Baker Swimming Pool
LOCATION: Baker
APPLICATION TYPE: P, HP
RESOURCE TEMP.: 75 F
MAX. FLOW: 200 gpm
THERMAL CAPACITY: 0.6 million Btu/h
ANNUAL ENERGY: 1.8 billion Btu/y
DESCRIPTION: Heat pump operating at a COP of 4.24 requiring 42 KW of electricalinput is used to heat two swimming pools and DHW.

REFERENCE: McGraw, 1984

Site No.: 293 Date Filed: 05/26/88
STATE: OR Updated:
SITE: Hunters Hot Spring
LOCATION: Lakeview
APPLICATION TYPE: S
RESOURCE TEMP.: 202 F
MAX. FLOW: 78 gpm
THERMAL CAPACITY: 0.8 million Btu/h
ANNUAL ENERGY: 1.7 billion Btu/y
DESCRIPTION: A motel is heated with geothermal fluid from one well, and another well drilled in 1923 produces a geyser which spouts about 50 ft every 40 seconds.

REFERENCE: Justus, 1979

Site No.: 294 Date Filed: 05/26/88
STATE: OR Updated:
SITE: Cove Hot Spring
LOCATION: Union County
APPLICATION TYPE: G
RESOURCE TEMP.: 108 F
MAX. FLOW: 226 gpm
THERMAL CAPACITY: 0.7 million Btu/h
ANNUAL ENERGY: 1.4 billion Btu/y
DESCRIPTION: Boise Cascade tree seedling greenhouses (7,300 sq ft) are heated from the hot springs and a public swimming pool. An animal husbandry application was added nearby in about 1981.

REFERENCE: Justus, 1979

Site No.: 295 Date Filed: 05/26/88
STATE: OR Updated:
SITE: Greenhouses
LOCATION: Vale
APPLICATION TYPE: G
RESOURCE TEMP.: 195 F
MAX. FLOW: 40 gpm
THERMAL CAPACITY: 0.6 million Btu/h
ANNUAL ENERGY: 1.3 billion Btu/y
DESCRIPTION: Greenhouses are heated by a shollow geothermal well.

REFERENCE: Gannett, 1988

Site No.: 296 Date Filed: 05/26/88
STATE: OR Updated:
SITE: Medical Hot Springs
LOCATION: Union County
APPLICATION TYPE: S, P
RESOURCE TEMP.: 140 F
MAX. FLOW: 100 gpm
THERMAL CAPACITY: 0.5 million Btu/h
ANNUAL ENERGY: 1.1 billion Btu/y
DESCRIPTION: A resort and swimming pool are geothemally heated.

REFERENCE: Justus, 1979

Site No.: 297 Date Filed: 05/26/88
STATE: OR Updated:
SITE: Austin Hot Springs
LOCATION: Clackamas
APPLICATION TYPE: P
RESOURCE TEMP.: 186 F
MAX. FLOW: 250 gpm
THERMAL CAPACITY: 0.2 million Btu/h
ANNUAL ENERGY: 1.0 billion Btu/y
DESCRIPTION: The hot springs is used for recreational bathing at a developed road side park.

REFERENCE: Loam, 1980

Site No.: 298 Date Filed: 05/26/88
STATE: OR Updated:
SITE: Lakeview Residences
LOCATION: Lakeview
APPLICATION TYPE: S
RESOURCE TEMP.: 190 F
MAX. FLOW: 50 gpm
THERMAL CAPACITY: 0.4 million Btu/h
ANNUAL ENERGY: 0.9 billion Btu/y
DESCRIPTION: Space heating for nine homes is provided by geothermal sources.

REFERENCE: Justus, 1979

Site No.: 299 Date Filed: 05/26/88
STATE: OR Updated:
SITE: Vale Slaughter House
LOCATION: Vale
APPLICATION TYPE: S
RESOURCE TEMP.: 150 F
MAX. FLOW: 20 gpm
THERMAL CAPACITY: 0.3 million Btu/h
ANNUAL ENERGY: 0.7 billion Btu/y
DESCRIPTION: Thermal water is circulated in pipes buried in concrete floor for space heating and also used for cleaning. Drilled new well - jet pump..

REFERENCE: Gannett, 1988

Site No.: 300 Date Filed: 05/26/88
STATE: OR Updated:
SITE: Vale Residences
LOCATION: Vale
APPLICATION TYPE: S
RESOURCE TEMP.: 185 F
MAX. FLOW: 24 gpm
THERMAL CAPACITY: 0.3 million Btu/h
ANNUAL ENERGY: 0.7 billion Btu/y
DESCRIPTION: Six homes are heated from wells 20 to 30 ft deep.

REFERENCE: Gannett, 1988

Site No.: 301
STATE: OR
SITE: Jackson Greenhouses
LOCATION: Ashland
APPLICATION TYPE: G
RESOURCE TEMP.: 111 F
MAX. FLOW: 100 gpm
THERMAL CAPACITY: 0.3 million Btu/h
ANNUAL ENERGY: 0.5 billion Btu/y
DESCRIPTION: Greenhouses are heated from a 450 ft well.

Date Filed: 05/26/88
Updated:

REFERENCE: Gannett, 1988

Site No.: 302
STATE: OR
SITE: Olene Gap
LOCATION: Klamath County
APPLICATION TYPE: S
RESOURCE TEMP.: 189 F
MAX. FLOW: 300 gpm
THERMAL CAPACITY: 0.1 million Btu/h
ANNUAL ENERGY: 0.1 billion Btu/y
DESCRIPTION: A home is heated from a thermal spring, and nearby a 450 ft well could produce 300 gpm at 224F. About half a dozen themal springs exist in the area.

Date Filed: 05/26/88
Updated:

REFERENCE: Sammel, 1980

Site No.: 303
STATE: OR
SITE: Langel Valley
LOCATION: Bonanza
APPLICATION TYPE: S
RESOURCE TEMP.: 147 F
MAX. FLOW: 20 gpm
THERMAL CAPACITY: 0.1 million Btu/h
ANNUAL ENERGY: 0.1 billion Btu/y
DESCRIPTION: Residence is heated by a thermal spring using a cistern type heat exchanger.

Date Filed: 05/26/88
Updated:

REFERENCE: Sammel, 1980

Site No.: 304
STATE: OR
SITE: Adrian
LOCATION: Adrian
APPLICATION TYPE: I
RESOURCE TEMP.: 168 F
MAX. FLOW: 150 gpm
THERMAL CAPACITY: 0.0 million Btu/h
ANNUAL ENERGY: 0.0 billion Btu/y
DESCRIPTION: A well has been utilized as the source of energy for an alcohol plant. The plant operated several years, but is now shut down. Recent increased demand for alcohol fuel in Boise may permit re-opening.

Date Filed: 05/26/88
Updated:

REFERENCE: Culver, 1988

Site No.: 305
STATE: OR
SITE: Summer Lake Hot Springs
LOCATION: Lake County
APPLICATION TYPE: S, A
RESOURCE TEMP.: 109 F
MAX. FLOW: 20 gpm
THERMAL CAPACITY: million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION: Space heating of two residences and a swimming pool at Summer Lake Hot Springs Resort. The Desert Springs Trout Farm reportedly uses geothermal.

Date Filed: 05/26/88
Updated:

REFERENCE: Gannett, 1988

Site No.: 306 Date Filed: 05/26/88
STATE: OR Updated:
SITE: Commercial Bldgs. (9)
LOCATION: Portland
APPLICATION TYPE: HP
RESOURCE TEMP.: F
MAX. FLOW: gpm
THERMAL CAPACITY: million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION: In downtown Portland commercial buildings using ground water heat pumps used for space heating and cooling include; 1) Blue Cross Building, 2) Calaroga Terrace (2), 3) Commonwealth Building (3), 4) Frederick and Nelson, and 5) Medical Dental Building (2).

REFERENCE: Gannett, 1988

Site No.: 307 Date Filed: 05/26/88
STATE: PA Updated:
SITE: All of State
LOCATION:
APPLICATION TYPE: HP
RESOURCE TEMP.: 50 F
MAX. FLOW: 12000 gpm
THERMAL CAPACITY: 68.4 million Btu/h
ANNUAL ENERGY: 119.8 billion Btu/y
DESCRIPTION: An estimated 2000 heat pump wells are used for space heating and cooling. The reported annual energy is only for the heating load from 1500 ground water and 400 vertical closed loop heat pumps. The remainder are horizontal closed loop heat pumps.

REFERENCE: Ellis, 1988

Site No.: 308 Date Filed: 05/26/88
STATE: PA Updated:
SITE: Factory at Masontown
LOCATION: S. of Pittsburg
APPLICATION TYPE: HP
RESOURCE TEMP.: 52 F
MAX. FLOW: 0 gpm
THERMAL CAPACITY: 1.0 million Btu/h
ANNUAL ENERGY: 1.7 billion Btu/y
DESCRIPTION: An 80 ton vertical closed loop earth coupled heat pump is used for space heating and cooling. Annual energy represents only the heating load.

REFERENCE: Ellis, 1988

Site No.: 309 Date Filed: 05/26/88
STATE: SC Updated:
SITE: All of State
LOCATION: mainly along coast
APPLICATION TYPE: HP
RESOURCE TEMP.: 67 F
MAX. FLOW: 11200 gpm
THERMAL CAPACITY: 61.2 million Btu/h
ANNUAL ENERGY: 53.6 billion Btu/y
DESCRIPTION: An estimated 1400 ground water and 300 vertical earth coupeled heat pumps are used for space heating and cooling.

REFERENCE: Ellis, 1988

Site No.: 310 Date Filed: 08/19/88
STATE: SD Updated:
SITE: Secondary Oil Recovery
LOCATION: northwestern area of SD
APPLICATION TYPE: I
RESOURCE TEMP.: 170 F
MAX. FLOW: 1000 gpm
THERMAL CAPACITY: 47.8 million Btu/h
ANNUAL ENERGY: 334.9 billion Btu/y
DESCRIPTION: Geothermal fluids are injected into oil wells to move oil toward production wells. This heat is extremely useful in increasing the recovery of up to an additional third of the original oil.

REFERENCE: Reed, 1988

Site No.: 311 Date Filed: 05/26/88
STATE: SD Updated:
SITE: Evan's Plunge
LOCATION: Hot Springs
APPLICATION TYPE: P
RESOURCE TEMP.: 87 F
MAX. FLOW: 10340 gpm
THERMAL CAPACITY: 5.2 million Btu/h
ANNUAL ENERGY: 36.2 billion Btu/y
DESCRIPTION: A large swimming pool, about the size of a football field, has natural springs in the floor.

REFERENCE: Goodman, 1988

Site No.: 312 Date Filed: 05/26/88
STATE: SD Updated:
SITE: All of State
LOCATION:
APPLICATION TYPE: HP
RESOURCE TEMP.: 47 F
MAX. FLOW: 2000 gpm
THERMAL CAPACITY: 13.5 million Btu/h
ANNUAL ENERGY: 35.5 billion Btu/y
DESCRIPTION: An estimated 250 ground water and 125 vertical closed loop earth coupled heat pump wells are used for space heating and cooling.

REFERENCE: Ellis, 1988

Site No.: 313 Date Filed: 05/26/88
STATE: SD Updated:
SITE: St. Joseph Indian School
LOCATION: Chamberlain
APPLICATION TYPE: HP
RESOURCE TEMP.: 73 F
MAX. FLOW: 935 gpm
THERMAL CAPACITY: 7.7 million Btu/h
ANNUAL ENERGY: 20.6 billion Btu/y
DESCRIPTION: Templifier water-to-water heat pumps supply 140 F water to 18 buildings (260,000 sq. ft.) to provide space heating using two wells. The effluent is discharged into the Missouri River.

REFERENCE: Gonsorcik, 1988

Site No.: 314 Date Filed: 05/26/88
STATE: SD Updated:
SITE: Philip District Heating
LOCATION: Philip
APPLICATION TYPE: DH
RESOURCE TEMP.: 155 F
MAX. FLOW: 300 gpm
THERMAL CAPACITY: 8.4 million Btu/h
ANNUAL ENERGY: 17.8 billion Btu/y
DESCRIPTION: A district heating system provides space heat and DHW to four school buildings. In addition, nine commercial buildings in the central business district of the city of Philip uses the 130F effluent from the school buildings. A treatment plant using barium chloride was constructed to remove the sulfates containing Ra226 in the geothermal fluids. A USDOE PON project.

REFERENCE: Lunis, 1987

Site No.: 315 Date Filed: 05/26/88
STATE: SD Updated:
SITE: St. Mary's Hospital
LOCATION: Pierre
APPLICATION TYPE: S
RESOURCE TEMP.: 108 F
MAX. FLOW: 385 gpm
THERMAL CAPACITY: 5.6 million Btu/h
ANNUAL ENERGY: 11.4 billion Btu/y
DESCRIPTION: Artesian well fluids pass through three plate heat exchangers to provide space and DHW to two hospital buildings. The effluent at 75 to 80F is discharged into the Missouri River. A USDOE PON project.

REFERENCE: Lunis, 1987

Site No.: 316 Date Filed: 05/26/88
STATE: SD Updated:
SITE: Lake Wagner Greenhouses
LOCATION: Philip
APPLICATION TYPE: G
RESOURCE TEMP.: 154 F
MAX. FLOW: 250 gpm
THERMAL CAPACITY: 4.3 million Btu/h
ANNUAL ENERGY: 9.3 billion Btu/y
DESCRIPTION: An artesian well, about 1.5 mi N of Philip is used to provide space heat to about one acre of greenhouses. The well has a shut-in pressure of about 100 psig and is used as the domestic water supply for Philip.

REFERENCE: Lienau, 1986

Site No.: 317 Date Filed: 05/26/88
STATE: SD Updated:
SITE: Diamond Ring Ranch Heat./Proc.
LOCATION: Haakan County
APPLICATION TYPE: S, I
RESOURCE TEMP.: 152 F
MAX. FLOW: 170 gpm
THERMAL CAPACITY: million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION: An artesian well is used to space heat six buildings, provide heat for a 700 bushel/hr grain dryer, and for stock water. System was installed and operated satisfactorily, however, ranching activities were halted and the use of the system stopped accordingly. A USDOE PON project.

REFERENCE: Lunis, 1987

Site No.: 318 Date Filed: 05/26/88
STATE: TN Updated:
SITE: All of State
LOCATION:
APPLICATION TYPE: HP
RESOURCE TEMP.: 61 F
MAX. FLOW: 840 gpm
THERMAL CAPACITY: 17.6 million Btu/h
ANNUAL ENERGY: 15.4 billion Btu/y
DESCRIPTION: An estimated 700 heat pump wells are used for space heating and cooling. The reported annual energy is only for the heat load and represents 105 ground water and 385 vertical closed loop earth coupled heat pumps. The remainder are horizontal closed loop.

REFERENCE: Ellis, 1988

Site No.: 319 Date Filed: 05/26/88
STATE: TX Updated:
SITE: All of State
LOCATION: Corpus Cristy has large unit
APPLICATION TYPE: HP
RESOURCE TEMP.: 67 F
MAX. FLOW: 3600 gpm
THERMAL CAPACITY: 147.9 million Btu/h
ANNUAL ENERGY: 129.6 billion Btu/y
DESCRIPTION: An estimated 4050 heat pump wells are used for space heating and cooling. These wells represent 11 percent ground water and 89 percent vertical earth coupled.

REFERENCE: Ellis, 1988

Site No.: 320 Date Filed: 05/26/88
STATE: TX Updated:
SITE: Cotulla High School
LOCATION: Cotulla
APPLICATION TYPE: S
RESOURCE TEMP.: 109 F
MAX. FLOW: 600 gpm
THERMAL CAPACITY: 9.9 million Btu/h
ANNUAL ENERGY: 13.0 billion Btu/y
DESCRIPTION: Water from the geothermal well (245 hp pump) is used directly in air handler fan coils in 11 buildings. Disposal is to surface. After use water goes to holding tanks where students stock and raise fish for classes in biology.

REFERENCE: Ramsey, 1988 & Vella, 1988

Site No.: 321 Date Filed: 05/26/88
STATE: TX Updated:
SITE: Stacy Park Pool
LOCATION: Austin
APPLICATION TYPE: P
RESOURCE TEMP.: 96 F
MAX. FLOW: 250 gpm
THERMAL CAPACITY: 0.9 million Btu/h
ANNUAL ENERGY: 5.5 billion Btu/y
DESCRIPTION: An outdoor pool approximately 100' x 40' is headed between early fall and late spring by a 240' pumped well. Pool is maintained at 82-84F most of the time; warmer some days.

REFERENCE: Austin Park, 1988; C. Wicker

Site No.: 322 Date Filed: 05/26/88
STATE: TX Updated:
SITE: Navarro College
LOCATION: Corsicana, TX
APPLICATION TYPE: G, A
RESOURCE TEMP.: 126 F
MAX. FLOW: gpm
THERMAL CAPACITY: million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION: A geothermal well supplied heat for a combined greenhouse aquaculture project. Disposal was to an injection well, which failed. The project is no longer in operation.

REFERENCE: Culver, 1988

Site No.: 323 Date Filed: 05/26/88
STATE: TX Updated:
SITE: Marlin Hospital
LOCATION: Marlin
APPLICATION TYPE: S
RESOURCE TEMP.: F
MAX. FLOW: gpm
THERMAL CAPACITY: million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION: The hospital has a geothermal heating system that preforms well. However, the small hospital was recently closed. A USDOE PON project.

REFERENCE: BEG, 1988

Site No.: 324 Date Filed: 05/26/88
STATE: UT Updated:
SITE: Tryo Hygro (28a. under constr)
LOCATION: Newcastle
APPLICATION TYPE: G
RESOURCE TEMP.: 230 F
MAX. FLOW: 246 gpm
THERMAL CAPACITY: 138.0 million Btu/h
ANNUAL ENERGY: 471.0 billion Btu/y
DESCRIPTION: Currently there are three operators with a total of 2.8 acres of greenhouses. Troy Hygro .75 acres, Hildebrand 1.2 acres, Anslone 1.8 acres; 12 million Btu/hr, and 30 billion Btu/yr. Troy Hygro is in the process of drilling additional wells and adding 28 acres of greenhouses plus warehousing, packaging offices, etc.

REFERENCE: Lienau, 1986; Troy Hygro, 1988 .

Site No.: 325 Date Filed: 05/26/88
STATE: UT Updated:
SITE: LDS Office Building
LOCATION: Salt Lake City
APPLICATION TYPE: HP
RESOURCE TEMP.: 60 F
MAX. FLOW: 0 gpm
THERMAL CAPACITY: 27.0 million Btu/h
ANNUAL ENERGY: 47.3 billion Btu/y
DESCRIPTION: Three 750 ton groundwater-source heat pumps provide space heat and cooling to a 683,000 sq. ft. office building. Four wells (two production and two injection) are used.

REFERENCE: Culver, 1988

Site No.: 326 Date Filed: 05/26/88
STATE: UT Updated:
SITE: Utah Ross
LOCATION: Sandy
APPLICATION TYPE: G
RESOURCE TEMP.: 124 F
MAX. FLOW: 1200 gpm
THERMAL CAPACITY: 20.4 million Btu/h
ANNUAL ENERGY: 44.6 billion Btu/y
DESCRIPTION: 4.6 acres of greenhouses producing cut roses. Various heating systems. 25% utilization factor. A USDOE PON project.

REFERENCE: Land, 1988; Lienau, 1986

Site No.: 327 Date Filed: 05/26/88
STATE: UT Updated:
SITE: Como Springs Resort
LOCATION: Morgan
APPLICATION TYPE: P
RESOURCE TEMP.: 82 F
MAX. FLOW: 540 gpm
THERMAL CAPACITY: 1.1 million Btu/h
ANNUAL ENERGY: 37.8 billion Btu/y
DESCRIPTION: This resort has two outdoor swimming pools, cabins, restaurant, RV park, etc. Open Memorial Day through Labor Day.

REFERENCE: Blacket, 1988; Rex Heiner, own

Site No.: 328 Date Filed: 05/26/88
STATE: UT Updated:
SITE: Utah Roses
LOCATION: Bluffdale
APPLICATION TYPE: G
RESOURCE TEMP.: 190 F
MAX. FLOW: 400 gpm
THERMAL CAPACITY: 10.4 million Btu/h
ANNUAL ENERGY: 32.0 billion Btu/y
DESCRIPTION: Three acres of greenhouses growing cut roses. Disposal to injection well. A USDOE PON project.

REFERENCE: Kenkeremath, 1985

Site No.: 329 Date Filed: 05/26/88
STATE: UT Updated:
SITE: Crystal Hot Springs
LOCATION: Honeyville
APPLICATION TYPE: P, A
RESOURCE TEMP.: 140 F
MAX. FLOW: 1800 gpm
THERMAL CAPACITY: 3.5 million Btu/h
ANNUAL ENERGY: 21.4 billion Btu/y
DESCRIPTION: Outdoor and indoor swimming pools and water slide. A water park with 13 various sized pools, including one olympic size. Radiant floor heating in 4800 sq ft of buildings and additional in sidewalks. Aquaculture raising 10,000 trout and experimenting with shrimp.

REFERENCE: Mabey, 1988

Site No.: 330 Date Filed: 05/26/88
STATE: UT Updated:
SITE: Utah State Prison
LOCATION: Near Salt Lake City
APPLICATION TYPE: S, DHW
RESOURCE TEMP.: 178 F
MAX. FLOW: 500 gpm
THERMAL CAPACITY: 7.0 million Btu/h
ANNUAL ENERGY: 15.3 billion Btu/y
DESCRIPTION: Space and domestic water heating for a portion of the prison. A USDOE PON project.

REFERENCE: Lienau, 1986

Site No.: 331 Date Filed: 05/26/88
STATE: UT Updated:
SITE: Saratoga Springs Resort
LOCATION: Lehi
APPLICATION TYPE: S, P
RESOURCE TEMP.: 120 F
MAX. FLOW: 150 gpm
THERMAL CAPACITY: 2.0 million Btu/h
ANNUAL ENERGY: 8.7 billion Btu/y
DESCRIPTION: A lakeside recreation resort. Two outdoor swimming pools, one diving pool, two slide and spash pools. Water for showers at the resort and space heating of 2 homes using radiant heat, 30 acre resort area.

REFERENCE: Eastmond, 1988

Site No.: 332 Date Filed: 05/26/88
STATE: UT Updated:
SITE: Monroe Hot Springs
LOCATION: Monroe
APPLICATION TYPE: P, S, G
RESOURCE TEMP.: 164 F
MAX. FLOW: 600 gpm
THERMAL CAPACITY: 1.0 million Btu/h
ANNUAL ENERGY: 7.8 billion Btu/y
DESCRIPTION: Monroe Hot Springs presently is like a municipal plunge with an excellent restaurant. Swimming pool water is heated with a heat exchanger. Soaking pools use the water from the springs. The owners are hoping to expand into a major destination resort complex, with all space geothermally heated. Also greenhouses and aquaculture. Resource currently under utilized.

REFERENCE: Culver, 1988

Site No.: 333 Date Filed: 05/26/88
STATE: UT Updated:
SITE: Belmont Springs
LOCATION: Plymouth
APPLICATION TYPE: P
RESOURCE TEMP.: 131 F
MAX. FLOW: 3600 gpm
THERMAL CAPACITY: 1.5 million Btu/h
ANNUAL ENERGY: 7.8 billion Btu/y
DESCRIPTION: A family style resort with outdoor pool and 3 outdoor soaking pools and jet pools, RV park, golf course, etc. Also growing tropical fish. Open 6 mos/yr., resource under utilized.

REFERENCE: Holmgren, 1988

Site No.: 334 Date Filed: 05/26/88
STATE: UT Updated:
SITE: Veyo Resort
LOCATION: 18 mi N. of St. George
APPLICATION TYPE: P
RESOURCE TEMP.: 98 F
MAX. FLOW: 120 gpm
THERMAL CAPACITY: 1.0 million Btu/h
ANNUAL ENERGY: 4.2 billion Btu/y
DESCRIPTION: Outdoor swimming pool and picnic park, cafe and RV park. Pool at 82-84F, 35 ft x 70 ft. Open March through September.

REFERENCE: Loam, 1980; Blacket, 1988

Site No.: 335 Date Filed: 05/26/88
STATE: UT Updated:
SITE: Pah Tempe
LOCATION: 2 mi N of Hurricane
APPLICATION TYPE: P, S
RESOURCE TEMP.: 108 F
MAX. FLOW: 10000 gpm
THERMAL CAPACITY: 0.4 million Btu/h
ANNUAL ENERGY: 2.4 billion Btu/y
DESCRIPTION: A resort with an outdoor swimming pool and natural and man-made soaking tubs. Use heat exchangers to heat swimming pool and shower water. Radiant floor heat in one small area. Resource underutilized.

REFERENCE: Anderson, 1988

Site No.: 336 Date Filed: 05/26/88
STATE: UT Updated:
SITE: The Homestead
LOCATION: Midway
APPLICATION TYPE: P
RESOURCE TEMP.: 95 F
MAX. FLOW: 60 gpm
THERMAL CAPACITY: 0.1 million Btu/h
ANNUAL ENERGY: 2.0 billion Btu/y
DESCRIPTION: A destination resort hotel with outdoor and indoor swimming pools and soaking pools. Currently geothermal used only in 3 soaking pools. Investigating use for snow melting in sidewalks.

REFERENCE: Karrat, 1988

Site No.: 337 Date Filed: 05/26/88
STATE: UT Updated:
SITE: Mountain Spa Resort
LOCATION: Midway
APPLICATION TYPE: P
RESOURCE TEMP.: 115 F
MAX. FLOW: 1268 gpm
THERMAL CAPACITY: 0.5 million Btu/h
ANNUAL ENERGY: 1.7 billion Btu/y
DESCRIPTION: An old resort with an outdoor swimming pool, indoor swimming pool and soaking pools. Open only during May - October. Resource grossly underutilized.

REFERENCE: Kaysing, 1988; Blacket, 1988

Site No.: 338 Date Filed: 05/26/88
STATE: VA Updated:
SITE: All of State
LOCATION: mainly along coast
APPLICATION TYPE: HP
RESOURCE TEMP.: 59 F
MAX. FLOW: 4000 gpm
THERMAL CAPACITY: 36.0 million Btu/h
ANNUAL ENERGY: 63.1 billion Btu/y
DESCRIPTION: An estimated 500 ground water and 500 vertical earth coupled heat pumps are used for space heating and cooling.

REFERENCE: Ellis, 1988

Site No.: 339 Date Filed: 05/26/88
STATE: VA Updated:
SITE: Homestead Resort
LOCATION: Hot Springs
APPLICATION TYPE: S, HP, P
RESOURCE TEMP.: 104 F
MAX. FLOW: 223 gpm
THERMAL CAPACITY: 1.1 million Btu/h
ANNUAL ENERGY: 2.9 billion Btu/y
DESCRIPTION: Thermal spring is used for space heating a ten room hotel and pools using the fluid directly and with a heat pump.

REFERENCE: Waldeck, 1988

Site No.: 340 Date Filed: 05/26/88
STATE: WA Updated:
SITE: Clark College
LOCATION: Vancouver
APPLICATION TYPE: HP
RESOURCE TEMP.: 55 F
MAX. FLOW: 850 gpm
THERMAL CAPACITY: 6.8 million Btu/h
ANNUAL ENERGY: 13.8 billion Btu/y
DESCRIPTION: Space heating and cooling of 15 buildings is accomplished by a water-to-water heat pump, utilizing a production and injection well.

REFERENCE: Bloomquist, 1988

Site No.: 341 Date Filed: 05/26/88
STATE: WA Updated:
SITE: Grant County Courthouse
LOCATION: Ephrata
APPLICATION TYPE: HP
RESOURCE TEMP.: 84 F
MAX. FLOW: 600 gpm
THERMAL CAPACITY: 3.7 million Btu/h
ANNUAL ENERGY: 8.4 billion Btu/y
DESCRIPTION: A heat pump operates at a COP of 5.77 and requires 188 KW electrical input for space heating and cooling. Project was developed with a HUD grant.

REFERENCE: McGraw, 1985

Site No.: 342 Date Filed: 05/26/88
STATE: WA Updated:
SITE: Yakima County Jail
LOCATION: Yakima
APPLICATION TYPE: HP
RESOURCE TEMP.: 76 F
MAX. FLOW: 700 gpm
THERMAL CAPACITY: 3.6 million Btu/h
ANNUAL ENERGY: 7.3 billion Btu/y
DESCRIPTION: Heat pump system is used for space heating and cooling the 120,000 sq ft facility using an 800 ft production well and 600 ft injection well as the energy source.

REFERENCE: DeLuca, 1988

Site No.: 343 Date Filed: 05/26/88
STATE: WA Updated:
SITE: Chinook Tower
LOCATION: Yakima
APPLICATION TYPE: HP
RESOURCE TEMP.: 60 F
MAX. FLOW: 500 gpm
THERMAL CAPACITY: 3.1 million Btu/h
ANNUAL ENERGY: 6.6 billion Btu/y
DESCRIPTION: Heat pump system heats a 14-story building (125,000 sq ft) using two production wells and one injection well for $0.99/sq ft - yr.

REFERENCE: DeLuca, 1988

Site No.: 344 Date Filed: 05/26/88
STATE: WA Updated:
SITE: Cowlite Co. Courthouse
LOCATION: Kelso
APPLICATION TYPE: HP
RESOURCE TEMP.: 55 F
MAX. FLOW: 400 gpm
THERMAL CAPACITY: 3.0 million Btu/h
ANNUAL ENERGY: 6.0 billion Btu/y
DESCRIPTION: Ground water heat pump system provides space heating and cooling.

REFERENCE: Bloomquist, 1988

Site No.: 345 Date Filed: 05/26/88
STATE: WA Updated:
SITE: Sundown M Ranch
LOCATION: Yakima
APPLICATION TYPE: HP
RESOURCE TEMP.: 70 F
MAX. FLOW: 180 gpm
THERMAL CAPACITY: 1.8 million Btu/h
ANNUAL ENERGY: 3.7 billion Btu/y
DESCRIPTION: This Rehab Center (65,000 sq ft) is heated by a ground water heat pump for $0.63/sq ft - yr.

REFERENCE: DeLuca, 1988

Site No.: 346 Date Filed: 05/26/88
STATE: WA Updated:
SITE: Sol Duc Hot Springs
LOCATION: Clallam County
APPLICATION TYPE: P
RESOURCE TEMP.: 128 F
MAX. FLOW: 50 gpm
THERMAL CAPACITY: 0.5 million Btu/h
ANNUAL ENERGY: 1.2 billion Btu/y
DESCRIPTION: A large swimming pool and mineral pool are heated with thermal spring water and is being operated by a concession aire for the Olympic National Park.

REFERENCE: Bloomquist, 1979

Site No.: 347 Date Filed: 05/26/88
STATE: WA Updated:
SITE: Adams Co. Fire Station
LOCATION: Othello
APPLICATION TYPE: HP
RESOURCE TEMP.: 80 F
MAX. FLOW: 10 gpm
THERMAL CAPACITY: 0.2 million Btu/h
ANNUAL ENERGY: 0.2 billion Btu/y
DESCRIPTION: A ground water heat pump system used to provide space heating and cooling, with a simple payback of 6.8 years, for a fire station.

REFERENCE: Rafferty, 1982

Site No.: 348 Date Filed: 05/26/88
STATE: WA Updated:
SITE: Casey House
LOCATION: Yakima
APPLICATION TYPE: HP
RESOURCE TEMP.: 70 F
MAX. FLOW: 10 gpm
THERMAL CAPACITY: 0.1 million Btu/h
ANNUAL ENERGY: 0.2 billion Btu/y
DESCRIPTION: Ground water heat pump system used for space heating and cooling.

REFERENCE: DeLuca, 1988

Site No.: 349 Date Filed: 05/26/88
STATE: WA Updated:
SITE: Farm Credit Services Bldg.
LOCATION: Yakima
APPLICATION TYPE: HP
RESOURCE TEMP.: 0 F
MAX. FLOW: 0 gpm
THERMAL CAPACITY: 0.0 million Btu/h
ANNUAL ENERGY: 0.0 billion Btu/y
DESCRIPTION: Ground water heat pump system used for space heating and cooling.

REFERENCE: DeLuca, 1988

Site No.: 350 Date Filed: 05/26/88
STATE: WA Updated:
SITE: Skove Bldg.
LOCATION: Yakima
APPLICATION TYPE: HP
RESOURCE TEMP.: F
MAX. FLOW: gpm
THERMAL CAPACITY: million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION: Ground water heat pump system used for space heating and cooling.

REFERENCE: DeLuca, 1988

Site No.: 351 Date Filed: 05/26/88
STATE: WA Updated:
SITE: Dept. of Health & Social Serv.
LOCATION: Yakima
APPLICATION TYPE: HP
RESOURCE TEMP.: 56 F
MAX. FLOW: gpm
THERMAL CAPACITY: million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION: Ground water heat pump system uses a geothermal well for space heating and cooling.

REFERENCE: DeLuca, 1988

Site No.: 352 Date Filed: 05/26/88
STATE: WA Updated:
SITE: Nazarene Church
LOCATION: Yakima
APPLICATION TYPE: HP
RESOURCE TEMP.: F
MAX. FLOW: gpm
THERMAL CAPACITY: million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION: Ground water heat pump system, used for space heating and cooling.

REFERENCE: DeLuca, 1988

Site No.: 353 Date Filed: 05/26/88
STATE: WA Updated:
SITE: Grant Co. PUD
LOCATION: Ephrata
APPLICATION TYPE: HP
RESOURCE TEMP.: 80 F
MAX. FLOW: gpm
THERMAL CAPACITY: million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION: Ground water heat pump provides space heating.

REFERENCE: Bloomquist, 1988

Site No.: 354 Date Filed: 05/26/88
STATE: WA Updated:
SITE: Red Cross Bldg.
LOCATION: Yakima
APPLICATION TYPE: HP
RESOURCE TEMP.: F
MAX. FLOW: gpm
THERMAL CAPACITY: million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION: Ground water heat pump system used for space heating and cooling.

REFERENCE: DeLuca, 1988

Site No.: 355 Date Filed: 05/26/88
STATE: WA Updated:
SITE: Uelikamje, Moore & Shone, Inc.
LOCATION: Yakima
APPLICATION TYPE: HP
RESOURCE TEMP.: F
MAX. FLOW: gpm
THERMAL CAPACITY: million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION: Ground water heat pump system used for space heating and cooling.

REFERENCE: DeLuca, 1988

Site No.: 356 Date Filed: 05/26/88
STATE: WA Updated:
SITE: Elephant House at Zoo
LOCATION: Tacoma
APPLICATION TYPE: HP
RESOURCE TEMP.: F
MAX. FLOW: gpm
THERMAL CAPACITY: million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION: Ground water heat pump system uses a geothermal well.

REFERENCE: Bloomquist, 1988

Site No.: 357 Date Filed: 05/26/88
STATE: WI Updated:
SITE: All of State
LOCATION:
APPLICATION TYPE: HP
RESOURCE TEMP.: 46 F
MAX. FLOW: 13600 gpm
THERMAL CAPACITY: 720.0 million Btu/h
ANNUAL ENERGY: 189.2 billion Btu/y
DESCRIPTION: An estimated 2000 heat pump wells are used for space heating and cooling. These wells represent 85 percent ground water and 15 percent vertical closed-loop ground coupled heat pumps. The reported annual energy is only for the heating load.

REFERENCE: Ellis, 1988

Site No.: 358 Date Filed: 05/26/88
STATE: WY Updated: 08/19/88
SITE: Secondary Oil Recovery
LOCATION: Near Medwest (Natrona Co.)
APPLICATION TYPE: I
RESOURCE TEMP.: 200 F
MAX. FLOW: 8300 gpm
THERMAL CAPACITY: 498.3 million Btu/h
ANNUAL ENERGY: 3492.1 billion Btu/y
DESCRIPTION: At several locations geothermal water is used to provide heat to surface facilities for oil separation and is injected for secondary oil recovery from oil well. This heat is extremely useful in increasing the recovery of up to an additional third of the original oil.

REFERENCE: Reed, 1988

Site No.: 359 Date Filed: 05/26/88
STATE: WY Updated: 07/20/88
SITE: Hot Springs State Park
LOCATION: Termopolis
APPLICATION TYPE: P
RESOURCE TEMP.: 135 F
MAX. FLOW: 3120 gpm
THERMAL CAPACITY: 54.6 million Btu/h
ANNUAL ENERGY: 382.6 billion Btu/y
DESCRIPTION: Six commercial establishments within the park have a variety of outdoor and indoor pools, soaking pools, tubs and saunas.

REFERENCE: Loam, 1980

Site No.: 360 Date Filed: 05/26/88
STATE: WY Updated: 07/20/88
SITE: Paynes Fountain of Youth RV Pk
LOCATION: Thermopolis
APPLICATION TYPE: P
RESOURCE TEMP.: 125 F
MAX. FLOW: 1220 gpm
THERMAL CAPACITY: 15.2 million Btu/h
ANNUAL ENERGY: 106.5 billion Btu/y
DESCRIPTION: Football field sized outdoor pool at older RV park, supplied by a 900 ft well drilled in 1918 known as the Sackjawea Wells.

REFERENCE: Breckenridge, 1988; Loam, 1980

Site No.: 361
STATE: WY
SITE: The Saratoga Inn
LOCATION: Saratoga
APPLICATION TYPE: P
RESOURCE TEMP.: 114 F
MAX. FLOW: 450 gpm
THERMAL CAPACITY: 4.5 million Btu/h
ANNUAL ENERGY: 31.5 billion Btu/y
DESCRIPTION: A golf and tennis resort with a large outdoor pool.

Date Filed: 05/26/88
Updated:

REFERENCE: Kaysing, 1985; Loam, 1980

Site No.: 362
STATE: WY
SITE: Huckelberry Hot Springs
LOCATION: Grand Teton Nat'l Park
APPLICATION TYPE: P, I
RESOURCE TEMP.: 140 F
MAX. FLOW: 300 gpm
THERMAL CAPACITY: 4.2 million Btu/h
ANNUAL ENERGY: 29.4 billion Btu/y
DESCRIPTION: Commercial resort on leased land in the park. A large outdoor swimming pool, store, RV park, etc. Geothermal water is also used in the laundry.

Date Filed: 05/26/88
Updated:

REFERENCE: Kaysing, 1985

Site No.: 363
STATE: WY
SITE: Hobo Pool
LOCATION: Saratoga
APPLICATION TYPE: P
RESOURCE TEMP.: 118 F
MAX. FLOW: 120 gpm
THERMAL CAPACITY: 3.0 million Btu/h
ANNUAL ENERGY: 21.0 billion Btu/y
DESCRIPTION: A large (30' x 40') improved soaking pool supplied by a spring and maintained by the city, and a large municipal swimming pool supplied from an artesian well.

Date Filed: 05/26/88
Updated:

REFERENCE: James, 1979

Site No.: 364
STATE: WY
SITE: Jackson National Fish Hatchery
LOCATION: Jackson
APPLICATION TYPE: A
RESOURCE TEMP.: 78 F
MAX. FLOW: 100 gpm
THERMAL CAPACITY: 1.9 million Btu/h
ANNUAL ENERGY: 16.6 billion Btu/y
DESCRIPTION: A 78F well pumping 100 gpm is used in a ground water heat pump to heat the hatchery building (10,000 sq ft), 400,000 Btu/hr. The water then is mixed with 46F water to heat flow thru rearing ponds.

Date Filed: 05/26/88
Updated:

REFERENCE:

Site No.: 365
STATE: WY
SITE: Chief Washakie Plunge
LOCATION: Fort Washakie
APPLICATION TYPE: P
RESOURCE TEMP.: 111 F
MAX. FLOW: 150 gpm
THERMAL CAPACITY: 2.0 million Btu/h
ANNUAL ENERGY: 13.6 billion Btu/y
DESCRIPTION: Plunge and recreation area operated by the Shoshone and Arapahoe Indian Tribes. Open to the public (fee). Very large outdoor pools.

Date Filed: 05/26/88
Updated:

REFERENCE: Breckenridge, 1988

Site No.: 366
STATE: WY
SITE: Cody Athletic Club
LOCATION: Cody
APPLICATION TYPE: P
RESOURCE TEMP.: 102 F
MAX. FLOW: 250 gpm
THERMAL CAPACITY: 1.5 million Btu/h
ANNUAL ENERGY: 10.5 billion Btu/y
DESCRIPTION: Fully equipped health club and motel with large outdoor pool.

Date Filed: 05/26/88
Updated:

REFERENCE: Heasler, 1988

Site No.: 367
STATE: WY
SITE: Bronze Boot Spa
LOCATION: Near Cody
APPLICATION TYPE: P
RESOURCE TEMP.: 102 F
MAX. FLOW: 208 gpm
THERMAL CAPACITY: 1.2 million Btu/h
ANNUAL ENERGY: 8.8 billion Btu/y
DESCRIPTION: Water from the well is used in the flow-through swimming pool.

Date Filed: 05/26/88
Updated:

REFERENCE: Breckenridge, 1988

Site No.: 368
STATE: WY
SITE: DeMaris Hot Springs
LOCATION: Near Cody
APPLICATION TYPE: P
RESOURCE TEMP.: 97 F
MAX. FLOW: 400 gpm
THERMAL CAPACITY: 1.0 million Btu/h
ANNUAL ENERGY: 7.0 billion Btu/y
DESCRIPTION: At the site of an old resort an indian alcohol and drug rehabilitation center is under construction. Geothermal water will be used in a swimming pool, soaking pools and tubs. Probably not the entire flow will be utilized.

Date Filed: 05/26/88
Updated:

REFERENCE: Easton, 1988

Site No.: 369
STATE: WY
SITE: Astoria Mineral Hot Springs
LOCATION: 17 mi. So. of Jackson
APPLICATION TYPE: P
RESOURCE TEMP.: 104 F
MAX. FLOW: 100 gpm
THERMAL CAPACITY: 1.0 million Btu/h
ANNUAL ENERGY: 6.6 billion Btu/y
DESCRIPTION: A modern resort with outdoor pool, store, RV park, etc.

Date Filed: 05/26/88
Updated:

REFERENCE: Breckenridge, 1988

Site No.: 370
STATE: WY
SITE: Auburn Hot Spring
LOCATION: Near Auburn
APPLICATION TYPE: P
RESOURCE TEMP.: 144 F
MAX. FLOW: 37 gpm
THERMAL CAPACITY: 0.8 million Btu/h
ANNUAL ENERGY: 5.7 billion Btu/y
DESCRIPTION: Used to heat a private swimming pool.

Date Filed: 05/26/88
Updated:

REFERENCE: James, 1979; Breckenridge, 198

Site No.: 371 Date Filed: 05/26/88
STATE: WY Updated:
SITE: Jackalope Plunge
LOCATION: 1 mi. So. of Douglas
APPLICATION TYPE: P
RESOURCE TEMP.: 86 F
MAX. FLOW: 800 gpm
THERMAL CAPACITY: 0.4 million Btu/h
ANNUAL ENERGY: 2.7 billion Btu/y
DESCRIPTION: Douglas Warm Spring is piped two miles into the pool. The pool uses 390 gpm.

REFERENCE: James, 1979

Site No.: 372 Date Filed: 05/26/88
STATE: WY Updated:
SITE: Frank Nixon Residence
LOCATION: Saratoga
APPLICATION TYPE: P
RESOURCE TEMP.: 118 F
MAX. FLOW: 35 gpm
THERMAL CAPACITY: 0.3 million Btu/h
ANNUAL ENERGY: 2.1 billion Btu/y
DESCRIPTION: Well used to heat pool at residence.

REFERENCE: James, 1979

Site No.: 373 Date Filed: 05/26/88
STATE: WY Updated:
SITE: Steele Hot Springs
LOCATION: 8 mi. E of Bouder-Sublette Co
APPLICATION TYPE: P
RESOURCE TEMP.: 102 F
MAX. FLOW: 25 gpm
THERMAL CAPACITY: 0.2 million Btu/h
ANNUAL ENERGY: 1.8 billion Btu/y
DESCRIPTION: Used to heat a large privately owned swimming pool and a small soaking pool.

REFERENCE: Breckenridge, 1988

Site No.: 374 Date Filed: 05/26/88
STATE: WY Updated:
SITE: Countryman Well
LOCATION: Near Lander
APPLICATION TYPE: G, A
RESOURCE TEMP.: 98 F
MAX. FLOW: 500 gpm
THERMAL CAPACITY: 0.4 million Btu/h
ANNUAL ENERGY: 1.6 billion Btu/y
DESCRIPTION: A small (3200 sq ft) commercial greenhouse and tropical fish raising uses a protion of the flow (est. 50 gpm)

REFERENCE: Breckenridge, 1988

Site No.: 375 Date Filed: 05/26/88
STATE: WY Updated:
SITE: Van Norman residence
LOCATION: Thermopolis
APPLICATION TYPE: S
RESOURCE TEMP.: 124 F
MAX. FLOW: 0 gpm
THERMAL CAPACITY: 0.0 million Btu/h
ANNUAL ENERGY: 0.6 billion Btu/y
DESCRIPTION: Used for heating the Van Norman home.

REFERENCE: Breckenridge, 1988

Site No.: 376 Date Filed: 05/26/88
STATE: WY Updated:
SITE: I-80 16th St. off ramp
LOCATION: Cheyenne
APPLICATION TYPE: I
RESOURCE TEMP.: 47 F
MAX. FLOW: 0 gpm
THERMAL CAPACITY: 0.9 million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION: Three hundred forty 100-ft deep wells with down-hole heat exchangers circulate ammonia in a closed-loop highway de-icing system.

REFERENCE: Nydahl, 1988

Site No.: 377 Date Filed: 05/26/88
STATE: WY Updated:
SITE: East Grand St. Bridge
LOCATION: Laramie
APPLICATION TYPE: I
RESOURCE TEMP.: 47 F
MAX. FLOW: 0 gpm
THERMAL CAPACITY: 0.2 million Btu/h
ANNUAL ENERGY: billion Btu/y
DESCRIPTION: Sixty 100-ft deep wells with down-hole heat exchangers circulate ammonia in a closed-loop highway de-icing system.

REFERENCE: Nydahl, 1988
