

CHAPTER VI. REGIONS, STATES AND LOCAL GOVERNMENTS, AND INDIAN TRIBES

A. REGIONS I, II, III, IV, V, AND VII

Both hydrothermal and hot dry rock geothermal prospects have been identified by Federal programs for selected geological provinces in more than half of the eastern United States. Regional scenarios have determined existing and potential markets for moderate-temperature hydrothermal resources, broadly for the eastern Gulf Coastal Plain states, and in detail for the mid-Atlantic Coastal Plain states.

Activity in the eastern United States has been primarily Federal to date; however, regional, state, and private programs are beginning. State-coupled programs exist in Delaware, Mississippi, Alabama, Nebraska, Kansas, and New York. To set the stage for orderly development and application of the hydrothermal resources under the Atlantic Coastal Plain, the individual states must consider the legal aspects of ownership, insurance, permitting, access, reservoir management, etc.

The state of Maryland passed a Geothermal Resources Act in 1978, but has yet to issue the attendant rules and regulations. Further, no user has yet applied to force a determination of ownership left ambiguous by the current law.

Maryland

The state of Maryland developed and passed a Geothermal Act in 1978 and is currently drafting implementing rules and regulations under the Water Resources Division of the Department of Natural Resources. A format for a State Site Prospectus for development of geothermal energy has been developed and the state plans to complete the Site Prospectus as data become available. A team to coordinate state geothermal activities and draft the state prospectus is in the process of formulation.

The Campbell Soup Company of Salisbury, together with the consulting engineering company of Burns and Roe, will evaluate geothermal energy for its frozen dinner plant in Salisbury, Maryland.

The private sector has expressed interest in:

- Geothermal vaporization of Liquefied Natural Gas delivered at Cove Point, Maryland, prior to delivery to gas pipelines (The operating company is the Columbia Gas Company.)
- Geothermal space heating of the rebuilt downtown of Salisbury, Maryland

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- Geothermal space heating of schools and hospitals under energy conservation grants in Wicomico, Somerset, and Worcester Counties
- Mariculture of oysters and clams in a mixture of geothermal and Chesapeake Bay water by the University of Maryland and the Ceda Corporation.

Delaware

The Delaware legislature and energy committee are in the process of drafting a geothermal law. They have held workshops with the National Conference of State Legislatures (NCSL) and interested parties in the state.

The town of Lewes, Delaware, is considering the use of geothermal energy for space conditioning of schools and hospital; heating sea water for shellfish production at the University of Delaware Marine Culture Laboratory; the recovery of chemicals from the geothermal fluid, and use as process water in a fish processing industry.

Virginia

The state of Virginia has been conducting workshops with NCSL to evaluate the present legal and regulatory framework within the state in reference to the development of geothermal energy.

A generic State Site Prospectus has been developed and a state geothermal development team is being formed to add more details as data become available.

Pennsylvania

There are individual expressions of interest in geothermal heating in Pennsylvania. In New Hope, Pennsylvania, a residential home builder is exploring the region for higher than normal temperature, modest depth, ground water for water to water heat pumps for space conditioning. In Scranton, Pennsylvania, a developer is evaluating the use of water in flooded mines with heat pumps to space condition a shopping center.

New York

Discussions with the town of Auburn, New York, are in process to assess the potential of geothermal energy and its application in the area.

Vermont

The town of Bellows Falls, Vermont, is assessing the potential of using glacial fill along the Connecticut River near the center of town as a storage median for warm river water, to be used in the winter with heat pumps to heat sections of downtown.

Alabama

The Tuscaloosa Formation, which underlies much of southern Alabama, has been used for years as a source of hot water for balneology. At Cottonwood, Alabama, there was a health spa for many years, and near Dothan, Alabama, at the Olympia Spa the waters are used as a recreation facility. The Tuscaloosa is at modest depth 3000 feet with modest temperatures (51°C).

B. REGIONS VI AND VIII

A market penetration analysis, showing near and far term potential in each of the ten states in these regions found that geothermal penetration is most likely in the residential and commercial sectors, and considerably less likely in the industrial sector.

Colorado

Colorado has undertaken extensive outreach programming and has uncovered several candidates for community and industrial project applications of hydrothermal resources. Coury and Associates, Inc., has been awarded a \$248,000 grant by the Four Corners Regional Commission for a comprehensive evaluation of geothermal resources and applications in the San Luis Valley of Colorado.

Montana

The Montana Department of Natural Resources and Conservation mapped potential geothermal use, showing population distribution, resource location, and agricultural areas where processing facilities might be built. The Department also is seeking 10-to-1 matching funds totaling \$220,000 for a resource assessment program in six valleys of Montana. The proposed projects would be conducted by the Montana School of Mines.

New Mexico

The New Mexico Energy and Minerals Department has awarded a \$37,000 grant to Coupland, Moran & Associates to start a drilling program at Jemez Springs, which will assess the low-temperature geothermal potential for district heating system. If successful, the activity will be expanded to assess the resource for agribusiness applications—e.g., a sawmill for timber production. The Department also has authorized \$45,000 to assist development of geothermal space heating of a hosiery company at Las Cruces.

The New Mexico Research and Development Committee awarded \$21,000 to a geothermally heated greenhouse in Silver City and \$40,000 to a Taos County project demonstrating use of geothermal spring waters for year-round crop production in a solar-assisted greenhouse.

Truth or Consequences is attempting to develop a plan for the retrofit of city buildings for geothermal space heating.

The New Mexico Energy Institute published "The Geothermal Option," a one-time publication containing technical information on geothermal resources and applications.

North Dakota

The State resource team has begun a program of resource assessment as part of the Western States Cooperative Program.

South Dakota

The city of Lemmon is moving aggressively to use the Madison aquifer's geothermal waters for residential, commercial, and industrial applications. The first well drilling found 82°C water at a depth of about 6,000 feet.

Utah

McCullough has announced an agreement for a partnership with Roosevelt Hot Springs Geothermal, Inc., and has applied to drill wells in the area.

The Utah Geological Mineral and Survey has a new publication on Geothermal Waters of Utah.

Wyoming

The Wyoming State Coupled Resource Assessment Contract has been signed with the Wyoming Geological Survey.

Commercial ventures and site specific development plan for a gasohol plant in Cody area: the Wyoming resource assessment team drilled six temperature gradient holes 500-700 feet deep in late FY 79. Private parties developing the plant are prepared to drill well holes this summer. Recent field data indicates water temperatures of 77°-93°C—16 degrees higher than previously thought. A Cincinnati engineering firm is conducting preliminary engineering feasibility studies for a gasohol plant. A corporation has formed to develop and operate the plant, at a projected cost of \$50 million.

C. REGION IX

Arizona

In the state government, primary emphasis is currently on testing the resource. The New Mexico Bureau of Geology and Mineral Technology conducted a resistivity survey in Safford, and conducted thermal gradient, geologic field work, and geochemical sampling statewide. The University of Arizona, University of Texas at El Paso, and New Mexico State University surveyed electrical resistivity and active and passive seismic studies in the San Bernardino Valley, Clifton, and Springerville-St. Johns. The New Mexico Bureau of Mines is doing thermal gradient and heat flow work statewide.

The Arizona Solar Energy Research Commission has signed a contract with Arizona State University for the performance of the Rocky Mountain Basin and Range Region State Geothermal Planning Project under funding received from New Mexico Energy Institute and the Four Corners Regional Commission.

A favorable feasibility study by EG&G Idaho examining the technical and economical aspects of developing an approximate 177°C geothermal resource for space cooling facilities at Williams Air Force Base has been completed.

The final version of the Arizona Geothermal Resource Map has been completed by the Arizona Bureau of Geology and Mineral Technology. The map is being forwarded to NOAA for publication.

Three geothermal facilities are in operation today: Hooker Hot Springs health spa, hot baths in Safford and Buckhorn Hot Springs, and the Arizona State University conference center at Castle Hot Springs. Whitewing Ranch, near Hyder, is studying the feasibility of space heating, cooling, and greenhouse adaptation. In Phoenix, an electronics firm is estimating the cost of space cooling, and in Tucson, IBM is considering space cooling of its plant.

Private sector programs embrace both exploration and commercialization. Since 1973, industries have drilled several test wells in Maricopa County, Pinal County, Kingman, and Bagdad.

Future state projects may include

- space heating or cooling at Chandler, Tucson, and Phoenix
- salt production and water desalinization at Yuma
- copper solution mining at Morenci
- integrated citrus processing, peak electrical power, and desalinization at Hyder
- upgrading of water quality, water heating and electrical power at Springerville-St. Johns, and Alpine
- electrical power at Clifton
- a 50 MW powerplant in Clifton
- a 700 MW plant in the San Bernardino Valley.

California

California serves as a model for other states where extensive geothermal resources offer the promise of commercialization. Both electric and direct use applications have been operating for some time now, and plans for more are actively being developed.

The California Energy Commission has completed a market survey for direct heat potential, and is sponsoring a geological mapping project in Susanville. The State Lands Commission is surveying all regulations affecting direct use. These two bodies together are completing a study of regulations for drilling low-temperature geothermal wells. In an attempt to speed commercialization, the California legislature streamlined the permitting process for exploratory drilling, and the Public Utility Commission required that geothermally produced electricity be wheeled through major utility transmission lines, even if the utilities are not customers.

Private sector development is taking place all over the state, almost all for electricity production. Phillips Petroleum is drilling temperature gradient holes at The Geysers, and is planning to drill at Mono Lake. Phillips is also doing extensive exploration studies near West Mesa and Chocolate Mountain and in San Bernardino county. Occidental Geothermal is drilling temperature gradient holes in the Glamis KGRA and at East Mesa, and is conducting a seismic survey and test drilling in Lake and Sonoma counties. Aminoil, USA has just completed its exploration of the Knoxville KGRA, and AMAX Exploration is working in the Mount St. Helens area. A magnetotelluric survey is being conducted in Surprise Valley by Geotronix, Inc.

More than 200 wells have been drilled at The Geysers, with generating capacity in excess of 663 MWe. An additional 320 MWe generating capacity is due on line at The Geysers in 1980; 1,200 MWe more are planned by 1987. A notice of intent has been approved for PG&E's Unit 16 at The Geysers. Specifically, Pacific Gas and Electric's (PG&E) Unit 13 (135 MWe) will come on line in 1980, and construction has been approved for Unit 17 (110 MWe).

In the Imperial Valley, 10 MWe is now coming on line, and an additional 425 MWe is expected by 1985. A total of 1,000 MWe is planned for 1990. The 10 MWe is a binary unit built by Magma Power and San Diego Gas and Electric at East Mesa. Southern California Edison and Union Oil are developing a 10 MWe single flash pilot plant at Brawley to expand to 100 MWe and are planning a 10 MWe powerplant at Salton Sea. With Chevron, SCE has a 50 MWe unit in the final design stage, due on line in 1982.

The Northern California Power Authority is awaiting final approval for construction of two 55 MWe plants in Sonoma County, and has filed a notice of intent for a 66 MWe unit in Lake County. The California Department of Water Resources is awaiting certification approval for a 55 MWe unit at Bottle Rock. The Sacramento Municipal Utility District and Aminoil are considering a 50 MWe unit in 1984 and a 55 MWe unit in the late 1980s. The city of Burbank is considering a hybrid geothermal/coal-fired powerplant in Rose Valley.

Direct Heat. At Honey Lake, greenhouses are being geothermally heated. The Latter Day Saints Church in Susanville is heated by geothermal energy; Calaquia, Inc. uses geothermal direct heat in fish farming and alfalfa field irrigation at Paso Robles.

The city of Middletown is considering the use of bleed steam from one of the wells at The Geysers* to heat the water, the swimming pool, and the greenhouse at Verdant Vales School.

The use of a 32°C developed spring is being considered for aquaculture at the Fort Bidwell Indian reservation. Basic Foods of Vacaville may relocate a food dehydration plant so that geothermal fluids can be used. An integrated livestock production system at Wendell-Amedee is in process by CLR Consortium and the University of Nevada.

Geoproduts, Inc. is conducting a geophysical study of an alfalfa pelletizing operation planned with Lassen College Foundation and Skakless Foundation at Wendell-Amedee. Susanville now heats its municipal swimming pool geothermally.

Hawaii

The University of Hawaii is studying three sites for exploration for high-temperature resources: Puna and Kailua-Kona on Hawaii, and Lahaina on Maui. The University of Hawaii Geophysics Institute is currently doing geothermal assessment on the island of Hawaii, and will expand its assessments to Maui and Oahu.

The private sector has undertaken exploration and made some tentative commitments. Geothermal Exploration and Development Company drilled exploratory holes at Puna, and announced plans to develop the entire 10,000 acre field there. If GEDC is successful, Kaiser Aluminum will build a plant that will use a 100 MW powerplant, leading to 300 MW capacity in the mid-1980s. Water Resources International, Inc. is drilling a step-cut well near Kailua-Kona.

Idaho

Site-specific development planning for the City of Boise's geothermal space heating project has guided city engineers in their procurement of hardware. Institutional, legal, and planning activities undertaken by the state of Idaho have convinced Idaho legislators to authorize municipalities to issue revenue bonds for geothermal district heating. Also, the Idaho Office of Energy and Governor Evans have introduced a bill to the Idaho House of Representatives to empower cities to issue revenue bonds for district heating with geothermal energy. A second bill declaring space heating a beneficial use passed the legislature.

A Raft River Geoscience Review was conducted April 16 and 17 in Pocatello, for representatives of the Federal and state governments, universities and national labs, and geoscience industries. Participants reviewed geoscience details and decisions since the inception of the Raft River Project and discussed technical exchanges and comments on future direction of Raft River programs.

Three agribusinesses in Idaho have shown interest in gasohol plants using geothermal energy.

*The well supplies steam for electric generation at the Geysers.

Nevada

Nevada already has several commercial direct heat applications. Forty wells have been developed in Reno for space conditioning and recreational use. Golconda, Caliente, and Steamboat are using geothermal space heating. Spas at Carson City and Steamboat are geothermal, and a firehouse at Gabbs is being geothermally heated. Wabuska Hot Springs has a commercial aquaculture facility. The Bureau of Mines and Geology is studying thermal waters. Preliminary designs and economic analyses are being carried out for retrofitting the Grover C. Dils Medical Center in Caliente, for district heating systems in Caliente, and for the Newlands Green Valley Estates in Fernley. A domestic hot water system for the Las Vegas Hilton Hotel is being designed and evaluated. The Reno Moana swimming pool is being considered for geothermal heating.

A well at Rye Patch achieved 171°C water at 1800 feet; the well is reported to be capable of driving a 7 MWe generator.

The developers of a prospective geothermal alcohol production plant in Crescent Valley are applying to the Four Corners Regional Commission for partial funding of the project.

A \$125,000 study is evaluating overall energy requirements, including alternative energy sources, of the MX missile system base facility in Nevada. A peak demand electrical requirement of 200 MW is likely to be supplied by a tie-in to an existing electrical bridge system, with an independent backup power system, which could be geothermal.

The state of Nevada has

- projected electrical development at Beowawe, Carson Sink, Deak Horse Wells, Cordero Mercury Mine, Darroughe's Hot Springs, Desert Peak, Dixie Hot Springs, Dyke Hot Springs, Fish Lake Valley, Hot Sulphur Springs, Humboldt Wells, Leach Hot Springs, McFairlane's, the Needles Rock, Rye Patch, San Emidio Desert, Soda Lake, Steamboat Springs, Wabuska Hot Springs, Sulphur Hot Springs, Warm Springs, and Brady Hot Springs.
- projected direct heat application at Steamboat Springs, Wabuska Hot Springs, Battle Mountain, Elko Hot Springs, Golconda, Sarcobatus Flat, Sodaville Springs, Brady Hot Springs and Caliente.

D. REGION X

Oregon

Oregonians have been reaping the benefits of geothermal energy use since the turn of the century. The Klamath Falls area of southern Oregon is a notable example, and has the most widespread use of direct geothermal application in the United States. The Oregon Institute of Technology campus in Klamath Falls represents one of the largest applications of geothermal space heating. Approximately 400 shallow-depth wells provide

heat to about 500 structures: residences, schools, businesses, industrial facilities, and swimming pools. Geothermal energy is now being consumed in Oregon at an average annual rate of approximately 16 MW, which is equivalent to 83,000 barrels of oil per year.

Both geothermal exploration and development are at an all-time high in Oregon. Five drill rigs are drilling temperature gradient wells in the Cascades and work is progressing on two DOE-funded demonstration projects. Oregon released a new map of thermal springs. A contract was signed and awarded on July 3 to the Oregon Department of Geology and Mineral Industries for geothermal assessment in the state of Oregon under the state co-op program.

Exploration, primarily temperature gradient holes, is taking place at the Mount Hood area, Lakeview, the Central Cascades, north Klamath County, Vale, Hot Lake, Malheur County, Lake County, Harney County, and LaGrande.

Existing Uses of Geothermal Energy. In Klamath Falls, geothermal resources are widely used for space heating and domestic hot water in private, public, and commercial buildings; milk pasteurization; pavement deicing; pool heating; agriculture facilities; accelerated curing of concrete; and greenhouse heating. In Lakeview, commercial greenhouses, residential space heating, pool heating, and worm farming all use geothermal energy. In Vale, greenhouses and residential space heating is accomplished by geothermal resources. Greenhouses, pools and hog-raising compounds in Cove are geothermal. Ontario, Hot Lake, and Haines all have geothermal space heating; the latter has greenhouses as well. Numerous spas and pools around the state are geothermally heated.

Oregon Trail Development in Vale is establishing a mushroom-growing facility that will use geothermal energy as a heat source. Hot Lake Resort near LaGrande is renovating and expanding an existing geothermal system for space heating.

Interest Expressed for Future Exploration and Development. In Nyssa, a food processor building a new facility is actively interested in using geothermal energy. Potato growers in Klamath Falls and La Grande, both of which have hot water resources, are pursuing alcohol production facilities using geothermal as a heat source. Timberline Lodge at Mt. Hood would like to use a geo-heating system in the existing lodge and in the planned day lodge. A commercial greenhouse operation is planning to relocate their facilities to the Klamath Hills area to use geothermal energy for heating. J.A. Albertson Ranch near Nyssa is conducting a feasibility study of using hot water for a feedlot operation and methane production. The cities of Oakridge, Lakeview, and Vale are interested in developing district heating systems and geothermal industrial parks. LaGrande and Eastern Oregon State College are interested in geothermal utilization for space heating.

Leasing. The primary areas of interest from an industry perspective, based on resource viability and available end use applications are the Cascade region from Mt. Hood south to the Belknap-Foley area and the Alvord Valley. Other areas of high interest include Newberry Crater and Vale.

It is important to note that, despite the level of current resource use, the potential for geothermal energy use in Oregon has barely been tapped.

Washington

Interest in geothermal energy in Washington began in the early 1970s and reached a high point in 1971 with the First Northwest Conference on Geothermal Power, in Olympia.

This initial surge was followed by considerable interest by industry; 238 lease applications for 492,000 acres were filed with BLM. Since then interest has waned, and many of the lease applications have been withdrawn. Only Amax Exploration, Inc., is known to have done exploratory heat-flow drilling in the state; Burlington Northern has maintained a low-profile program to assess the geothermal potential of company-owned properties in Washington. To date, no Federal geothermal leases have been issued in Washington.

The Division of Geology and Earth Resources has been assessing the geothermal potential of the state since 1972. As part of this assessment work, the Division has attempted to sample and do detailed geochemical analyses of all known thermal and mineral springs in the state. These geochemical data have been used to estimate reservoir temperatures for each spring system sampled.

In addition, the Division has supported or cooperated in (1) measuring thermal gradients and heat flows in mineral exploration drill holes and water well; (2) compiling existing geologic maps and conducting detailed reconnaissance geologic mapping in the southern Cascades; (3) assessing the use of ground noise measurements as a geothermal exploration tool; (4) publishing reports on the locations of earthquake hypocenters; (5) producing an aero-magnetic map of a large part of the southern Cascades; (6) publishing a gravity map of the state; and (7) sponsoring a project designed to measure gravity in the Indian Heaven areas. The Division intends to continue the geochemical assessment of the thermal and mineral springs in the state, while emphasizing those springs in the Cascades. The Division will also become increasingly involved in geological and geophysical assessment of Mount St. Helens, which is expected to continue for the next 3-5 years.

Of the known thermal and mineral springs in the state, 7 spring systems exhibit Na-K-Ca temperatures of over 100°C: Mount Baker Hot Springs, Sulphur Hot Springs, Kennedy Hot Springs, Garland Mineral Springs, Ohanapecosh Hot Springs, Gamma Hot Springs, and Summit Creek Mineral Springs (Soda Springs). None of these spring systems exhibits a significant flow; however, all have a definite spatial relationship to the strato-volcanoes.

The granting of Federal leases should serve as a catalyst in generating renewed interest in the geothermal potential of the state by industry. A renewed interest and commitment in the state by industry in conjunction with the accelerated assessment program conducted by the U.S.

Geological Survey and the Washington Division of Geology and Earth Resources is expected to result in the assessment and development of the state's geothermal resources, but remains dependent upon the adequate funding by the state and Federal agencies involved.

Alaska

The Alaskan state government has recently become involved in geothermal development. The State Division of Energy and Power Development has been working in conjunction with the Department of Fish and Game to utilize the geothermal resources on Bell Island for salmon hatcheries. The state legislature last year considered nearly \$1 million worth of appropriations for development of its geothermal energy resources by road building, drilling, and an agricultural experiment station at Pilgrim Hot Springs on the Seward Peninsula. The Legislature appropriated \$245,000 for a geothermal demonstration at Pilgrim.

It is obvious that Alaska has tremendous geothermal resources. The 104 hot spring locations and 88 volcanoes have the potential to provide a large amount of energy for the state. Local gradient and hot dry rock applications appear to have a future in Alaska as well. To date, no Federal or state geothermal leases have been issued in Alaska.

At Pilgrim Hot Springs, the State of Alaska plans to drill an exploratory well, if funding can be arranged to be used for an agricultural experiment station. If, in fact, the 180°C temperature is encountered, then a 4 MWe powerplant will be developed to come on-line in 1989. This would meet the expected electrical energy needs of the Nome area in that year.

In the case of Clear Creek Hot Springs, it has been calculated that the surface flow of that spring could produce 20-30 kw of binary electrical power, as well as space heat for up to 30 homes; it will take until 1989 to get this energy on-line.

Umnak Island has one of the best physical resources of those likely to be developed in the state. The presence of superheated water has raised a lot of speculation about the electrical potential of the KGRA there; 50 megawatts of electrical power will come on line in 1990 for metals processing.

Aquaculture/agriculture applications planned by the Aleutian Pribiloff Native Corporation will exceed 5×10^{10} Btu's annually by 1985. This will replace 380,000 gallons of fuel.

The new state capital in Willow will require 1.6×10^{12} Btu's for space heating by 1994, according to Capital Site Plans. Ninety percent of this amount, or 1.44×10^{12} Btu's, is targeted for on-line geothermal. This would be developed in increments from 1983-1994. Four separate events of somewhat equal magnitude are portrayed on the scenario.

The Klawasi geothermal project will put another 25 MW of electrical power on line by the year 2003. Other uses around the state, including those at Tegakee Springs, Baranof and Bell Island projects should add another 1×10^9 Btu's per year of geothermal utilization by the year 1987.

E. INDIAN TRIBES

Many tribes are interested in and some are pursuing the development of geothermal resource utilization as a contributor to the economies of their reservations. Many of the potential geothermal-resource-using tribes have a low economic base with high government subsidies. While most geothermal resource opportunities have not been fully explored, there is substantial reason to believe that tribes can develop their own local resources.

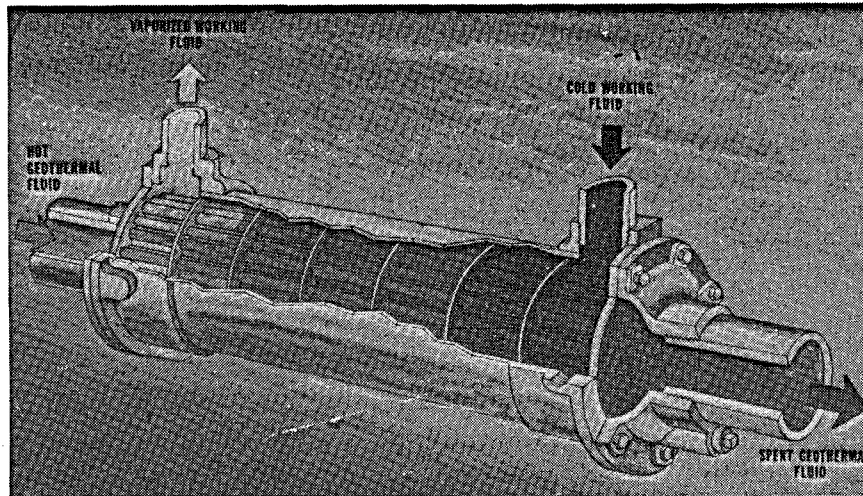
At Fort Hall Reservation, near Pocatello (Idaho), low to medium temperature well sites surround the reservation. The tribal council has passed resolutions to pursue geothermal development on the reservation. In one possible application, geothermal fluids could be used to distill alcohol from potatoes grown on the reservation. This alcohol will then be used to make gasohol that will be sold in the newly operating tribal gasoline station. The tribe is ready to start exploration.

The Fort Peck tribal research department has recently received a grant from DOE to begin resource exploration, identification of institutional barriers, and preliminary heating system design for a geothermal heating district system on the Reservation. If a decision is made to develop the resource, a new town with 250 Indian housing authority units may be located near the well sites.

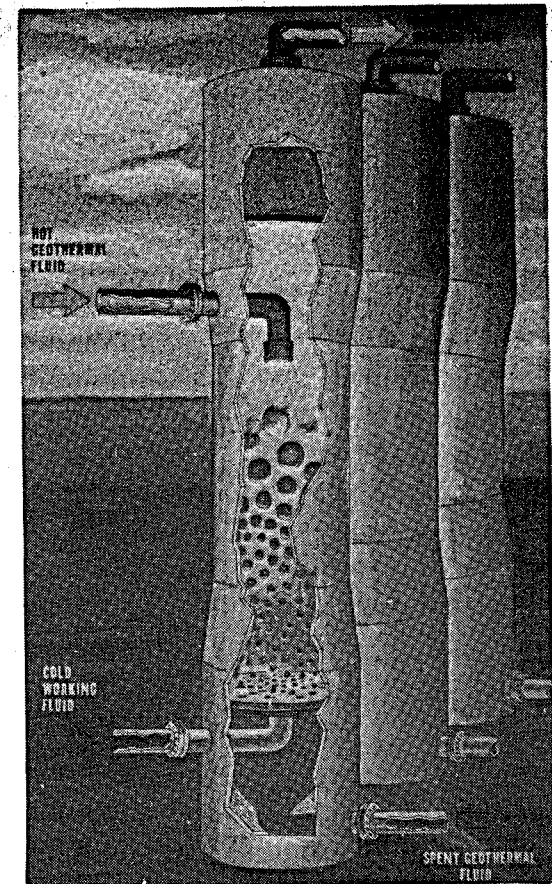
Moapa reservation is located in the southern portion of Nevada. The tribe has received development dollars from Economic Development Administration (EDA-DOC) of over \$500,000. Costs to continue the greenhouse operation require high amounts of energy dollars to heat the four acres of structures. A geothermal development project would cut overhead heating costs of the structures and make the project competitive.

The Baca Ranch is a joint venture of DOE, Union Oil and Public Service Company of New Mexico to build a 50 MWe geothermal power plant. The area is bounded on three sides by Indian pueblos and reservations. Tribes could provide labor during the construction phase, which would lower the high unemployment rate on the neighboring reservations.

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