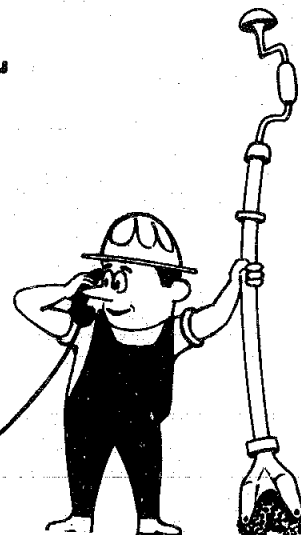
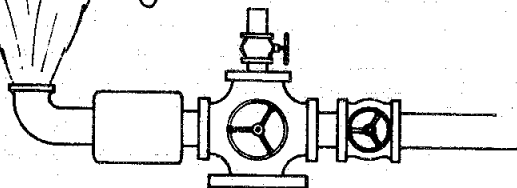
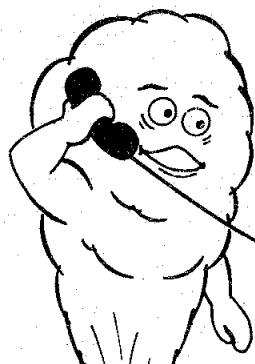


GEO THERMAL

Hot Line



A publication of the State of California - Division of Oil and Gas

Volume 4, Number 3

June, 1974

CALIFORNIA GEOTHERMAL SUIT

On May 1, 1974, Judge Ira A. Brown, of the Superior Court of the State of California, for the City and County of San Francisco, denied motions for judgment on the pleadings and for summary judgment in the case of *Pariani, et al. v. State of California, et al.*, S.F. Sup. Ct. No. 657-291. That lawsuit concerns the ownership of geothermal resources at The Geysers area in Northern California. The State claims the geothermal resources, through a reservation of "all oil, gas, oil shale, coal, phosphate, sodium, gold, silver, and all other mineral deposits contained in said lands" and by virtue of Public Resources Code Section 6407 which states that "mineral waters" are included within the State's reservation, while the surface owners (patentees of the State) claim the geothermal resources incident to their ownership of the land.

The surface owners moved for judgment on the pleadings and for summary judgment contending that the resources are "steam" or "hot water" or "the heat energy of the earth" and not reserved. Judge Brown was not convinced by the arguments of the surface owners that *United States v. Union Oil Co. of California* (see "Hot Line", v. 3, n. 6, November 1973), was persuasive authority for the proposition that geothermal resources on lands subject to such a reservation belong to the surface owners as a matter of law.

The Office of the Attorney General expects the case to proceed to trial.

NEW PRESIDENT FOR AAPG

John E. Kilkenny, Senior Geologist for Union Oil Company's Geothermal Division and Vice President of Philippine Geothermal, Inc., a wholly owned subsidiary of Union Oil Company, has been chosen as president-elect of the American Association of Petroleum Geologists. Mr. Kilkenny will assume the presidency on July 1, 1975. A native Californian, Kilkenny held positions as a geologist and executive with the Texas Company, The Superior Oil Company, Pure Oil Company, and Chanslor-Canfield Midway Oil Company prior to joining Union.

Munger Oilgram

THE OREGON PROBLEM

In recent meetings between representatives of Oregon's Governor, Tom McCall, the State Geologist, R. E. (Andy) Corcoran, and the State Engineer, Chris Wheeler, it was recognized that under current Oregon law, dual responsibility exists in the drilling of exploratory geothermal wells.

The prime responsibility for regulation of geothermal wells is delegated to the Department of Geology and Mineral Industries, which regulates all operations. They issue drilling permits, approve casing programs, inspect and test blowout-prevention equipment, and witness and approve abandonment or completion procedures.

However, because of the State Engineer's interpretation of Oregon water law, which in effect states that all wells drilled for the purpose of extracting water must be drilled by an Oregon-licensed water well driller, a licensed water well driller must be present to supervise all drilling activities at all geothermal wells.

This position, because of the extreme inconvenience and costs it generates, has caused at least one geothermal operator to scratch Oregon from his list of exploration prospects until such time that the position is reversed.

KLAMATH FALLS, OREGON CONFERENCE

The State of Oregon and the Klamath Falls Chamber of Commerce have jointly scheduled a conference for October 7-9 on the non-electrical uses of geothermal energy at the Oregon Institute of Technology in Klamath Falls. The conference will cover various subjects, including the industrial, agricultural and commercial-residential uses of geothermal energy, and will feature speakers from several countries in which low-temperature geothermal energy utilization systems have been developed. In addition, a field trip to several geothermal operations in the Klamath Falls area has been scheduled for the afternoon of October 8.

Information on the conference, exhibits, and registration forms can be obtained by writing Geothermal Conference, P.O. Box 1901, Klamath Falls, Oregon 97601.

U.S. GEOLOGICAL SURVEY OPEN FILE REPORTS

Following is a list of the latest U.S.G.S. open file reports pertaining to geothermal exploration:

1. The chemical composition and estimated minimum thermal reservoir temperatures of the principal hot springs of northern and central Nevada, by R. H. Mariner, J. B. Rapp, L. M. Willey, and T. S. Presser. 32 p., 1 fig. 345 Middlefield Road, Menlo Park, California 94025; Room 229 Federal Building, 705 North Plaza Street, Carson City, Nevada 89701; and 504 Custom House, 555 Battery Street, San Francisco, California 94111.
2. Basic heat-flow data for the United States, compiled by J. H. Sass and R. J. Munroe. 456 p., 1 fig. 504 Custom House, San Francisco, California 94111; 7638 Federal Building, Los Angeles, California 90012.
3. Preliminary geologic map and cross-sections of Casa Diablo geothermal area, Long Valley caldera, Mono County, California, by Roy A. Bailey. Map, cross-sections (2 sheets), scale 1:20,000. 504 Custom House, San Francisco, California 94111; 7638 Federal Building, Los Angeles, California 90012; California Division of Mines and Geology, 118 Resources Building, 1416 - 9th Street, Sacramento, California 95814; Ferry Building, San Francisco, California 94111; and State Office Building, 107 So. Broadway, Los Angeles, California 90012. (Material from which copy can be made at private expense is available in the Menlo Park, San Francisco, and Los Angeles offices of the U.S. Geological Survey.)
4. Geologic map of the eastern San Francisco volcanic field, Arizona, by Richard B. Moore and Edward W. Wolfe. 2 sheets, scale 1:50,000. USGS Library, 601 East Cedar Avenue, Flagstaff, Arizona 86001.
5. Preliminary potassium-argon age data on volcanic rocks of Long Valley caldera and vicinity, Mono County, California, by G. B. Dalrymple and M. A. Lanphere. 3 sheets (scale 1:65,000), 1 p. tabular material. 504 Custom House, San Francisco, California 94111; 7638 Federal Building, Los Angeles, California 90012; California Division of Mines and Geology, Resources Building, 1416 - 9th Street, Sacramento, California 95814. (Material from which copy can be made at private expense is available in all depositories.)

UNIVERSITY OF CALIFORNIA, RIVERSIDE

Following is a question submitted by Dr. Michael Reagan of the University of California, Riverside. The information received is to be used in a study being made by the Center for Social and Behavioral Sciences.

"What kinds of sanctions might be written into regulatory legislation dealing with geothermal development, to maximize voluntary compliance on the part of geothermal businessmen? Some leads toward identification of crucial factors are contained in a theoretical paper by a political scientist at the University of California, Riverside. Those interested are invited to write for a free copy of the paper, "Compliance with Law," by Dr. Don W. Brown. Requests should be addressed to: Center for Social and

Behavioral Science Research, University of California, Riverside, CA 92502. (Or call 714-787-3596) Copies of the paper will be available about 1 May."

U. S. ATOMIC ENERGY COMMISSION CONFERENCE

The U. S. Atomic Energy Commission and the University of California, Lawrence Berkeley Laboratory, have scheduled an all-day conference to discuss the Commission's role in Geothermal Power Development on June 18, 1974, in the Physical Sciences Lecture Hall, University of California, Berkeley campus beginning at 8:30 a.m.

The purpose of the conference is to explore the possibilities of cooperative projects between the A.E.C. and other organizations to assist in establishing the technical, economic, and practical feasibility of power production from various types of geothermal resources.

Conference Agenda

Opening Remarks	University of California Lawrence Berkeley Laboratory
Overview of A.E.C. Geothermal Energy Research Program	Division of Applied Technology, USAEC, Washington, D. C.
Project Presentations	Aerojet Nuclear Company Lawrence Livermore Laboratory Los Alamos Scientific Laboratory Battelle-Pacific Northwest Laboratory Division of Physical Research USAEC, Washington, D. C. Lawrence Berkeley Laboratory
Open Discussion	
Summary and Future Plans	Division of Applied Technology

In order to participate in this conference, interested individuals and organizations should write or contact Mr. Robert West, University of California, Lawrence Berkeley Laboratory, Building 90, Berkeley, California 94720, telephone (415) 843-2740, extension 5020. Please respond by June 11, 1974.

CORROSION TEST UNITS SALTON SEA FIELD

The U. S. Bureau of Mines has designed and constructed two small experimental units for corrosion testing at the Salton Sea field. One unit is a small steam turbine with blades of four test alloys to be mounted in the flow line of separated steam. The other unit is a flow through system of the same four alloys to be placed in the separated brine stream. San Diego Gas and Electric Company is now operating these test units with their own experimental equipment on the "Magmamax" 1 well, Sec. 33, T. 11 S., R. 13 E., S.B.B. & M.

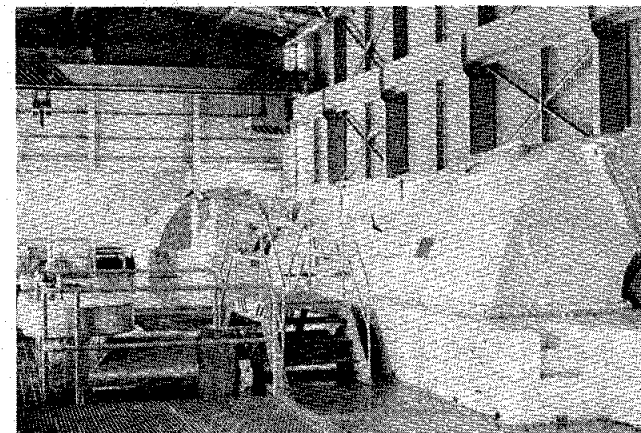
This is the first field test of the U. S. Bureau of Mines corrosion study. Previous studies have been conducted in the laboratories at College Park, Maryland, and at Albany, Oregon. A field laboratory facility is being planned for the Salton Sea field where the most concentrated geothermal brine is found.

CERRO PRIETO MEXICO

Turbine Inspection

Unit 2 of the Cerro Prieto geothermal power plant in Baja California, Mexico, has been dismantled for its first inspection. The power plant was dedicated in April 1973

(see "Hot Line", v. 3, n. 2, April 1973), and this Toshiba turbine which has a capacity of 37.5 MW, has been operating continuously since then. Unit 1, which went on the line in the latter part of 1973, will continue to supply electricity to the Mexicali area during the inspection of Unit 2.



Turbines and generators in the Cerro Prieto power plant.

FEDERAL GEOTHERMAL LEASE SALE

Sacramento, California

On May 29, 1974, the Bureau of Land Management held their second geothermal lease sale in California. The sale was restricted to two leasing units at The Geysers that were previously offered in January 1974. Bids were made for both of the units (7 and 9) at the first sale; however, they were rejected by the B.L.M. as being below presale evaluations made by the U. S. Geological Survey. The new bids were higher than those received in January and they are now being evaluated (see "Hot Line", v. 4, n. 1, February 1974). Following is a tabulation of the bidding, by unit, showing the highest bid and runner-ups:

Unit 7	
Natomas Company	\$2,055,000.00
City of Santa Clara	2,000,002.00
Signal Oil and Gas Company	1,087,777.00
Union Oil Company of California	345,016.56
Unit 9	
Union Oil Company of California	220,342.40
Occidental Petroleum Corporation	220,000.00
Signal Oil and Gas Company	192,650.00

Editor's Note The City of Santa Clara, with a bid of over \$2 million, is believed to be the first member of the Northern California Power Agency (which includes 11 cities) that has put up hard cash for geothermal energy.

CALIFORNIA STATE LANDS ACTION

The California State Lands Commission, at its regular monthly meeting on June 27 in Sacramento, will hold public hearings regarding submerged lands in Surprise Valley, Modoc County.

The first action by the Commission will be to consider two applications for prospecting permits from Getty Oil Company of Bakersfield, covering 22km² (5,427 acres) of lake-bottom at the south end of Upper Alkali Lake and 18km² (4,430 acres) at the north end of Middle Alkali Lake.

Also to be considered by the Commission this month is a prospecting permit application from American Thermal Resources, also of Bakersfield, for 15.5km² (3,836 acres) of submerged land on the southwest side of Lower Alkali Lake.

UNIT POOLED AREA THE GEYSERS

The California State Lands Commission recently gave a conditional go-ahead to Union Oil Company for a pooling agreement to increase geothermal exploration in the Cobb Mountain area of Lake and Sonoma Counties adjacent to The Geysers geothermal field.

Union plans to form a Unit Pooled Area of approximately 2,000 acres by combining portions of its State-owned mineral leases with private surface and mineral leases in the area for geothermal drilling purposes. Production from any well drilled in the area will be proportionately allocated to the leaseholders. The State's leasehold covers 23 percent of the unit area; the remainder of the unit is under private ownership.

The pooling agreement was approved by the State Lands Commission with the proviso that it will not become final until Union is granted a drilling permit by the Lake County Board of Supervisors. Under the final agreement, it will be required that Union continue to drill new wells at six-month intervals.

A State Lands Division spokesman was quoted as saying, "Formation of the proposed unit would provide the state with interests in a much larger area and increase the chances of State participation in new geothermal discoveries. Commercial production from the area would provide additional energy capacity for public use and increase geothermal income to the State. Unit development, such as is being proposed, would provide a more timely and orderly development of state and private lands to promote conservation of geothermal resources while minimizing impact on the environment."

GEOTHERMAL MERGER

Champion Silver Mining Co. of Denver, Colorado, and Geothermal Power Corp. of Scottsdale, Arizona, announced last month that an agreement has been reached, subject to the approval of the Champion board of directors, pursuant to which Champion will acquire all of the assets of GPC in exchange for 2,200,000 shares of Champion's common stock.

GPC holds geothermal leases on approximately 28,000 acres of land in Idaho and Oregon. Champion, with mica and feldspar mining operations in South Dakota, is a publicly held company.

As part of the overall transaction, five of the present directors of GPC will be elected to the seven-man Champion board of directors and the current officers of GPC will become the operating officers of Champion.

It has further been agreed that Champion may use the name Geothermal Power Corp., and it has been predicted that the formal change of Champion's name to Geothermal Power Corp. will be approved at the next shareholder's meeting in the fall. GPC will ask its stockholders to approve a liquidation of the corporation under which they would surrender their GPC stock in exchange for the Champion stock being issued to GPC.

CANADIAN LAND INVESTMENTS

Canada Geothermal Oil Ltd., acting on its own and on the behalf of its partners through its wholly owned subsidiary, California Geothermal Inc., recently completed filing on approximately 450,000 acres of Federal geothermal permit lands in California, Idaho, Oregon, Nevada, and Washington. These filings were under the first simultaneous bidding on Federal geothermal rights permitted by the U. S. Government.

Partners in the company are Albany Oil and Gas Ltd., Canada Northwest Land Ltd., Francana Oil and Gas Ltd., Siebens Oil and Gas Ltd., and Trans-Canada Resources Ltd.

SANTA FE, NEW MEXICO

Public Hearing on Geothermal Rules

The New Mexico Oil Conservation Commission held a public hearing on their proposed state rules for development of geothermal resources on June 11, 1974.

State Geothermal Lease Sale

The State of New Mexico (through the Commissioner of Public Lands) will hold its first geothermal lease sale on August 14, 1974.

A set of the proposed state rules for the development of geothermal resources and a list of the land to be leased can be obtained from:

Jack J. Kennedy
Director Mineral Division
New Mexico Public Lands
P.O. Box 1148
Santa Fe, New Mexico
(505) 827-2533

OR

Dan Nutter or Carl Ulvog
State of New Mexico
Oil Conservation Commission
P.O. Box 2088
Santa Fe, New Mexico 87501

The sale will be held in Morgan Hall in the State Lands Office Building in Santa Fe.

UPCOMING GEOTHERMAL LEASE SALE

Vale Hot Springs K. G. R. A., Oregon (final filing date June 27, 1974)

(T. 18 S., R. 45 E., W.M.B.&M.)

Leasing Unit No. 1

Sec. 18, W¹/₂ SE¹/₄

Sec. 27, Lots 3, 5, 6, 7, 8, 9, 10, 11, 12, S¹/₂ NE¹/₄

Sec. 28, Lot 8, W¹/₂ NW¹/₄

Sec. 32, SE¹/₄

Sec. 33, Lots 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, N¹/₂ SW¹/₄, SW¹/₄ SW¹/₄

Total 1,347.17 acres

For information contact:

U. S. Bureau of Land Management
P.O. Box 2965 (729 N. E. Oregon Street)
Portland, Oregon 97208

ELEVEN CITIES GEOTHERMAL HOPES

Pacific Gas and Electric Company of San Francisco has initiated negotiations that could provide eleven northern and central California cities with electricity generated at The Geysers geothermal field. PG&E opened bargaining in a proposal submitted to the Northern California Power Agency in early May.

The eleven members of the NCPA are Alameda, Biggs, Gridley, Healdsburg, Lodi, Lompoc, Palo Alto, Redding, Roseville, Santa Clara, and Ukiah. Each of these cities owns its power distribution system.

Under the proposal, PG&E offered to transmit power on its own powerlines from a generating plant at The Geysers as a supplemental source of electricity. However, the NCPA had hoped to build its own 220 Mw power plant there.

NCPA has been sparring with PG&E and various geothermal landowners for years, claiming that they have stopped NCPA from gaining access to The Geysers field. Both PG&E and Union Oil Company, which supplies steam to PG&E, have denied the charges.

NCPA expects to present a counter-proposal to PG&E within a few weeks.

SACRAMENTO UTILITY FEASIBILITY STUDY

A study is now underway by the Sacramento Municipal Utility District in Sacramento, California's capitol, to determine the feasibility of developing supplementary geothermal power at The Geysers field.

SMUD's interest in geothermal power parallels that of the Northern California Power Agency (see above article) in that they are studying the economics of developing 200 to 300 mw with their own power plants at The Geysers. SMUD has contacted all major leaseholders in the area for information on which to base this study. Preliminary results indicate that the cost would be about \$25,000,000 per 100

Mw. Included in this estimate are 100 miles of power transmission lines; however, use would be made of existing power nets where possible. At present electricity generated by SMUD is integrated into the transmission networks of the U. S. Bureau of Reclamation and Pacific Gas and Electric Company.

TIWI POWER PLANT PHILIPPINES

The Tiwi 100 MW geothermal power plant will be the largest geothermal power plant of its kind in the Far East and incorporates the use of hot water from the reservoir areas with a double-flash system such that there is a dual steam inlet in the turbine at two different pressures and temperatures. By using this double-flash system it is possible to substantially reduce the hot water required over that which is required by a single flash system.

Rogers Engineering Co., Inc., San Francisco has prepared for the National Power Corporation, Manila the preliminary design and the major equipment specifications and is now waiting for bid proposals on the major equipment. Rogers is proceeding with a definitive design of the power plant indicating the general arrangement of the equipment and the relationship of the power plant building and cooling towers. See also Well Operations, Luzon, Philippines, in this issue.

WELL OPERATIONS

LUZON, PHILIPPINES

Philippine Geothermal, Inc. (Union Oil Company)

Philippine Geothermal has completed five successful geothermal wells, "Naglagbong" 1 through 5, in the Tiwi area of southern Luzon's Bicol Peninsula, about 320 km southeast of Manila (see "Hot Line", v. 3, n. 5).

A PGI spokesman reports that, after a power plant and transmission lines have been constructed and production wells drilled, the Tiwi field, a hot water system, will supply electricity for new suburbs east of Manila.

BOX ELDER COUNTY, UTAH

Geothermal Kinetics, Inc.

Geothermal Kinetics has cemented 17.8 cm casing from 2658.6m to 3166.1 m in their well, "Steam Venture-Davis" 1, near Crystal Hot Springs (see "Hot Line", v. 4, n. 1 and 2). On June 6, they were drilling cement out of the shoe of the casing in preparation for drilling ahead to an undisclosed proposed total depth.

GILA COUNTY, ARIZONA

Nix Drilling Company

Nix Drilling Company spudded their well, "State" 1, on April 23, 1974 (see "Hot Line", v. 4, n. 2). Drilling has progressed slowly, mainly because only two men -- working daylight hours -- are drilling the hole, and to date 31.1 cm casing has been cemented at 23.2 m and a 24.8 cm hole has been drilled to 110 m. At the end of May, one of the crew members was stricken with a skin infection caused by alkali poisoning and the rig has been idle since then.

"State" 1 is located in an area of hot springs, the nearest of which is about 366 m north of the rig and has a temperature of 93°C. The elevation of the well is 856 m.

PINAL COUNTY, ARIZONA

Geothermal Kinetics, Inc.

Geothermal Kinetics is moving in equipment to drill a wildcat geothermal well, "Geothermal Kinetics-AMAX Exploration-Pima Farms" 1, which is located 201 m south and 605 m east from the SW corner of Sec. 8, T. 7 S., R. 8 E., G.&S.R.B.&M. The rig is being moved from one of Geothermal Kinetics' Higley wells (see "Hot Line", v. 4, n. 1), about 60 km south to the new location.

Geothermal Kinetics will be operator and GeoDrilling, Inc. contractor for this 2,300 m exploratory well, which will be the first of a series of wells to be drilled jointly with AMAX.

The new well's location was spotted using strictly geophysical methods; it has been reported that there are no surface geothermal manifestations in the area.

IMPERIAL COUNTY, CALIFORNIA

U. S. Bureau of Reclamation

The U.S.B.R. intends drilling three more test wells in conjunction with their East Mesa project in Imperial County. The wells, which will be drilled this summer by Big Chief Drilling Co. of Oklahoma, are scheduled for a depth

of about 1,830 m. Their numbers, locations and intended use follows:

NEW WELLS

Number	Location	Use
"Mesa" 5-1	NE ¹ / ₄ NE ¹ / ₄ Sec. 5, T. 16 S., R. 17 E., S.B.B.&M.	Injector
"Mesa" 8-1	NW ¹ / ₄ NW ¹ / ₄ Sec. 8, T. 16 S., R. 17 E., S.B.B.&M.	Producer
"Mesa" 31-1	NW ¹ / ₄ NW ¹ / ₄ Sec. 31, T. 15 S., R. 17 E., S.B.B.&M.	Producer

EXISTING WELLS

"Mesa" 6-1	NW ¹ / ₄ SE ¹ / ₄ Sec. 6, T. 16 S., R. 17 E., S.B.B.&M.	Producer
"Mesa" 6-2	NE ¹ / ₄ SW ¹ / ₄ Sec. 6, T. 16 S., R. 17 E., S.B.B.&M.	Producer

The proposed locations of the wells were based on temperature measurements made in 24 shallow holes, 300 to 955 feet in depth. In addition, a 1,000-foot hole was drilled jointly with the U.S. Geological Survey, on the west flank of the Mesa anomaly, to monitor artesian pressures during production of the new wells. A tiltmeter installation also is being constructed to determine if subsidence is taking place.

Two existing desalination units, just northwest of "Mesa" 6-1, are being intermittently operated; however, upon the completion of a new injection well and two new producing wells, these units can be placed on long-term runs. Both units are equipped with corrosion test equipment (the water quality of the two new producing wells is expected to be about 2,500 parts per million).

Chevron Oil Company

Chevron Oil Company, working jointly with Magma Power Company and San Diego Gas and Electric Company, has nearly completed its production testing program in the Heber G.R.A. of Imperial County. Chevron reports that corrosion and scale build-up tests to date are encouraging and that the geothermal reservoir characteristics are very promising.

The wells, "Nowlin Partnership" 1 and "Holtz" 1, have undergone extensive production testing, and the waste fluids have been reinjected into "Holtz" 2 (see "Hot Line", v. 4, n. 1).

As soon as a drilling rig is available, Chevron intends drilling a step-out well to test the size of the reservoir. One of the three wells mentioned in the "Hot Line" (v. 4, n. 2) will be drilled for this purpose.

Salton Sea Geothermal Field Magma Power Company

Magma Power Company, in joint venture with San Diego Gas and Electric Company, predicts that they will have completed their temperature, pressure, fallout, flow rate, corrosion, and steam quality testing program in the Niland area by the end of June (see "Hot Line", v. 2, n. 6 and 7).

No specific data has been released as yet, but it is reported that the partners are elated over all test data analyses to date.

MENDOCINO COUNTY, CALIFORNIA

Sun Oil Company

Sun Oil Company, because of landowner difficulties, has scratched plans to drill their proposed wildcat geothermal well, "Annette Fedeli" 1, in Sec. 23, T. 12 N., R. 10 W., M.D.B.&M. Their Notice to Drill, submitted to the California Division of Oil and Gas, has been cancelled (see "Hot Line", v. 4, n. 1).

Instead, they will file notices for two new wells to be drilled in the same general area of southeastern Mendocino

County, near the northwest end of The Geysers geothermal field. "Macii-State" 1 will be located 948 m north and 1,135 m west from the SE corner of Sec. 13, T. 12 N., R. 10 W., M.D.B.&M., and "Torchio-Ferro" 2 will be located about 1.5 km south of that at 550 m north and 1,183 m west from the SE corner of Sec. 24.

An Environmental Impact Report covering both wells was submitted to the Mendocino County Planning Commission on June 7. Sun would like to begin drilling if a rig is available, in late July; but, if recent events in other counties adjacent to The Geysers are any indication, approval of the EIR and letting of the drilling permits will be slow in coming. For many months environmentalists have been severely delaying development at, and around, The Geysers.

MODOC COUNTY, CALIFORNIA

American Thermal Resources

American Thermal Resources intends spudding the first of three proposed 2,130 m geothermal test holes in Surprise Valley by early fall this year. So far, only one of the proposed wells has been approved by the Modoc County Planning Commission, but no difficulty is foreseen in obtaining permits for the other two wells. This first well will be located in the NE corner of Sec. 1, T. 40 N., R. 16 E., MD.B.&M., a little to the northwest of the south end of Middle Alkali Lake. Although the holes -- one or two of which may be jointly drilled with Gulf Oil Company -- are scheduled for about 2,130 m total depths, a drilling rig with a deeper capability will be used to drill them.

Magma Energy, Inc.

Magma intends deepening their Surprise Valley well, "Phipps" 2, later this summer, as soon as a drilling rig becomes available for use. Present plans are to deepen the well another 300 m or until a sufficiently high temperature is obtained.

"Phipps" 2, located in the NE^{1/4} NE^{1/4} of Sec. 23, T. 44 N., R. 15 E., M.D.B.&M., was spudded on November 13, 1972 and drilled through volcanics to a total depth of 1,376 m on December 24, 1972. The static bottom-hole temperature in this well was above 150° C.

LEWIS AND CLARK COUNTY, MONTANA

Marysville Geothermal Project

Battelle-Northwest of Richmond, Washington, and Southern Methodist University of Texas, co-principals in a National Science Foundation grant--the Marysville Project--have announced that the scheduled 2,000 m project test well will be spudded about June 10, 1974. Rogers Engineering of San Francisco, a consultant to the grant, has the responsibility for the management of the drilling program. In this capacity, Rogers field surveyed the drill site, prepared site plans, prepared drilling specifications, and selected a contractor by competitive bidding. Molen Drilling Company of Billings, Montana, has been selected as the driller. It is planned that the drilling of the lower portion of the hole will be done with a mist or foam using compressed air as the drilling medium.

In addition to the management of drilling operations, Rogers Engineering, at the conclusion of drilling, will prepare feasibility reports on methods for heat extraction and utilization of the geothermal energy.

The area around Marysville was brought to geothermal prominence by D. D. Blackwell of Southern Methodist University. During the course of a regional heat-flow study,

Blackwell noted unusually high values in holes drilled for gold exploration. He reported heat flow values up to 19.5 $\mu\text{cal}/\text{cm}^2/\text{sec}$, and postulated a cooling magma chamber within 1.5 km of the surface might be the source of heat.

LANDER COUNTY, NEVADA

Chevron Oil Company

At Beowawe, in the Whirlwind Valley of Nevada, Chevron Oil Company, operator in a joint venture with American Thermal Resources, is drilling a sidetrack hole below 2,600 m in their well "Chevron-ATR-Ginn" 1-13. This well (see "Hot Line", v. 4, n. 1 and 2) was spudded last January 25, 34 cm casing was cemented at 247 m, and the original hole was drilled to a total depth of 2,630 m. At this point a drilling mishap caused the drillstring to be lost in the hole, a portion of which subsequently was salvaged. As a consequence 46 drilling days were lost to fishing operations, and 12 days were lost to plugging and sidetracking attempts. Eventually, the hole was plugged back to about 2,530 m, and the new hole was kicked off from that depth. The proposed total depth is 3,050 m.

SANDOVAL COUNTY, NEW MEXICO

Union Oil Company

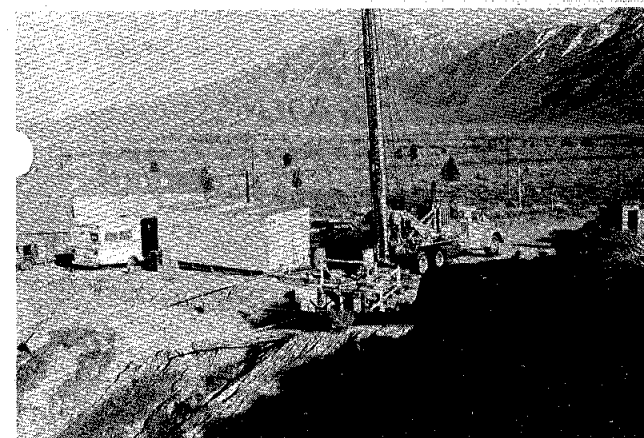
Union Oil Company intends to drill a step-out well, on trend, near their "Baca" 11 in Sec. 12, T. 19., R. 3 W., N.M.B.&M. in the Valles Caldera (see "Hot Line", v. 4, n. 1). They are prepared to begin drilling operations in time, but because of the scarcity of drilling rigs, drill pipe, and casing that the entire industry is experiencing, they may be forced to wait until late fall before a rig becomes available. This could cause a postponement of drilling until late next spring because the elevation in the area is about 2,700 meters and snow flies early there.

MONO COUNTY, CALIFORNIA

Casa Diablo Geothermal Field Magma Energy, Inc.

Magma Energy, Inc. has begun pump and injection tests in two of their wells in the Casa Diablo field, 5 km east of Mammoth Lakes. A Peerless pump has been installed in well "Endogenous" 1, Sec. 32, T. 3S., R. 28 E., M.D.B. & M., to test the pumping characteristics of the reservoir. The produced water is piped directly to "Endogenous" 2, about 125 m northwest of "Endogenous" 1 in the same section, where it is reinjected. The above tests are in preparation for the installation by Magma of a 10,000 to 15,000 kw binary cycle power plant. Southern California Edison Company is named as the purchaser of the power (see "Hot Line", v. 4, n. 2, April 1974).

All of the wells in the Casa Diablo field were drilled in the late 1950's and early 1960's and have been idle since that time. Reservoir temperatures are high enough (c. 162°C) for the operation of a binary cycle system. Because of the high arsenic content, all water produced will be reinjected.



Rig and test facility at Magma Energy well "Endogenous" 1, Mono County, California.

CHURCHILL COUNTY, NEVADA

Phillips Petroleum Company

Phillips, because of upcoming competitive bidding on Federal lands in the area of their well, "Desert Peak" 29-1, at Carson Sink (see "Hot Line", v. 4, n. 2), is tight-holing all drill data from the well. However, it is known that the well was spudded on April 1, a hole was drilled, and the rig was released on May 17, 1974.

Union Oil Company-Magma Energy, Inc.

On April 19, 1974, Union-Magma spudded their well, "Union-Magma-S.P. Brady" 1 (see "Hot Line", v. 4, n. 2) near Brady Hot Springs. Because of very hard rock, drilling is difficult throughout the entire operation, causing numerous setbacks. However, during drilling operations, the following casing strings were cemented in the hole -- 50.8 cm at 35.7 m, 34 cm at 318.2 m, and 22 cm at 1219.1 m. Following that, the hole was drilled to a total depth of 2217.3 m.

Subsequently, it was discovered that there were holes in the 22 cm casing at a fairly shallow depth, and it appears likely that they will be forced to run and cement a smaller string of casing (probably 14 cm) from the surface to total depth.

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