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

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"The Earth has a spirit of growth."

--Leonardo da Vinci

CALIFORNIA ENERGY REPORT AVAILABLE

The Division of Oil and Gas has released a report on "Energy in California -- Its Supply, Demand, Problems." This report briefly covers all aspects of energy utilization in California and projects the changing picture through 1985. Stressed in the report is the decline in oil and gas production and the need to import ever increasing amounts of fuel. Copies are available for $2.00 each from the Division's Sacramento office.

NEW U.S.G.S. OPEN-FILE REPORT

The U. S. Geological Survey has open-filed a report on Preliminary Results of Geoelectrical Investigations near Clear Lake, California. The authors, W. D. Stanley, D. B. Jackson, and B. C. Hearn, have studied the area between The Geysers and Clear Lake, a square approximately 15 miles on a side. Their work consists of total-field dipole mapping using five source dipole locations and seven Schlumberger array vertical electrical soundings.

A copy of the report can be obtained from the Division of Oil and Gas for $2.00. Included with the report are seven large maps showing composite apparent resistivity and resistivity for each source location.

NAPA VALLEY PICNIC

There will be a no host, non-structured, no reservation picnic open to everyone involved in the field of geothermics at the Bothe-Napa Valley State Park on Sunday, April 29, 1973. The park is in the Napa Valley, midway between St. Helena and Calistoga, on State Highway 29. The picnic will begin about 10 a.m. Bring the family, a large lunch, a frisbee, and plan to spend the day.

OTTER TAIL DECISION

On February 22, 1973, the United States Supreme Court issued a decision concerning an appeal filed by the Otter Tail Power Co., a privately owned utility headquartered in Fergus Falls, Minnesota. The 4-3 decision upheld a previous decision against Otter Tail for violation of the Sherman Antitrust Act. Otter Tail had refused to "wheel" power over its transmission net for local municipal systems contending that as more and more municipalities turned to public power, Otter Tail's position as a supplier of power would be eroded.

The decision has great importance in the future development of The Geysers geothermal field. The Northern California Power Association (N.C.P.A.) presently buys power from the Bureau of Reclamation Central Valley Project. This power is being "wheeled" over the Pacific Gas and Electric Company's grid to the 11 different cities which make up the N.C.P.A. The growth of the 11 cities has caused their power demands to exceed allotted lower-priced power available from the Central Valley Project. Facing higher power costs from P.G.&E., the N.C.P.A. has considered the construction and operation of a power plant at The Geysers to augment its supply. The power would be far too costly for the N.C.P.A. The decision definitely paves the way for the N.C.P.A. to develop their own source of power at The Geysers geothermal field.

PRESIDENT NIXON'S PROPOSED BUDGET

The budget requested for fiscal year 1974 will require cutbacks in many departments. Certain budget changes may have a direct effect on the geothermal community. The Department of the Interior request includes a new program for Energy Planning and Development to be funded at $25 million. This program, under the Office of the Secretary, will support research and development efforts for the use of non-nuclear energy and will emphasize solutions to short-range energy problems.

In the United States Geological Survey, the budget for Geothermal Investigations will remain at $2.5 million. Because of rising costs, this same funding will result in less work being done.

The Bureau of Reclamation budget has been cut $150.8 million to a level of $339.9 million. It is not yet known what effect this will have on the Bureau's geothermal program in the Imperial Valley.

The Office of Saline Water Research has taken a drastic cut of $24.4 million to a level of $2.5 million. The geothermal program has been eliminated, and the remaining funds are for the phase-out of O.S. W. operations.

Budget requests for the National Science Foundation were increased $26.5 million to $641.5 million. Part of this increase will go to Research Applied to National Needs; up $9.2 million to a level of $79.2 million.

PHILIPPINE ISLANDS

President Marcos has announced an offer by the New Zealand government to provide financial and technical assistance to study the numerous geothermal areas in the Philippine Islands. The project is designed to determine the potential for power production to electrify rural areas. Arturo Alcaraz of the Commission on Volcanology has said that at least seven of more than 73 hot spring areas have geothermal economic potential. The Philippine government would like to start drilling operations as soon as the negotiations with New Zealand are completed, hopefully by April of 1973.

DUNES AREA - DEEP RESISTIVITY - HARDING-LAWSON ASSOCIATES

Harding-Lawson geophysicists conducted a deep (dipole-dipole) resistivity survey across the "Dunes" geothermal anomaly in Imperial Valley as part of an in-house testing and demonstration program in geothermal exploration. Extremely good results define the low resistivity associated with the high temperature anomaly. The area was explored using 8 KW-20 amp electrical resistivity equipment, 500 ft. dipole lengths and electrical electrode separation of n=5. Resistivity contrasts from cold areas to hot areas are on the order of 2:1 to 4.5:1. Dr. James Combs, Professor, geophysics, UCR suggests the new data from the survey will probably realign the present trend of the anomaly and give a more precise location on the source of the high temperatures.

Jerome S. Nelson, chief geophysicist, Harding-Lawson Associates, states the data and short technical memo will be available in about two weeks by contacting HLA, Box 3030, San Rafael, CA 94903, (415) 452-1400.

CERRO PRIETO STEAM PLANT DEDICATION

On April 4, 1973, the Mexican government officially dedicated the geothermal power plant at Cerro Prieto, Mexico. The present capacity of the plant is 37,500 kw, which will eventually be increased to 75,000 kw with the completion of the second turbine-generator unit. When in full operation, the plant will supply the base load for the cities of Tijuana, Mexicali, and San Luis.

NEW GEOTHERMAL HARDWARE

Nimbus Instruments has developed a new instrument package for the recording and measurement of geothermal noise, microseismic activity and other transient phenomena and the location of foci and hypocenters. The TMA - 100 Series, Dynamic Recording System is a complete analog data processing and recording system which achieves wide flexibility through the use of modular, plug-in electronics to tailor the instrument to a particular application. Any transducer with an electrical output (geophone, stress cell, etc.) can be used with the system so that force, acceleration, displacement, pressure, strain or combinations of these parameters can be measured for spectral analysis. For details contact Nimbus Instruments, 2791 Del Monte St., West Sacramento, California 95691, (916) 372-3800.

GEOTHERMAL GREENHOUSE LASSEN COUNTY, CALIFORNIA

Mr. Philip W. Gutman, President of Hobo Wells Hydroponics, Inc., commenced selling his first crop of hydroponically grown tomatoes in March. This is not very impressive until it is pointed out that this is the first venture of its kind in California, where the sole heat source is geothermal water.

The greenhouse, which is a quonset structure covered with corrugated, translucent fiberglass, is located 28 miles east of Susanville in Honey Lake Valley next to Wendel Hot Springs. This 140' x 26' building contains 1,200 plants each of which, during its lifetime, will be capable of producing approximately 20 lbs. of tomatoes.

During December 1972, when the plants were very young and tender, a severe cold snap plunged temperatures at Honey Lake down to -24° F, yet not a single plant was lost.

Construction is now underway on a second greenhouse which will be operated as a co-op.

Mr. Gutman also plans to use the expended nutrient water from the tomato operations to reclaim adjacent land and to experimentally grow seedling conifers in cooperation with the Division of Forestry.

NEW POWER PLANTS THE GEYSERS GEOTHERMAL FIELD

Signal Oil and Gas Co.

During the last week of March, Signal Oil and Gas Co. and Pacific Gas and Electric Co. signed a contract for a 135 mw power plant (Unit 13). This will be the first geothermal power plant built for Signal and the first to incorporate a new General Electric turbine designed specifically for geothermal steam. Short, stubby blades and corrosion-resistant materials throughout are the distinguishing features of this new generator.

As part of the agreement, Signal will drill three additional development wells, augmenting their Castle Rock Springs production in Secs. 26, 27, and 35 of T. 11 N., R. 8 W., M.D.B.&M., and P.G.&E. will build the plant somewhere nearby, completing it in the fall of 1976.

Union Oil Co. of California

Preliminary hearings with the Public Utilities Commission are nearly completed concerning the siting of Unit 12, a 106 mw plant scheduled for completion in 1975.

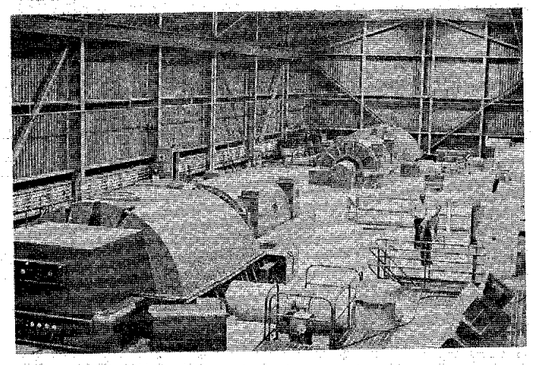
Also, Union has selected a tentative site for Unit 14 (110 mw) near the Little Geysers area of The Geysers field on the south side of Big Sulphur Creek. Soils and geological studies are underway to determine this site's feasibility. It is anticipated that Unit 14 will be completed in 1976.

Pacific Energy Corp.

It was announced recently that Pacific Energy Corp. and Pacific Gas and Electricity Co. are in the final stages of contract negotiations concerning a power plant (Unit 15) to be located in Sec. 14, T. 11 N., R. 9 W., M.D.B.&M., near P.E.C.'s Rorabaugh production in The Geysers field. When this plant is completed, it will be the first built for P.E.C. and may be the second utilizing the G.E. 135 mw generator.

THE GEYSERS GEOTHERMAL FIELD POWER PLANTS PACIFIC GAS AND ELECTRIC COMPANY

Generating Unit	Manufacturer	Net Power Generation	Year of Completion
1	General Electric	11 mw	1960
2	Elliott	13 mw	1963
3	Elliott	27 mw	1967
4	Elliott	27 mw	1968
5	Toshiba	53 mw	1971
6	Toshiba	53 mw	1971
7	Toshiba	53 mw	1972
8	Toshiba	53 mw	1972
9	Toshiba	53 mw	1973
10	Toshiba	53 mw	1973
11	Toshiba	106 mw	1974
12	Toshiba	106 mw	1975
13	General Electric	135 mw	1976
14	Toshiba	110 mw	1976
	Total	853	



Pacific Gas and Electric Co. generating units 5 and 6 at The Geysers. These 53 megawatt generators are typical of those now being installed. The manufacturer, Toshiba, rates the turbine at 55 MW output at a steam input of 100 psig. and 355°F.

OREGON TEMPERATURE STUDY

The Oregon Dept. of Geology and Mineral Industries has published a progress report on their study of temperature gradient and heat flow measurements. This program, to acquire background information for exploration, is funded by a grant from the U. S. Bureau of Mines. The data is available in "The Ore Bin", v. 35, n.1, Jan. 1973.

COMING MEETINGS

Geothermal Short Course 1973

The Short Course sponsored by the Division of Oil and Gas and the Geothermal Resources Council has undergone some program changes. A geothermal meeting in Palm Springs has been scheduled for May 10 and 11, and to avoid conflict the Short Course has been shortened to May 7-9, 1973. To maintain program quality and content, an evening session has been added on Tuesday, May 8. The course enrollment has been increased to meet demand, and the social hours had to be relocated. The two get-togethers will be held at the Top of the Cosmo in the Cosmopolitan Hotel, 13th and N Streets, from 6 to 7 p.m. Monday and Wednesday.

Geothermal Regulatory Conference

Congressman Victor Vesey has called a geothermal regulatory conference for May 10 and 11, 1973 in Palm Springs, California. The purpose of the conference is to eliminate needless duplication and time delays now present within the regulatory structure and to prepare a set of regulatory guidelines that can be used throughout the western United States. The attendees will include representatives from the public, industry, and county, state, and federal governments. *Attendance is by invitation only.*

New Sources of Energy U.S.C. Symposium

The School of Engineering at the University of Southern California will host a symposium on New Sources of Energy. This symposium to be held on May 7 to 9, 1973 will include a session on Geothermal Energy, Wednesday morning May 9. All sessions will be in the auditorium of the Gerontology Center at U.S.C.

Geothermal Energy: Wednesday Morning

Session Chairman:	Jim Combs University of California, Riverside
8:00 - 8:30	George B. Keller Colorado School of Mines Exploration for geothermal energy
8:30 - 9:00	Marshall Reiter New Mexico Institute of Mines and Technology Techniques of heat flow in regional geothermal studies
9:00 - 9:30	Chandler A. Swanberg U. S. Bureau of Reclamation Mesa geothermal anomaly, Imperial Valley, California: An evaluation of various geophysical, geochemical, and geological exploration techniques
9:30 - 10:00	Jim Kuwada Rogers Engineering Company, Inc. Development and utilization of geothermal systems
10:00 - 10:30	Ben Holt, A. J. L. Hutchinson, and Douglas Cortez Ben Holt Co. Advanced binary cycles for geothermal power generation
10:30 - 11:00	Roger Sprankle Hydrothermal Power Co. Helical expander as a geothermal prime-mover
11:00 - 11:30	C. R. Possell U. S. Federal Engineering and Manufacturing Bladeless turbines as a geothermal prime-mover and potential reinjection pump
11:30 - 12:00	Charles L. Dohogne Tifac Inc. Use of titanium in geothermal systems

For further information contact T. F. Yen, Department of Chemical Engineering, University of Southern California, Los Angeles, California 90007.

A.A.P.G. Imperial Valley Field Trip

A two-day field trip covering the Imperial Valley is scheduled as one of the A.A.P.G.-sponsored field trips following the Anaheim Convention in May. Buses will leave from the Disneyland Hotel at 8 a.m., May 17 and will return at 9 p.m., May 18. The $35.00 fee covers transportation, lodging for one night, lunches, and the guidebook.

The trip leaders will be J. E. Kilkenny, Union Oil Co. of California; R. V. Sharp, U.S.G.S.; and P. C. Van De Camp, Comision Federal de Electricidad, who will guide the party through the Chino-Elsinore fault system and some major branches of the San Andreas fault system. Along the way, other interesting features will be seen such as the Coachilla Valley dunes, the ancient shoreline of Lake Coahuila, the Salton Sea, Obsidian Buttes, and the Algodones Sand Hills. Visits will be made to the abandoned CO_2 field at Niland, the mud volcanoes, and the Buttes geothermal area on the first day. The highlight of the second day will be a trip across the Mexican border to the Cerro Prieto geothermal field, which will include a tour of the electrical generating plant, the producing wells, and the Cerro Prieto volcano.

NOTE: Dedication ceremonies were held for the Cerro Prieto geothermal field on April 4.

Rocky Mountain Ground Water Conference

As part of the Rocky Mountain Ground Water Conference, May 24 and 25, in Bozeman, Montana, there will be a panel discussion on geothermal resources. The panel members will be Reid Stone, U. S. Department of the Interior; Herb Rogers, Rogers Engineering Co., Inc.; Malcolm Mossman, Anschutz Corp.; and Richard Pearl, Colorado Geological Survey. Among the subjects to be discussed by the panel are:

1. The U. S. Government's geothermal leasing program
2. Low temperature heat exchangers
3. Geological and geochemical aspects of geothermal systems

For additional information contact Donald Coffin, U.S.G.S., Water Resources Division, P. O. Box 1696, Helena, Montana 59601.

World Geothermal Conference 1975

Preliminary planning is underway on a World Geothermal Conference scheduled to be held in San Francisco in 1975. The conference will probably be sponsored by both the Federal Government and the State of California, with the United Nations and the Geothermal Resources Council acting as co-hosts.

Because of the delay and uncertainty in the scheduling of the world conference, which could have conflicted with the proposed Geothermal Resources Council conference in September 1973, the Council had to alter conference plans. In place of the G.R.C. Technical Conference, a one-day Council business meeting will be held at the Sheraton-Palace Hotel on September 27 followed by a field trip to Lake County on the 28th. Watch the "Hot Line" for details.

WELL OPERATIONS

IMPERIAL COUNTY, CALIFORNIA

Magma Energy, Inc.

Magma has drilled one well, "Bonanza" 1 (Sec. 22, T. 15 S., R. 14 E., S.B.B.&M.), of a four-well program in Imperial Valley to an unspecified depth below 4,500'. Tubing has been cemented in the hole, and temperature surveys will be run in the near future.

"Sharp" 2 (Sec. 34, T. 16 S., R. 16 E.), the second well in the program, was spudded during the first week of April. NOTE: The location reported for this well in v. 3, n. 1 of the "Hot Line" was incorrect. Above is the correct location.

East Mesa

The Bureau of Reclamation has announced plans for the next phase in their evaluation of the East Mesa area. Their program is to drill eight deep holes (to a maximum of 6,000 feet each) and thirty shallow holes (100 to 1,500 feet each) for temperature measurement. Two of the deep holes will be drilled in the 1972-73 fiscal year, and the remaining holes are planned for the following fiscal year. The Bureau drilled their 8,000-foot "Mesa" 6-1 well in this area in 1972.

Salton Sea Geothermal Field

Magma Power Co.

Magma reported a bottomhole temperature of 610° F at 3,000' in "Magmamax" 3 (Sec. 33, T. 11 S., R. 13 E., S.B.B.&M.).

LAKE COUNTY, CALIFORNIA

Signal Oil and Gas Co.

On March 21, 1973, Signal suspended drilling operations at "Bianchi" 1, located about one mile north of their Castle Rock Springs wells in The Geysers field, and the rig was removed.

The original hole, spudded November 11, 1972, was drilled entirely in graywacke to a total depth of 8,520'. Downhole temperatures were disappointing. On January 14, 1973, the original hole was plugged back and a redrill hole was kicked off at 3,427'. After encountering numerous drilling difficulties, this hole was finally bottomed at 7,088' on March 21, at which time operations were suspended. Again, downhole temperatures were disappointing.

However, counteracting the frustrations suffered at "Bianchi" 1, Signal signed a contract with P.G.&E. at the end of March for a 135 mw generating plant to be located somewhere near their Castle Rock Springs production. This plant is scheduled for completion in 1976.

Commencing in August 1973, three additional development wells will be drilled at Castle Rock Springs, to augment present production.

E. B. Towne, Operator

E. B. Towne has announced plans to drill a geothermal test well in close proximity to "Sullivan" 1, an exploratory well drilled and abandoned by E. B. Towne in the final months of 1972. The operator would like to begin drilling operations by the end of May 1973. The "Sullivan" 1 well is approximately 950' N. and 1,500' E. from the SW corner of Sec. 18, T. 12 N., R. 8 W., M.D.B.&M.

Pacific Energy Corp.

Weather permitting, P.E.C. will commence deepening their "Kettenhoffen" 1 well (see "Hot Line", v. 3, no. 1) from 7,822' to 10,000' before Easter. The well site, in Sec. 28, T. 13 N., R. 8 W., M.D.B.&M., is on bottomland which has been flooded for months. However, the well site is slowly drying out, and it is anticipated that it will soon be possible to move in a rig.

LASSEN COUNTY, CALIFORNIA

Gulf Oil Corp.

Notices of intention to drill have been filed with the Division of Oil and Gas for two exploratory geothermal wells in Honey Lake Valley. The first, "Honey Lake" 1-ST, will be near Amedee Hot Springs at a point 1,980' S. and 1,980' E. from the NW corner of Sec. 5, T. 28 N., R. 16 E., M.D.B.&M. "Honey Lake" 2-ST will be drilled near Wendel Hot Springs at a point 1,980' S. and 660' E. from the NW corner of Sec. 25, T. 29 N., R. 15 E., M.D.B.&M. It is anticipated that drilling operations will begin in early June.

This will be Gulf's first venture into exploring for geothermal energy.

MODOC COUNTY, CALIFORNIA

Gulf Oil Corp.

Two notices were filed with the Division of Oil and Gas for exploratory geothermal wells to be drilled in Surprise Valley this summer.

"Surprise Valley" 1-ST will be 990' N. and 2,310' E. from the SW corner of Sec. 30, T. 44 N., R. 16 E., M.D.B.&M. near Lake City, California. The other well, "Surprise Valley" 2-ST, will be drilled near Leonard's Hot Springs at a point 330' N. and 330' W. from the SE corner of Sec. 13, T. 43 N., R. 16 E., M.D.B.&M.

NOTICE

Subscriptions must be renewed for 1973. This is the last issue of the "Hot Line" which will be sent to 1972 subscribers.

--Renew Now--

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