

GL02864-1a2

→ APR

FC  
586



FC  
586

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY  
Area Geothermal Supervisor's Office  
Conservation Division, MS 92  
345 Middlefield Road  
Menlo Park, CA 94025

UNIVERSITY OF UTAH  
RESEARCH INSTITUTE  
EARTH SCIENCE LAB.

FEB 8 1970

Memorandum

To: Interested Parties

From: <sup>Acting</sup> Area Geothermal Supervisor

Subject: Plan of Operation, Federal Leases N-8377, N-8378, N-8383,  
N-10362, N-18423, N-18424, Churchill County, NV, (Phillips)  
Petroleum Company  
Ref: 1760 (2403-01a) N-8377 (POO for EA #124-9)

Phillips Petroleum has submitted a Plan of Operation pursuant to 30 CFR 270.34 for permission to drill, test and complete (if economically feasible) one (1) +3048 meter (10,000') geothermal exploratory test well, Well #14-23 (B23-1) on private land in the Brady Hazen KGRA. Phillips also has proposed that its Federal geothermal leases N-8377, N-8378, N-8383, N-10362, N-18423 and N-18424 totalling approximately 3,125 hectares (7,722 acres) be combined with approximately 6,529 hectares (16,133 acres) of other Federal and private land to form Desert Peak Unit in Churchill County, NV.

Since the subject well site is within the proposed Desert Peak Unit, if drilled subsequent to the approval of the Unit, it will become the first Unit well and drilling operations will be under the supervision of the Reno District Geothermal Supervisor, in compliance with applicable Federal regulations and requirements, particularly 30 CFR Subparts 270 and 271, 43 CFR Subparts 3000 and 3200 and Geothermal Resource Operational Orders pursuant to 30 CFR 270.12.

Therefore, an Environmental Analysis EA #124-9 will be prepared by the Office of the Area Geothermal Supervisor for the proposed action. No field inspection is scheduled since the well site is on private land (not yet approved as a Federal Unit). Access road has been constructed, the site has been prepared, pits have been dug and 15.24 meters (50') of conductor pipe have been installed. For further information concerning the Phillips proposal, contact the Reno District Geothermal Supervisor 702-784-5676, FTS 470-5676, Kietzke Plaza, Bldg. D, Suite 137, 4600 Kietzke Lane, Reno, NV 89502.

Comments concerning the proposed action should be received no later than February 27, 1979 by:

Area Geothermal Supervisor  
USGS - Conservation Division  
345 Middlefield Road, MS-92  
Menlo Park, CA 94025  
(415) 323-8111 X2848, FTS 467-2848

We urge you to send written commentary and will appreciate hearing from you even if you are of the opinion that the existing regulations, lease terms, and operational orders provide adequate environmental protection. All comments will be given serious consideration in the preparation of the environmental analysis and any subsequent conditions of approval thereafter.

The Area Geothermal Supervisor's Office will not send draft Environmental Analysis (EA#124-9) to interested parties for review for the proposed actions. Certain parties however, such as the surface managing agency, lessee, and the Geothermal Environmental Advisory Panel (GEAP) will receive a copy of the completed EA#124-9. Other interested parties will not receive a copy of the final EA unless such parties comment on the proposed actions in writing or request a copy of the EA pursuant to the Freedom of Information Act. Copies of the Environmental Analysis are available for inspection during normal business hours at the Area Geothermal Supervisor's Office, the appropriate District Geothermal Supervisor's Office, and the appropriate Bureau of Land Management, District Manager's Office.

*Barry A Boudreau*

INTERESTED PARTIES EA #124-9

Phillips Petroleum Company  
One 8000' Exploration Well

Proposed Desert Peak Unit  
Reedy-Hazen KGRA

\* \* \* \* \*

District Geothermal Supervisor  
USGS, Conservation Division  
Kietzke Plaza, Blou. D, Suite 137  
4600 Kietzke  
Reno, Nevada 89502  
\*FIS: 470-5676 Comm: 704-784-5676

Conservation Manager, Western Region  
ATTN: Environmental Staff  
USGS, Conservation Division  
345 Middlefield Rd., MS 80  
Menlo Park, California 94025  
\*FIS: 467-2108 Comm: 415-323-8111

Mr. Henry Cullins  
Area Geologist, Pacific Area  
USGS-Conservation Division  
345 Middlefield Road, MS 80  
Menlo Park, California 94025  
\*FIS: 467-2053 Comm: 415-323-8111

Dr. G. D. Robinson, Chairman  
Geothermal Environmental Advisory  
Panel  
345 Middlefield Road, MS 19  
Menlo Park, California 94025  
\*FIS 467-2871 415-323-8111 Y2871

U.S. Bureau of Land Management  
Geothermal Specialist  
ATTN: Theodore W. Holland  
Denver Fed. Center, B. 50 (D-310)  
Denver, Colorado 80225  
\*FIS: 234-5098 Comm: 303-234-5098

Nevada State Director  
Bureau of Land Management  
Federal Building, Room 3009  
300 Booth Street  
Reno, Nevada 89502  
\*FIS 470-5451 Comm: 702-784-5451

Winnemucca District Manager  
Bureau of Land Management  
P.O. Box 71  
Winnemucca, Nevada 89445  
\*FIS: 470-5423 Comm: 702-623-3676

Carson City District Manager  
Bureau of Land Management  
1050 E. Williams Street, Suite 335  
Carson City, Nevada 89701  
\*FIS 470-5612 Comm: 702-882-1631

U.S. Bureau of Reclamation  
ATTN: Lloyd Oshourne  
Post Office Box 640  
Carson City, Nevada 89701  
\*Tel: (702) 882-3436

U.S. Fish and Wildlife Service  
ATTN: Field Superv. Ecological Serv  
2800 Cottage Way  
Sacramento, California 95825  
\*FIS: 468-4516 Comm: 916-494-4516

U. S. Fish and Wildlife Service  
ATTN: Gail Kobetich  
Endangered Species Office  
2800 Cottage way, Room E-2720  
Sacramento, California 95825  
\*FIS: 468-4516 Comm: 916-494-4516

U.S. Environmental Protection Agency  
Environmental Monitoring &  
Support Laboratory  
ATTN: Michael O'Connell  
P.O. Box 15027 Las Vegas, Nv 89114  
\*FIS: 595-2969 Comm: 702-736-2969

U.S. Department of Energy, Nevada  
Operations Office  
ATTN: John Cummings  
Post Office Box 14100  
Las Vegas, Nevada 89114  
\*FIS: 598-3591 Comm: 702-734-3591

U.S. Department of Energy  
Division of Geothermal Energy  
ATTN: Rennie Disono  
20 Massachusetts Avenue, NW  
Washington, D.C. 20545  
\*FIS: 376-1690 Comm: 202-376-1690

Geothermal Resources Council  
Attn: Mr. David Anderson  
P.O. Box 98  
Davis, CA 95616  
\*Comm: 916-756-2360

Ms. Mary Rusco, Archaeologist  
Nevada State Museum  
600 N. Carson Street  
Carson City, Nevada 89701  
\*Tel: (702) 885-4810

INTERESTED PARTIES for EA #124-9

State Of Nevada  
 Department of Energy  
 1050 E. William, Suite 405  
 Carson City, Nevada 89701  
 \*Tel: (702) 885-5157

Mr. Ray Corlett, Regional Manager  
 Nevada Dept. of Fish and Game  
 380 West 8 Street  
 Fallon, Nevada 89406  
 \*Tel: (702) 423-3171

State of Nevada, Div of Historic  
 Preservation and Archaeology  
 ATTN: Kimberly Wood, SRP  
 201 South Fall St. Capitol Complex  
 Carson City, Nevada 89710  
 \*Tel: (702) 885-5138

State of Nevada, Div of State Lands  
 ATTN: Mary Lee Caronberg  
 201 S. Fall Street  
 Capitol Complex, Rm. 339  
 Carson City, Nevada 89710  
 \*Tel: (702) 885-2363

State of Nevada  
 Division of Water Resources  
 C/O State Engineer  
 201 South Fall Street  
 Carson City, Nevada 89710  
 \*Tel: (702) 885-4380

Churchill County, Board of  
 Commissioners  
 10 West Williams Street  
 Fallon, NV 89406  
 \*Tel: (702) 423-4092

Lawrence Livermore Laboratory  
 Box 5507, Mail Code L-523  
 Livermore, California 94550  
 \*FTS 532-1100 Com: 415-422-1100

Exploration Geologists of Nevada  
 ATTN: Ralph D. Vulhollen  
 P.O. Box 3043  
 Reno, Nevada 89505

State of Nevada, Environ Protection  
 Agency Svcs, Dept of Cons & Res  
 ATTN: Wendell McCurry, Vern Ross  
 201 Fall Street  
 Capitol Complex, Nevada 89710  
 \*Tel: (702) 885-4670

State of Nevada  
 Department of Fish and Game  
 ATTN: Mr. Dale V. Lockhard  
 Post Office Box 10678  
 Reno, Nevada 89510  
 \*Tel: (702) 784-6214

Department of Human Resources  
 ATTN: Larry Werner  
 Capitol Complex  
 1209 Johnson Street  
 Carson City, Nevada 89710

State of Nevada, Planning Coordinator  
 ATTN: Bob Hill  
 1050 E. Williams, Suite 402  
 Capitol Plaza  
 Carson City, Nevada 89701  
 \*Tel: (702) 885-4865

State of Nevada, Pershing County  
 ATTN: E.L. Spencer  
 Pershing County Planning Director  
 Route 1, box 71-D  
 Lovelock, Nevada 89419  
 \*Tel: (702) 273-2036

Earth Science Lab.-University of Utah  
 Research Institute, Research Park  
 ATTN: Phillip M. Wright  
 391 Chipeta Circle  
 Salt Lake City, Utah 84108  
 \*Tel: (801) 581-5226

Mrs. Margaret Williams  
 Director, Northern Nevada Native  
 Plant Society  
 P.O. Box 8965  
 Reno, Nevada 89507

Chevron USA, Inc.  
 ATTN: J.S. Turner and Pat Smith  
 Post Office Box 3722  
 San Francisco, California 94119  
 \*Tel: (415) 894-2726

INTERESTED PARTIES for EA #124-9

Getty Oil Company  
 ATTN: Mr. Dan W. Sparks  
 Post Office Box 5237  
 Bakersfield, California 93308  
 \*Tel: (805) 390-2961

Hydrosearch, Inc.  
 333 Flint Street  
 Reno, Nevada 89501  
 ATTN: Mr. Mark Reece  
 \*FTS One: 470-5911 702-322-4172/3

Occidental Geothermal, Inc.  
 ATTN: R.J. Wyant  
 5900 Stockdale Highway  
 Bakersfield, California 93309  
 \*Tel: (805) 327-7351

Republic Geothermal, Incorporated  
 ATTN: Mr. Dwight Carey  
 Post Office Box 3388  
 Santa Fe Springs, California 90607  
 \*Tel: (213) 945-3661

Sunoco Energy Development Company  
 ATTN: Mr. John Williams  
 Suite 1500 -- Box 9  
 12700 Park Central Place  
 Dallas, Texas 75251  
 \*FTS One: 749-1011 214-233-2600

Southland Royalty Company  
 ATTN: Jere Denton  
 1000 Fort Worth Club Tower  
 Fort Worth, Texas 76102  
 \*FTS One: 334-3001 (817)344-9200

Anadarko Production Company  
 ATTN: Mr. John D. Syotak  
 Post Office Box 1330  
 Houston, Texas 77001  
 \*FTS One: 527-4011 713-526-5421

Mr. Clyde E. Kuhn  
 Post Office Box 69  
 Davis, California 95616

Mr. Jack McNamara  
 10850 Wilshire Blvd, Suite 700  
 Los Angeles, California 90024  
 \*Tel: (213) 475-4933

Gulf Mineral Resources Company  
 Exploration Department  
 ATTN: Mr. Glen Cambell  
 1720 South Belaire Street  
 Denver, Colorado 80222  
 \*FTS One: 327-0111 303-758-1700

Magma Power Company  
 ATTN: Mr. Richard Foss  
 631 S. Witmer Street  
 Los Angeles, California 90017  
 \*Tel: (213) 463-2285

Phillips Petroleum Company  
 ATTN: R.L. Forest  
 Energy Minerals Division  
 Post Office Box 10566  
 Reno, Nevada 89510  
 \*Tel: (702) 786-2273

Shell Oil Company  
 ATTN: Mr. F.W. Nantker  
 Post Office Box 92047  
 Worldway Center  
 Los Angeles, California 90009  
 \*Tel: (805) 648-2751

Republic Geothermal, Incorporated  
 ATTN: J. L. Scheidenberger  
 1101 Colledge Avenue, Suite 220  
 Santa Rosa, California 95404  
 \*Tel: (707) 527-7755

Aminoil USA, Incorporated  
 ATTN: Mr. J.W. Kunau  
 Post Office Box 11279  
 Santa Rosa, California 95406  
 \*FTS One: 623-1011 707-527-5333/2

Phillips Petroleum Company  
 Geothermal Operations  
 Post Office Box 239  
 Salt Lake City, Utah 84110  
 \*Comm: 801-364-2083

Mr. Warren M. Woodward  
 125 Drew Drive  
 Reno, Nevada 89502  
 \*FTS 470-5911 702-925-3079

PROPOSED PLAN OF OPERATIONS

TO DRILL THE UNIT WELL, B23-1 (14-23)  
AT DESERT PEAK, CHURCHILL COUNTY, NEVADA

Proposed operations: Drill a geothermal well between  
8000 and 10,000 feet deep

Objective: To continue evaluating the Desert Peak  
geothermal reservoir

Estimated starting date: February or March 1979

Estimated completion date: May or June 1979

Phillips Petroleum Company

Geothermal Operations

P. O. Box 10566

Reno, Nevada 89510

Telephone: 702 786-2273

Contractor

Peter Bawden

Field Supervisors:

R. T. Forest (702) 786-2273

W. R. Benoit (702) 786-2273

O. C. Rolls (801) 364-2083

B. McComack (702) 273-7507

TABLE OF CONTENTS

	Page
Introduction . . . . .	1
I. Well Locations . . . . .	2
II. Roads and Access . . . . .	2
III. Cultural Resources . . . . .	2
IV. Location of Water Supply . . . . .	2
V. Camp Sites, Air Strips and Other Supporting Facilities . .	3
VI. Other Areas of Potential Surface Disturbance . . . . .	3
VII. Topographic Features of the Land and the Drainage Patterns	3
VIII. Methods of Disposing of Waste Material . . . . .	3
IX. Protection of the Environment . . . . .	4
X. Crew Size and Housing . . . . .	5
XI. Regional and Local Geology . . . . .	6
XII. Regional and Local Hydrology . . . . .	6

ATTACHMENTS

Exhibit A	Topographic Map . . . . .	Map Pocket
Exhibit B	Well Site Location Map . . . . .	Map Pocket
Exhibit C	Well Site Equipment Location Plat . . . . .	3-A
Exhibit D	Optional Drilling and Testing Activities . . . . .	7
Exhibit E	Typical Well Test Procedure for a Liquid-Dominated Reservoir . . . . .	10

## Introduction

Phillips Petroleum Company proposes to drill an 8000-10,000 foot geothermal well near Desert Peak, Nevada. This well is to be the unit well for the Desert Peak geothermal unit. The well is located on private land, however, in accordance with the unitization procedure this Plan of Operations, together with attached exhibits, is submitted for approval to undertake the proposed work.

This well will be the fourth deep geothermal test well drilled near Desert Peak. All three previous wells were located on private land, consequently no previous plans of operation have been written in the area.



## I. Well Location

The well location is in the SW $\frac{1}{4}$  of the SW $\frac{1}{4}$  of the NW $\frac{1}{4}$  of Section 23, T22N-R27E. It is located 500.35 feet on a bearing of N52°45'E from the west quarter corner of Section 23 as shown on Exhibit A. The well location is also shown on Exhibit B, a topographic map of the area. Exhibit B does not show the presence or locations of roads and drill pads recently constructed on private lands (odd numbered sections) by Phillips Petroleum.

## II. Roads and Access

Access to the site is via about 11 miles of graveled road from the Hot Springs-Nightingale interchange on U. S. Highway I-80. All but the first mile of this road will need to be regraded before drilling commences. Periodic grading may be necessary during drilling operations. Water will periodically be applied to the road to minimize dust.

The road to the drill site has already been constructed. Other than routine maintainance no further road construction is planned.

## III. Cultural Resources

The access roads, mud sumps, and drill pad have already been prepared. Prior to construction no artifacts were observed at the site. There appear to be very few archaeological sites, if any, within the Hot Springs Mountains. Therefore, it is felt to be highly unlikely that any sites were destroyed by the previous construction activity.

## IV. Location of Water Supply

All water used will come from an artesian dug well located in the NE $\frac{1}{4}$  of Section 35, T22N-R26E. This is a 100 foot square dug well lined with boards. This well has been the water source for three previous deep wells

at Desert Peak. During peak periods of pumping the water level in the well drops three or four feet, however, there is still abundant water in the nearby marsh for livestock and any other birds or animals. -2-

#### V. Camp Sites, Air Strips and Other Supporting Facilities

No campsites, air strips or other supporting facilities will be constructed.

#### VI. Other Areas of Potential Surface Disturbance

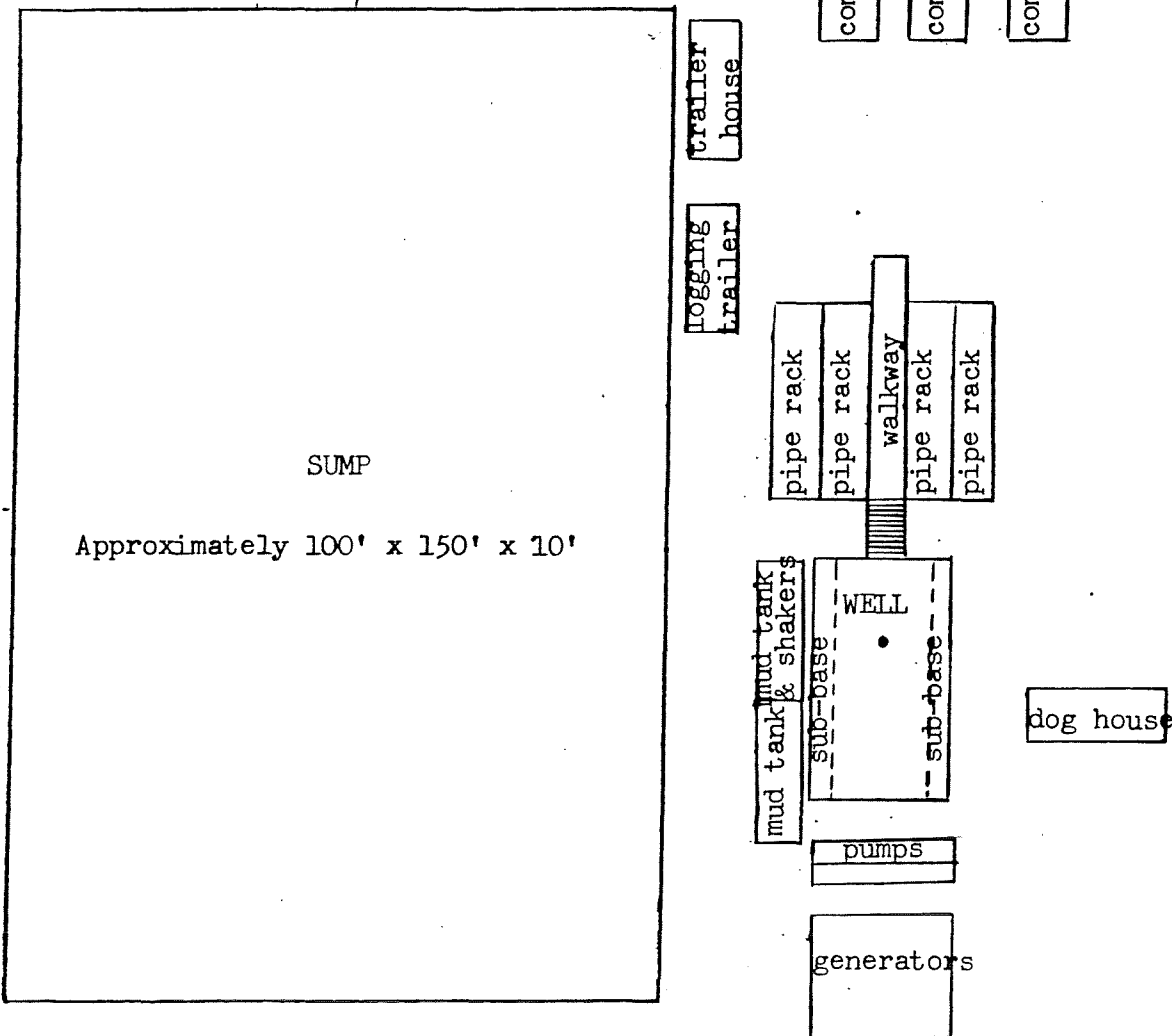
During testing of B23-1 (14-23) reservoir water may flow downhill from the well onto the far eastern edge of Section 22. This water will rapidly sink into the sand. During a three month flow test of well B21-2 in Section 21 water was allowed to flow into the sandy wash south of the well. All water had soaked into the sand within  $\frac{1}{4}$  mile of the well. No detrimental effects were observed and erosion of the sand was very minor. Now the area of the wash which contained flowing water is marked by denser than normal vegetation. The groundwater in the area is at a depth of 400 to 500 feet and is composed of thermal water which is, and for the past 3000 years has been, leaking out of the geothermal reservoir into subsurface aquifers. Allowing reservoir water to flow on the surface will not contaminate any higher-quality surface or subsurface waters.

#### VII. The Topographic Features of the Land and the Drainage Patterns

Topographic features and drainage patterns are depicted on Exhibit B, a composite map made from four USGS topographic maps.

#### VIII. Methods of Disposing of Waste Material

Reserve pits will be located adjacent to each drill pad for containment



SUMP  
Approximately 100' x 150' x 10'

Location: Approximately 250' x 300'

of all drilling fluids.

If the well is completed as a producing well the reserve pits will be left intact for future use during testing, workovers, or deepening.

If the well is not completed as a producing well the reserve pits will be evaporated to dryness and then reclaimed by filling and grading.

Effluents produced during testing operations will be allowed to flow in the natural drainage (see Exhibit D). Any steam which is flashed during testing will be vented to the atmosphere.

A burn pit will be used at each drill site for the disposal of flammable waste materials such as mud sacks and rags. Solid waste such as cans and bottles will be placed in a pit which will be covered over with dirt after the drill rig has been removed from the location.

A "sanihut" will be provided for the use of the drilling crews and other personnel working on the drilling operation.

#### IX. Protection of the Environment

The area is uninhabited so noise will not be a problem.

No rare and/or endangered species are known to inhabit the area.

This section describes the measures proposed to effectively minimize environmental damage and conduct operations in a manner consistent with rules and regulations and specific actions required by the Authorized Officer regarding prevention and control of:

##### 1. Fire

- a. Water and fire extinguishers will be kept available at all times at each location.
- b. Every reasonable effort will be made to prevent fires. In the event a fire should occur on or near lands occupied by Phillips initial attack action will be made by making available such construction equipment and maintenance forces that are available.

2. Soil Erosion and Subsidence

- a. Due care will be exercised to avoid unnecessary scarring or removal of ground vegetative cover.
- b. Vehicular travel will be confined to roads and trails.
- c. Work requiring the use of wheeled or tracked vehicles will be conducted in such a manner as to minimize surface damage.

3. Pollution of Surface and Groundwaters

- a. The quality of water in the area is such that produced fluids will not degrade existing waters.

4. Damage to Fish and Wildlife

- a. Unattended reserve pits containing fluids will be fenced to keep out livestock and wildlife.
- b. No additional surface area will be disturbed.

5. Air and Noise Pollution

- a. Mufflers will be used on rig engines and compressors as standard equipment.

6. Hazards to Public Health and Safety

Phillips will regulate access in those areas where unrestricted access would unduly interfere with operations under the lease, or would constitute a hazard to health and safety.

X. Crew Size and Housing

The drilling contractor is Peter Bawden Drilling Company of Long Beach, California. It is estimated that the drilling crew will number approximately 25 persons. The crew will be housed in available housing in Lovelock, Fallon, and/or Fernley, Nevada.

Construction personnel will be local contractors from Lovelock, Fallon, or Fernley, Nevada. It is expected that they will work from their homes.

## XI. Regional and Local Geology

A lithologic log of Strat. Test #7, a 1944 foot deep slimhole located about 200 feet north of the proposed well is included as Exhibit C. This log shows the geology to a depth of 1944 feet. Below 1944 feet it is expected the hole will continue in Tertiary rhyolitic rocks to a depth of about 3500 feet. At this level low-grade metamorphic rocks of Mesozoic age will be encountered. It is possible intrusive rocks will be penetrated below depths of 4000 feet.

## XII. Regional and Local Hydrology

The hydrology is very poorly understood to date. All water samples presently available in the area are moderately saline sodium-chloride waters with from 7000 to 12,000 ppm total dissolved solids.

EXHIBIT D  
OPTIONAL DRILLING AND TESTING ACTIVITIES

Conditions encountered in the hole during the course of drilling may indicate the necessity and feasibility of undertaking any of several activities to aid in further understanding the resource in the ground and the ability to extract it safely and economically. Downhole conditions which may prompt such activities include high temperatures, presence of fractures, presence of formation fluids, alteration, secondary mineralization, and presence of geothermal gases.

Activities that may be desirable or necessary include:

1. Obtaining cores.
2. Running liners to stabilize the bore walls or case off relatively cold water zones.
3. Perforating.
4. Side tracking.
5. Short-term flow tests through manifold and block line with the rig on location to determine flow characteristics of the well.
6. Short-term flow tests with the rig off to determine flow characteristics of the well and pressure draw down and build up phenomena in the reservoir.
7. Plugging back.
8. Deepening.
9. Plugging and abandoning.
10. Making casing tests.
11. Redrilling.
12. Repairing.
13. Short-term injection tests.

Testing Activities

1. Formation Testing

In the event drilling data and evaluation criteria indicate that a potentially commercial geothermal reservoir has been penetrated, a steam control head will be installed on the Master Gate. The assembly consisting of access port, kill line, and flow choke or other approved assembly will be tested to contain maximum well-head pressure of a fully developed flow based on drill pressure confinement with suitable safety allowance for maximum anticipated steam temperatures. Formations to be tested will be opened to the well bore. Minimum flow to characterize formation and well installation will be produced to surface reserve pits.

A typical testing program is included as Exhibit E.

## 2. Resource Characterization

A program for characterizing the resource includes determining geothermal gradients and the sampling and analysis of geothermal resources.

- a. Geothermal gradients - A wire-line temperature survey, or surveys, are run in the well to obtain data necessary to calculate geothermal gradients.
- b. Sampling and analysis of geothermal resources - A typical sampling program is included in Exhibit E. Fluid samples are submitted to commercial laboratories and to Phillips Petroleum Company R & D for analysis. Samples are routinely analyzed for boron, calcium, magnesium, potassium, sodium, ammonium, chloride, combined nitrate and nitrite, silica, sulfate, combined carbonate and bicarbonate, pH and conductivity. Selected waters are analyzed for all of the above, plus lithium, strontium, arsenic, fluoride, barium, iron, hydroxide, carbonate and bicarbonate.

Emission spectrographic qualitative analysis may be run on a limited basis



for the elements Ba, B, P, Fe, Mn, Mg, Pb, Cr, Si, Al, Mo, Sn, V, Li, Cd, Cu,  
Na, Zn, Ti, Zr, Ni, Co, Sr, Ca, As.

=

## EXHIBIT E

### TYPICAL WELL TEST PROCEDURE FOR A LIQUID-DOMINATED RESERVOIR

1. Determine status of fluid column in adjacent wells. Prepare to measure and record pressures at the wellhead and in the flow line while the testing of the well is under way.
2. Obtain wellhead pressure, wellhead temperature, and temperature gradient on the wildcat well while the well is shut in.
3. Start well to flow at nearly the capacity of the well at a constant rate. This flow will be a cleanup flow and should be considered as one point of an isochronal test. Duration of flow can range from hours to weeks.
4. Take wellhead pressures, temperatures, measurements and orifice-meter flow rates while well is flowing. Also collect water samples.
5. When well is shut in, get wellhead pressure buildup and temperatures at the same frequency as drawdown test, including instantaneous shut-in pressures to catch peak wellhead pressure. Continue shut in until wellhead pressures and temperatures stabilize or a maximum of probably not more than 24 hours.

Some modification of the above may be required if the reservoir is of the vapor-dominated type.