A Compilation of Data on Fluids from Geothermal Resources in the United States
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A Compilation of Data on Fluids from Geothermal Resources in the United States

S. R. Cosner and J. A. Apps

May 1978

Earth Sciences Division
Lawrence Berkeley Laboratory
University of California
Berkeley, California 94720

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COMPILATION OF DATA ON FLUIDS FROM GEOTHERMAL RESOURCES IN THE UNITED STATES

by

S. H. Cosner and J. A. Apps.

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Lawrence Berkeley Laboratory
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Berkeley, California 94720

Prepared for the U.S. Department of Energy under
Contract W-7405-ENG-48
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A Compilation of Data on Fluids From Geothermal Resources in the United States
S. R. Cosner and J. A. Apps

I. INTRODUCTION

A. Background

The commercial development of geothermal energy for power and heating is receiving serious attention in the United States. Many resources are being investigated intensively, and the design and testing of geothermal systems and components is under way, both in government laboratories and in the private sector.

Geothermal energy can be extracted from resources containing native steam, hot water, geopressed water, hot dry rock, and magma. The most important resources in terms of immediate development potential are those containing hot water. Such resources are generally known as "liquid dominated," in contrast to "vapor dominated" or native steam sources.

Liquid dominated resources vary substantially in size, temperature, and fluid composition. The fluid composition can lead to many technical problems when such resources are exploited, including scaling, sludge formation, corrosion, and erosion in surface facilities; the disposal of noncondensable gases; the treatment of toxic gases, volatiles and precipitates; and the disposal of spent fluids. Geothermal fluids also have differing thermodynamic and transport properties from pure water, and these must be taken into account during geothermal power plant design. A knowledge of geothermal fluid characteristics is therefore important in anticipating such problems.

The purpose of this compilation is to provide information on the chemistry of geothermal fluids to scientists and engineers involved with the development of liquid dominated geothermal energy resources. The compilation is a comprehensive tabulation of available geothermal fluid data from the most important geothermal resources in the United States.
The compilation was funded by the Division of Geothermal Energy of the Department of Energy.

B. Scope of the Compilation
   1. Resources Selected

   The resources selected for this compilation were determined primarily from White and Williams. Liquid dominated resources, with a heat capacity exceeding $1 \times 10^{18}$ cal and temperatures greater than 90°C, were candidates for inclusion in the data compilation. (Yellowstone National Park, however, was omitted because exploitation of the geothermal resources in national parks is prohibited.) Thirty-four candidates were identified in White and Williams. In addition, resources at Cerro Prieto in Mexico, and Puna in Hawaii were included. The former was added because of its relevance to other geothermal resources in the Imperial Valley, California, and the latter because of significant drilling results obtained in 1977.

   The resources chosen were those most likely to be exploited for geothermal energy during the next ten years. Particular importance was attached to their potential for electric power generation.

   Only information on the chemical composition of fluids from wells was compiled. Hot spring analyses were not collected because such analyses are not considered to be representative of geothermal fluids found at depth within a geothermal reservoir. Furthermore, the U.S. Geological Survey is conducting a separate program to collect data on hot springs in the United States.2

   Data from 17 resources were obtained by searching the literature as far back as 1929, and by collecting data from companies working in the geothermal energy field. Much of the data held by the private sector remains confidential because of the need to protect corporate investments in a promising geothermal area. For this reason information is lacking from wells drilled recently in such locations as Valles Caldera KGRA, New Mexico (Baca location No. 1); Brawley KGRA, Imperial County, California; and Roosevelt Hot Springs KGRA, Beaver County, Utah.
2. Information Compiled

A complete listing of the kinds of information that could possibly be compiled for each sample is shown in Table 1. Not all information, however, could be found for each sample analysis. All information is recorded as found in the source document. No attempt, for example, was made to standardize units of measurement for the concentrations of components in solution.

Caution must be exercised in using the data in this compilation. The data come from a large variety of sources and are of variable quality. Users should consider the type of sample, the way it was obtained, the completeness of the analysis, the analytical methods, and the units of measurement used for reporting the results. Some samples may have been analyzed long after the sampling, leading to interim oxidation, precipitation, or evaporation of some of the constituents.

It should be recognized that geothermal fluids are rarely, if ever, uniform in composition. The analysis given for a particular geothermal well may not be representative of the resource as a whole. It may be little more than a reflection of unspecified mixtures of fluids or differing compositions from different horizons within a well. The composition of geothermal fluids can also change with time. Compositional fluctuations may occur in a flowing well during time periods as short as one hour.

C. Computer Processing

1. Storage of and Access to the Data

The compilation of geothermal fluid data has been processed and stored at Lawrence Berkeley Laboratory, using the Berkeley Data Base Management System (BDMS). This system is a generalized information retrieval system offering a broad range of capabilities for creating, maintaining, and accessing computer data bases. BDMS consists of an easy-to-use data base definition language, an editor that stores, modifies, and retrieves data, and a system that searches the data base for indices specified by the user.
Table 1. Data elements of geothermal fluid data compilation.

**PRELIMINARY INFORMATION**

- Record number
- Code name (well name and a unique letter for each record of data from that well)
- Type of sample (water, steam condensate, noncondensable gases)
- Well name
- KGRA or geothermal field
- Location (township, range, section, quarters, or other delineation)
- County
- State
- Country
- Well owner
- Lessee of well
- Drilling company
- Dates drilled

**WELL DATA**

- Well depth (in meters)
- Temperatures (in degrees Celsius)
- Depth or location of temperature reading
- Shut-in pressure
- Flow information (flow rates and pressures)
- Well casing perforation interval
- Lithology of production zone
Table I. Data elements of geothermal fluid data compilation (continued).

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<td>- Location sample taken</td>
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<td>- Sampling method</td>
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<tr>
<td>- Condition of sample when taken (temperature, pressure, whether fluid lost due to steam flashing)</td>
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<tr>
<td>- Condition of well when sample taken (flow time before sampling, flow rate, etc.)</td>
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<td>- Specific gravity, temperature of reading</td>
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<tr>
<td>- Viscosity of fluid</td>
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<td>- Total dissolved solids, whether sum of analysis or residue on evaporation</td>
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<td>- Total alkalinity</td>
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Table 1. Data elements of geothermal fluid data compilation (continued).

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<th>OTHER NOTES</th>
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<td>Other important information</td>
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The compiled geothermal fluid data are stored in the database as records. Within each record, data are stored under data elements defined by the database user. Over 50 elements were defined for use in the geothermal fluid data compilation as shown in Table 1. Few records contain all of the data elements because the information compiled was usually incomplete.

Each record documents a specific sample analysis from one well. In those cases where there is more than one analysis for a well, there are multiple records for the well. An attempt was made to place the most reliable analysis in the first record.

The complete compilation, obtained through a computer program written specifically for this purpose, follows in Section II of this report. Because the compilation is stored on the LBL computer system, it may be accessed and manipulated by users via a computer terminal. With special arrangements a user may connect to the LBL computer terminal. This connection also allows the user to search selectively for specific key subjects, and to print only those records of interest.

A more complicated operation using compilation through computer access involves the manipulation of the data in user-written programs. This could be done, for example, using the data as input for a program modeling thermodynamic equilibria of a geothermal system. Programs could also be written to make statistical comparisons of various parameters stored in the compilation.

2. Bibliography

The bibliography given in Section III is a listing of all the sources from which data were collected for the compilation. The bibliography, like the geothermal fluid data compilation, was input to the BDMS computer to facilitate editing and retrieval on specified subjects. The format used is the same as that used by the National Geothermal Information Resource Group (GRID) at LBL.\textsuperscript{2,4} The descriptors for each reference are key words, taken from a standard thesaurus,\textsuperscript{5} which describe the subject.
matter discussed in the report or article. These key words facilitate computer searches for specific subjects.

The name and number in the upper right section of each bibliographic listing is made up of the principal author's last name and the year the article was published. This entry corresponds to that listed as the source of data at the end of each record in the fluid data compilation.

The bibliography contains listings of some reports and articles that were not used as sources in the compilation. They were scanned for data, however, and are included in the bibliography because they may be useful to investigators.

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COMPILATION OF GEOTHERMAL FLUID DATA
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<td>OTHER NOTES</td>
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<td>SEE CODE NAME = BAC 310 FOR FLUID PHASE ANALYSIS.</td>
<td>SEE CODE NAME = BAC 310 FOR FLUID PHASE ANALYSIS.</td>
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RECORD 6  
CODE NAME-PACA II  
SAMPLE TYPE=NONE

WELL-PACA II  
PACE LOCATION NO. 2  
SANDELL FARM  
SANDY VALLEY Cnty., N.M., USA

PHYSICAL DATA  
SP 5850  
SP CONDUCTIVITY 330EC  
RES P 3050  
GAS 1580  
RH 15  
COND 1  
S 0.2  

GASES IN STEAM PHASE ONLY.

BIBLIOGRAPHIC DATA  
SOURCES-  
TENY TH  

OTHER NOTES  
SEE CODE NAME = PACA II FOR ENUCILEABLE GAS ANALYSIS.
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<tr>
<td>WELL #47</td>
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<tr>
<td>B.C.A., MEXICO</td>
<td></td>
</tr>
<tr>
<td>SAMPLING INFORMATION</td>
<td></td>
</tr>
<tr>
<td>DATE= 10 MAR 75</td>
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<tr>
<td>SAMPLE NUMBER= LABORATORY= CALIFORNIA DEPARTMENT OF WATER RESOURCES</td>
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<tr>
<td>CONDITION OF SAMPLE= SAMPLE TEMP. = 197 C.</td>
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<tr>
<td>PPM= 660</td>
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<tr>
<td>TOT DISS SEDIMENT= 1804.00 PPM, RESIDUE ON EVAPORATION.</td>
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<td>UNITS= PPM</td>
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<td>ENUM</td>
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<td>SO4</td>
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</tr>
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<td>BIBLIOGRAPHIC DATA</td>
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<tr>
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<tr>
<td>SAMPLING INFORMATION</td>
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<td>SAMPLE NUMBER= LABORATORY= CALIFORNIA DEPARTMENT OF WATER RESOURCES</td>
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<td>CONDITION OF SAMPLE= SAMPLE TEMP. = 197 C.</td>
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<td>PHYSICAL DATA</td>
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<tr>
<td>PPM= 660</td>
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<tr>
<td>TOT DISS SEDIMENT= 1722.00 PPM, RESIDUE ON EVAPORATION.</td>
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<td>SAMPLING INFORMATION</td>
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<td>CONDITION OF SAMPLE= SAMPLE TEMP. = 209 C.</td>
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<td>PHYSICAL DATA</td>
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<tr>
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<td>TOT DISS SEDIMENT= 2542.00 PPM, RESIDUE ON EVAPORATION.</td>
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<td>SOURCES= COM 70</td>
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| CONCENTRATIONS NOT CORRECTED FOR STEAM LOSS. |
| BIBLIOGRAPHIC DATA |                        |
| SOURCES= COM 70 |                        |
WELL M-5
CENTRAL MEXICO

BELL DATA
PHYSICAL DATA
PHM 6.2

WELL DATA
TEMPERATURE 1860 C AT BIECH MILE AVERAGE PRODUCTION RATE 0.98 GPM AVERAGE PRODUCTION DEPTH 5100 AFE.

SAMPLING INFORMATION
SAMPLE HAVING 1987 PERCENT USES

PHYSICAL DATA
PHM 6.2

WELL DATA
MINERAL CONCENTRATION:

PHYSICAL DATA
PHM 6.2

WELL DATA
MINERAL CONCENTRATION:

PHYSICAL DATA
PHM 6.2

WELL DATA
MINERAL CONCENTRATION:

PHYSICAL DATA
PHM 6.2

BIBLIOGRAPHIC DATA
SOURCES:
READ 19
## RECORD 43
### CODE NAME = MV-96
### SAMPLE TYPE = WATER

### WELL INFO
- **CODE**: MV-96
- **FIELD**: El Pinacate Geothermal Field
- **STATE**: Baja, Mexico

### SAMPING INFORMATION
- **DATE:** 08/25/85
- **LABORATORY:** California Geothermal Energy Commission, Cali,
- **SAMPLE DESCRIPTION:** Unfiltered, 200 ml

### BRINE DATA
- **CONCENTRATION**
  - **Name**: Na
  - **Value**: 3420
- **Units**: ppm

### BIBLIOGRAPHIC DATA
- **SOURCE**: AEM 84, SPE 16, 7D

## RECORD 44
### CODE NAME = MV-96
### SAMPLE TYPE = WATER

### WELL INFO
- **CODE**: MV-96
- **FIELD**: El Pinacate Geothermal Field
- **STATE**: Baja, Mexico

### SAMPING INFORMATION
- **DATE:** 08/25/85
- **LABORATORY:** California Geothermal Energy Commission, Cali,
- **SAMPLE DESCRIPTION:** Unfiltered, 200 ml

### BRINE DATA
- **CONCENTRATION**
  - **Name**: Na
  - **Value**: 3420
- **Units**: ppm

### BIBLIOGRAPHIC DATA
- **SOURCE**: AEM 84, SPE 16, 7D

---

## RECORD 45
### CODE NAME = MV-96
### SAMPLE TYPE = WATER

### WELL INFO
- **CODE**: MV-96
- **FIELD**: El Pinacate Geothermal Field
- **STATE**: Baja, Mexico

### SAMPING INFORMATION
- **DATE:** 08/25/85
- **LABORATORY:** California Geothermal Energy Commission, Cali,
- **SAMPLE DESCRIPTION:** Unfiltered, 200 ml

### BRINE DATA
- **CONCENTRATION**
  - **Name**: Na
  - **Value**: 3420
- **Units**: ppm

### BIBLIOGRAPHIC DATA
- **SOURCE**: AEM 84, SPE 16, 7D

---

## RECORD 46
### CODE NAME = MV-96
### SAMPLE TYPE = WATER

### WELL INFO
- **CODE**: MV-96
- **FIELD**: El Pinacate Geothermal Field
- **STATE**: Baja, Mexico

### SAMPING INFORMATION
- **DATE:** 08/25/85
- **LABORATORY:** California Geothermal Energy Commission, Cali,
- **SAMPLE DESCRIPTION:** Unfiltered, 200 ml

### BRINE DATA
- **CONCENTRATION**
  - **Name**: Na
  - **Value**: 3420
- **Units**: ppm

### BIBLIOGRAPHIC DATA
- **SOURCE**: AEM 84, SPE 16, 7D

---

## RECORD 47
### CODE NAME = MV-96
### SAMPLE TYPE = WATER

### WELL INFO
- **CODE**: MV-96
- **FIELD**: El Pinacate Geothermal Field
- **STATE**: Baja, Mexico

### SAMPING INFORMATION
- **DATE:** 08/25/85
- **LABORATORY:** California Geothermal Energy Commission, Cali,
- **SAMPLE DESCRIPTION:** Unfiltered, 200 ml

### BRINE DATA
- **CONCENTRATION**
  - **Name**: Na
  - **Value**: 3420
- **Units**: ppm

### BIBLIOGRAPHIC DATA
- **SOURCE**: AEM 84, SPE 16, 7D

---

## RECORD 48
### CODE NAME = MV-96
### SAMPLE TYPE = WATER

### WELL INFO
- **CODE**: MV-96
- **FIELD**: El Pinacate Geothermal Field
- **STATE**: Baja, Mexico

### SAMPING INFORMATION
- **DATE:** 08/25/85
- **LABORATORY:** California Geothermal Energy Commission, Cali,
- **SAMPLE DESCRIPTION:** Unfiltered, 200 ml

### BRINE DATA
- **CONCENTRATION**
  - **Name**: Na
  - **Value**: 3420
- **Units**: ppm

### BIBLIOGRAPHIC DATA
- **SOURCE**: AEM 84, SPE 16, 7D

---

## RECORD 49
### CODE NAME = MV-96
### SAMPLE TYPE = WATER

### WELL INFO
- **CODE**: MV-96
- **FIELD**: El Pinacate Geothermal Field
- **STATE**: Baja, Mexico

### SAMPING INFORMATION
- **DATE:** 08/25/85
- **LABORATORY:** California Geothermal Energy Commission, Cali,
- **SAMPLE DESCRIPTION:** Unfiltered, 200 ml

### BRINE DATA
- **CONCENTRATION**
  - **Name**: Na
  - **Value**: 3420
- **Units**: ppm

### BIBLIOGRAPHIC DATA
- **SOURCE**: AEM 84, SPE 16, 7D
RECORD 49
CODE NAME=MO-28
SAMPLE TYPE=WATER
WELL M-28
CEPNIO GEOTHERMAL FIELD
B.C.= MEXICO
WELL DATA
TEMPERATURE 229 C AT BOTTOM NGLS, AVERAGE PRODUCTION INTERVAL-- AVERAGE PRODUCTION DEPTH = 1877M.
SAMPLING INFORMATION
SAMPLE LOCATION= LABORATORY-- USGS
PHYSICAL DATA
pH 8.52
ALKALI 4770
Ca 260
Mg 189
FL 293
K 25
Na 430
CO2 823
Mg 200
B 2
CONCENTRATIONS CORRECTED FOR STEAM LOSS
BIBLIOGRAPHIC DATA
SOURCE= REED 75

RECORD 50
CODE NAME=MO-38
SAMPLE TYPE=WATER
WELL M-38
CEPNIO GEOTHERMAL FIELD
B.C.= MEXICO
WELL DATA
TEMPERATURE 166 C AT SEPARATION
FLOW INFORMATION: WELL PRODUCING 150000 KG/MON WATER AND STEAM AT WELLHEAD PRESSURE = 3.47 BAR.
SAMPLING INFORMATION
DATE 12/14/81
LABORATORY= USGS
SAMPLE LOCATION= LABORATORY
STORAGE= ATTEMPT TO KEEP STEAM FLOWING, PREVENTING LIQUID SAMPLE FROM DEPOSING STEAM FLOWING FOR POWER FLOW READING.
PHYSICAL DATA
pH 8.00
ENTHALPY = 25° CAL/G
BIBLIOGRAPHIC DATA
SOURCE= REED 78

RECORD 51
CODE NAME=MO-12
SAMPLE TYPE=WATER
WELL M-12
CEPNIO GEOTHERMAL FIELD
B.C.= MEXICO
SAMPLING INFORMATION
DATE 11/2/75
CONDITION OF WELL DURING SAMPLING- WELLHEAD PRESSURE = 160 PSI.
WELL DATA
pH 8.80
BIBLIOGRAPHIC DATA
SOURCE= REED 75

RECORD 52
CODE NAME=MO-40
SAMPLE TYPE=WATER
WELL M-40
CEPNIO GEOTHERMAL FIELD
B.C.= MEXICO
WELL DATA
pH 8.60
FLOW INFORMATION= WELLHEAD PRESSURE = 162 PSI.
SAMPLING INFORMATION
NC SAMPLING, CR ANALYSIS METHODS GIVEN.
PHYSICAL DATA
BIBLIOGRAPHIC DATA
SOURCE= REED 70
**Record 53**

**Well M-10**
**CEREC PSRTE GEOTHERMAL FIELD**
**SAMPLE PERIOD**

**Sampling Information**
- **Date**: 24 Apr 87
- **Sample Name**: Sample obtained by bleeding well through a nipple.

**Brine Data**
- **Units**: ppm
- **Constituent**
  - **Ca**: 467
  - **Mg**: 100
  - **Na**: 20
  - **K**: 2

**Biographical Data**
- **Source**: MEXICO 79

---

**Record 55**

**Well M-10**
**CEREC PSRTE GEOTHERMAL FIELD**
**SAMPLE PERIOD**

**Sampling Information**
- **Date**: 24 Apr 87
- **Sample Name**: Laboratory—California Department of Water Resources.

**Brine Data**
- **Units**: ppm
- **Constituent**
  - **Na**: 360
  - **Ca**: 240
  - **Mg**: 64
  - **K**: 1

**Biographical Data**
- **Source**: CDE 79
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<th>COMMENT</th>
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**BIBLIOGRAPHIC DATA**

**SOURCES:**
- GeoRef

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**RECORD 58**

**CODE NAME:** DF-10
**WELL NAME:** DF-10
**PROJECT:** GEOTHERMAL FIELD
**SOURCE:** MEXICO
**SAMPLE NUMBER:** CALIFORNIA DEPARTMENT OF WATER RESOURCES
**SAMPLE LOCATION:** SEPARKO, CA
**SAMPLE LABEL:** CALIFORNIA DEPARTMENT OF WATER RESOURCES

**DATA:**

**CONCENTRATION:**
- Li: 15 ppm
- Na: 4500 ppm
- K: 125 ppm
- Ca: 4000 ppm
- Mg: 400 ppm
- Si: 4000 ppm
- Fe: 420 ppm
- Al: 4000 ppm
- Cl: 4000 ppm
- SO4: 2000 ppm
- HCO3: 1700 ppm
- NH3: 0 ppm

**COMMENT:**

**BIBLIOGRAPHIC DATA**

**SOURCES:**
- GeoRef
### Record 12
**Code Name:***-12C**
**Sample Type:***-Water

**Well:** N-12
**Field:** CREC PINTO GEOTHERMAL FIELD
**State:** NEW MEXICO

**Well Data:**
- Temperature: 214°F at Bottom Hole, Average Production Interval—Average Production Depth = 2300 ft.

**Sampling Information:**
- Sample Number: LACRABAL—USES

**Physical Data:**
- PPM: 5.4
- Comment: PH CALCULATED

**Drill Data:**
- Method of Analysis: Calculated Average Fluid Composition
- Units: mC

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Concentrations not corrected for steam loss.

**Bibliographic Data:**
- Source:

---

### Record 69
**Code Name:***-12E**
**Sample Type:***-Water

**Well:** N-12
**Field:** CREC PINTO GEOTHERMAL FIELD
**State:** NEW MEXICO

**Sampling Information:**
- Date: 21 SEP 85
- Conditions of Well During Sampling—Wellhead Pressure = 245 PSIG

**Drill Data:**
- Units: ppm

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**Bibliographic Data:**
- Source:

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| RECORD 46 |
| CODE NAME=136 |
| SAMPLE TYPE=WATER |

| WELL M-13 |
| CAUCAL PRATO GEOTHERMAL FIELD |
| B.C., MEXICO |

**Sampling Information**
- Date: 20 SEP 70
- Condition of well during sampling: Wellhead pressure = 140 psi.

| BRINE DATA |
| UNITS: ppm |
| CONCENTRATION | TREATMENT | COMMENT |
| Se | 860 |
| Na | 8770 |
| K | 2200 |
| Ca | 664 |
| Mg | 108 |
| Si | 527 |
| CO3 | 11 |

**Bibliographic Data**
- SOURCES: MERI / 70

---

| RECORD 47 |
| CODE NAME=136 |
| SAMPLE TYPE=WATER |

| WELL M-14 |
| CAUCAL PRATO GEOTHERMAL FIELD |
| B.C., MEXICO |

**Sampling Information**
- Date: 22 SEP 70
- Condition of well during sampling: Wellhead pressure = 70 psi.

**Physical Data**
- PPH: 0.00

| BRINE DATA |
| UNITS: ppm |
| CONCENTRATION | TREATMENT | COMMENT |
| Se | 860 |
| Na | 8770 |
| K | 2200 |
| Ca | 664 |
| Mg | 108 |
| Si | 527 |
| CO3 | 11 |

**Bibliographic Data**
- SOURCES: MERI / 70
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**WELL M-135A**

**El Viztepe Geothermal Field**

**Sample Information**

- **Sample Method:** Sample obtained by bleeding well through a small line.
- **Condition of well during sampling:** Wellhead pressure = 3.5 PSI.

**Drill Data**

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**Bibliographic Data**

**Source:** PERAC '75

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**WELL M-155A**

**El Viztepe Geothermal Field**

**Sample Information**

- **Sample Method:** Sample obtained by bleeding well through a small line.
- **Condition of well during sampling:** Wellhead pressure = 3.5 PSI.

**Drill Data**

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**Bibliographic Data**

**Source:** PERAC '75
**RECORD 73**

**CEOR NAME:** 6E6A

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**WELL INFORMATION**

- **Well Name:** 6E6A
- **Geologic Field:** PERICO
- **Location:** MEXICO

**WELL INFORMATION**

- **Owner:** COMISION FEDERAL DE ELECTRICIDAD

**SAMPLE INFORMATION**

- **Sample Number:** 6E6A
- **Lab:** CHEMISTRY LAB, CEREC PRETEC
- **Sample Location:** SALT PAN
- **Sample Description:** BEFORE STEAM FLUSHED

**PHYSICAL DATA**

- **Test DDS TDS:** 27397.00 PPM

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**REAGENT DATA**

- **Units:** PPM

**CONCENTRATION DATA**

- **Calculation:** Not yet determined

**BIBLIOGRAPHIC DATA**

- **SOURCES:**
  - DATA FROM A. ARACEN M.A., CEREC PRETEC, MEXICO, M/W 4/9/87

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**RECORD 74**

**CEOR NAME:** 6E6A

**SAMPLE TYPE/TREATMENT**

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**WELL INFORMATION**

- **Well Name:** 6E6A
- **Geologic Field:** PERICO
- **Location:** MEXICO

**WELL INFORMATION**

- **Owner:** COMISION FEDERAL DE ELECTRICIDAD

**SAMPLE INFORMATION**

- **Sample Number:** 6E6A
- **Lab:** CHEMISTRY LAB, CEREC PRETEC
- **Sample Location:** SALT PAN
- **Sample Description:** BEFORE STEAM FLUSHED

**PHYSICAL DATA**

- **Test DDS TDS:** 27397.00 PPM

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**REAGENT DATA**

- **Units:** PPM

**CONCENTRATION DATA**

- **Calculation:** Not yet determined

**BIBLIOGRAPHIC DATA**

- **SOURCES:**
  - DATA FROM A. ARACEN M.A., CEREC PRETEC, MEXICO, M/W 4/9/87

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**RECORD 75**

**CEOR NAME:** 6E6A

**SAMPLE TYPE/TREATMENT**

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**WELL INFORMATION**

- **Well Name:** 6E6A
- **Geologic Field:** PERICO
- **Location:** MEXICO

**WELL INFORMATION**

- **Owner:** COMISION FEDERAL DE ELECTRICIDAD

**SAMPLE INFORMATION**

- **Sample Number:** 6E6A
- **Lab:** CHEMISTRY LAB, CEREC PRETEC
- **Sample Location:** SALT PAN
- **Sample Description:** BEFORE STEAM FLUSHED

**PHYSICAL DATA**

- **Test DDS TDS:** 27397.00 PPM

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**REAGENT DATA**

- **Units:** PPM

**CONCENTRATION DATA**

- **Calculation:** Not yet determined

**BIBLIOGRAPHIC DATA**

- **SOURCES:**
  - DATA FROM A. ARACEN M.A., CEREC PRETEC, MEXICO, M/W 4/9/87

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**RECORD 75**

**CEOR NAME:** 6E6A

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**WELL INFORMATION**

- **Well Name:** 6E6A
- **Geologic Field:** PERICO
- **Location:** MEXICO

**WELL INFORMATION**

- **Owner:** COMISION FEDERAL DE ELECTRICIDAD

**SAMPLE INFORMATION**

- **Sample Number:** 6E6A
- **Lab:** CHEMISTRY LAB, CEREC PRETEC
- **Sample Location:** SALT PAN
- **Sample Description:** BEFORE STEAM FLUSHED

**PHYSICAL DATA**

- **Test DDS TDS:** 27397.00 PPM

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**REAGENT DATA**

- **Units:** PPM

**CONCENTRATION DATA**

- **Calculation:** Not yet determined

**BIBLIOGRAPHIC DATA**

- **SOURCES:**
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**SAMPLE TYPE/TREATMENT**

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**REAGENT DATA**

- **Units:** PPM

**CONCENTRATION DATA**

- **Calculation:** Not yet determined

**BIBLIOGRAPHIC DATA**

- **SOURCES:**
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**CEOR NAME:** 6E6A

**SAMPLE TYPE/TREATMENT**

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**WELL INFORMATION**

- **Well Name:** 6E6A
- **Geologic Field:** PERICO
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**WELL INFORMATION**

- **Owner:** COMISION FEDERAL DE ELECTRICIDAD

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- **Sample Location:** SALT PAN
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**REAGENT DATA**

- **Units:** PPM

**CONCENTRATION DATA**

- **Calculation:** Not yet determined

**BIBLIOGRAPHIC DATA**

- **SOURCES:**
  - DATA FROM A. ARACEN M.A., CEREC PRETEC, MEXICO, M/W 4/9/87

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**RECORD 75**

**CEOR NAME:** 6E6A

**SAMPLE TYPE/TREATMENT**

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**WELL INFORMATION**

- **Well Name:** 6E6A
- **Geologic Field:** PERICO
- **Location:** MEXICO

**WELL INFORMATION**

- **Owner:** COMISION FEDERAL DE ELECTRICIDAD

**SAMPLE INFORMATION**

- **Sample Number:** 6E6A
- **Lab:** CHEMISTRY LAB, CEREC PRETEC
- **Sample Location:** SALT PAN
- **Sample Description:** BEFORE STEAM FLUSHED

**PHYSICAL DATA**

- **Test DDS TDS:** 27397.00 PPM

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**REAGENT DATA**

- **Units:** PPM

**CONCENTRATION DATA**

- **Calculation:** Not yet determined

**BIBLIOGRAPHIC DATA**

- **SOURCES:**
  - DATA FROM A. ARACEN M.A., CEREC PRETEC, MEXICO, M/W 4/9/87
### Record 79

**Well** M-30
**Location** Central Plateau Geothermal Field
**Bakersfield, California**

- **Date of Sampling:** January 24, 1974
- **Depth of Well During Sampling:** 1,385 meters
- **Flow Rate:** Maximum flow rate = 800 tons per hour; 470 tons, at 228 psi
- **Production Interval:** Casing slotted from 160 to 1565 m

#### Sample Data

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#### Concentrations Not Corrected for Steam Loss

#### Bibliographic Data

- **Source:** Read 75

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### Record 80

**Well** M-30
**Location** Central Plateau Geothermal Field
**Bakersfield, California**

- **Date of Sampling:** January 24, 1974
- **Depth of Well During Sampling:** 1,385 meters
- **Flow Rate:** Maximum flow rate = 800 tons per hour; 470 tons, at 228 psi
- **Production Interval:** Casing slotted from 160 to 1565 m

#### Sample Data

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#### Concentrations Not Corrected for Steam Loss

#### Bibliographic Data

- **Source:** Read 75

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**Other Notes:**
- Well developed over a period of 6 months by slowly increasing steam to full capacity. Details provided in published articles. Other analyses made during well development. Other analyses not compiled here.
**RECORD 01**
COD: M-21A
SAMPLE TYPE: WATER

**WELL INFORMATION**
ELEV. PREDICT. GEOTHERMAL FIELD
RI:
MEXICO

**SAMPLING INFORMATION**
DATE: 10 SEP 71
SAMPLE TYPE: SAMPLE OBTAINED BY DRILLING WELLS THROUGH A CONDITION OF WELL DURING SAMPLING—HELMET PRESSURE = 650 PSIG.

**CHEMICAL DATA**

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**BIBLIOGRAPHIC DATA**
SOURCES:
NEADEC 75

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**RECORD 02**
COD: M-21A
SAMPLE TYPE: WATER

**WELL INFORMATION**
ELEV. PREDICT. GEOTHERMAL FIELD
RI:
MEXICO

**SAMPLING INFORMATION**
DATE: 10 SEP 71
SAMPLE TYPE: WATER—SAMPLE OBTAINED BY DRILLING WELLS THROUGH A CONDITION OF WELL DURING SAMPLING—HELMET PRESSURE = 900 PSIG.

**CHEMICAL DATA**

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**BIBLIOGRAPHIC DATA**
SOURCES:
NEADEC 75

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**RECORD 03**
COD: M-21A
SAMPLE TYPE: WATER

**WELL INFORMATION**
ELEV. PREDICT. GEOTHERMAL FIELD
RI:
MEXICO

**SAMPLING INFORMATION**
DATE: 10 SEP 71
SAMPLE TYPE: WATER—SAMPLE OBTAINED BY DRILLING WELLS THROUGH A CONDITION OF WELL DURING SAMPLING—HELMET PRESSURE = 900 PSIG.

**CHEMICAL DATA**

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**BIBLIOGRAPHIC DATA**
SOURCES:
NEADEC 75
**Record 03**  
**Code Name:** H-26  
**Sample Type:** Water

**Well Data**  
**Field:** Cerro Prieto Geothermal Field  
**Country:** Mexico

**Temperature:** 293°C at 6,187.4 ft.  
**Producing Depth:** 1,748 ft.  
**Sampling Information:**  
- **Sample Number:** 1029  
- **Temperature:** 23°C at 6,187.4 ft.  
- **Depth:** 1,748 ft.  
- **Wellhead Pressure:** 1,251 psig.  
- **Condition of Well During Sampling:** Well inactive.

**Brine Data**  
**Units:** ppm  
**Concentrations:**  
- **SiO₂:** 380  
- **Ca:** 475  
- **Mg:** 560  
- **Na:** 520  
- **K:** 210  
- **Sr:** 30  
- **Ba:** 100  
- **Mn:** 50  
- **Cd:** 2  
- **Zn:** 10

**Concentrations Corrected for Steam Loss.**

**Bibliographic Data**  
**Source:** REO 73

---

**Record 49**  
**Code Name:** H-28  
**Sample Type:** Water

**Well Data**  
**Field:** Cerro Prieto Geothermal Field  
**Country:** Mexico

**Temperature:** 293°C at 6,187.4 ft.  
**Producing Depth:** 1,748 ft.  
**Sampling Information:**  
- **Sample Number:** 1029  
- **Temperature:** 23°C at 6,187.4 ft.  
- **Depth:** 1,748 ft.  
- **Wellhead Pressure:** 1,251 psig.  
- **Condition of Well During Sampling:** Well inactive.

**Brine Data**  
**Units:** ppm  
**Concentrations:**  
- **SiO₂:** 380  
- **Ca:** 475  
- **Mg:** 560  
- **Na:** 520  
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- **Sr:** 30  
- **Ba:** 100  
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- **Cd:** 2  
- **Zn:** 10

**Concentrations Corrected for Steam Loss.**

**Bibliographic Data**  
**Source:** REO 73

---

**Record 46**  
**Code Name:** H-26  
**Sample Type:** Water

**Well Data**  
**Field:** Cerro Prieto Geothermal Field  
**Country:** Mexico

**Temperature:** 293°C at 6,187.4 ft.  
**Producing Depth:** 1,748 ft.  
**Sampling Information:**  
- **Sample Number:** 1029  
- **Temperature:** 23°C at 6,187.4 ft.  
- **Depth:** 1,748 ft.  
- **Wellhead Pressure:** 1,251 psig.  
- **Condition of Well During Sampling:** Well inactive.

**Brine Data**  
**Units:** ppm  
**Concentrations:**  
- **SiO₂:** 380  
- **Ca:** 475  
- **Mg:** 560  
- **Na:** 520  
- **K:** 210  
- **Sr:** 30  
- **Ba:** 100  
- **Mn:** 50  
- **Cd:** 2  
- **Zn:** 10

**Concentrations Corrected for Steam Loss.**

**Bibliographic Data**  
**Source:** REO 73

---

**Record 44**  
**Code Name:** H-26  
**Sample Type:** Water

**Well Data**  
**Field:** Cerro Prieto Geothermal Field  
**Country:** Mexico

**Temperature:** 293°C at 6,187.4 ft.  
**Producing Depth:** 1,748 ft.  
**Sampling Information:**  
- **Sample Number:** 1029  
- **Temperature:** 23°C at 6,187.4 ft.  
- **Depth:** 1,748 ft.  
- **Wellhead Pressure:** 1,251 psig.  
- **Condition of Well During Sampling:** Well inactive.

**Brine Data**  
**Units:** ppm  
**Concentrations:**  
- **SiO₂:** 380  
- **Ca:** 475  
- **Mg:** 560  
- **Na:** 520  
- **K:** 210  
- **Sr:** 30  
- **Ba:** 100  
- **Mn:** 50  
- **Cd:** 2  
- **Zn:** 10

**Concentrations Corrected for Steam Loss.**

**Bibliographic Data**  
**Source:** REO 73

---
RECORD 97
CODE NAME-970
SAMPLE TYPE-WATER

WELL M-27
CEDRO PASTE GEOHERMAL FIELD
R.B., MEXICO

WELL INFORMATION:
OWNER- COMISION FEDERAL DE ELECTRICIDAD
SAMPLING INFORMATION:
SAMPLE NUMBER, LOCATION- CPE CHEMISTRY LAB, CEDRO PASTE.
SAMPLE LOCATION- SEPARATE
CONDITION OF SAMPLE- BEING AFTER STEAM FLASHED.

PHYSICAL DATA:
TO DISS SOLIDS= 1877.00 ppm, SUN

B 550
C 152
SUL

CONCENTRATIONS NOT CORRECTED FOR STEAM LOSS.

BIBLIOGRAPHIC DATA:
SOURCES- NA
DATA FROM A. MANSON, CPE, CEDRO PASTE, MEXICO. MEND 970/18/76.

RECORD 98
CODE NAME-970
SAMPLE TYPE-WATER

WELL M-27
CEDRO PASTE GEOHERMAL FIELD
R.B., MEXICO

WELL INFORMATION:
OWNER- COMISION FEDERAL DE ELECTRICIDAD
SAMPLING INFORMATION:
SAMPLE NUMBER, LOCATION- CPE CHEMISTRY LAB, CEDRO PASTE.
SAMPLE LOCATION- SEPARATE
CONDITION OF SAMPLE- BEING AFTER STEAM FLASHED.

PHYSICAL DATA:
TO DISS SOLIDS= 2109.00 ppm, SUN

B 146
C 621
SUL

CONCENTRATIONS NOT CORRECTED FOR STEAM LOSS.

BIBLIOGRAPHIC DATA:
SOURCES- NA
DATA FROM A. MANSON, CPE, CEDRO PASTE, MEXICO. MEND 970/18/76.
RECORD 101
CODE WATER+90
SAMPLE TYPE=H2O
WELL M-29
CESE PEITE GECHEL PH FIELD
P.T. MEXICO
WELL DATA
TEMPERATURE 21.5 C AT BRETCH MEX.
BRETCH PRESSURE=2100 PSIG.
SAMPLING INFORMATION
SAMPLE NUMBER= 1200距离= 1000 FEET.
PHYSICAL DATA
PH = 8.42
EC = 1000
DR = 1.27
EC = 1000
FLUIDS
SALT
H2O
CO2
N2
CONCENTRATIONS AS SPED FOR STEAM LOSS.
BIBLIOGRAPHIC DATA
SOURCES=
MEXICO 97

RECORD 102
CODE WATER+90
SAMPLE TYPE=H2O
WELL M-29
CESE PEITE GECHEL PH FIELD
P.T. MEXICO
WELL DATA
TEMPERATURE 19.4 C AT BRETCH MEX.
BRETCH PRESSURE=1000 PSIG.
SAMPLING INFORMATION
DATE= 8 DEC 80
SAMPLE NUMBER= 1250
SAMPLE LOCATION= 1000 FEET.
SAMPLING CONDITION= BRING WATER STEAM FLUSHED.
BRETCH PRESSURE= 200 PSIG.
PHYSICAL DATA
PH = 8.31
ENTROPY = 2.42 CAL/CF
DR = 1.27
EC = 1000
EC = 1000
FLOID
SALT
H2O
CO2
N2
CONCENTRATIONS AS SPED FOR STEAM LOSS.
BIBLIOGRAPHIC DATA
SOURCES=
MEXICO 97

RECORD 103
CODE WATER+90
SAMPLE TYPE=H2O
WELL M-29
CESE PEITE GECHEL PH FIELD
P.T. MEXICO
WELL DATA
TEMPERATURE 21.2 C AT BRETCH MEX.
BRETCH PRESSURE=2100 PSIG.
SAMPLING INFORMATION
DATE= 8 DEC 80
SAMPLE NUMBER= 1200
SAMPLE LOCATION= 1000 FEET.
SAMPLING CONDITION= BRING WATER STEAM FLUSHED.
PHYSICAL DATA
PH = 8.31
ENTROPY = 2.42 CAL/CF
DR = 1.27
EC = 1000
EC = 1000
FLOID
SALT
H2O
CO2
N2
CONCENTRATIONS AS SPED FOR STEAM LOSS.
BIBLIOGRAPHIC DATA
SOURCES=
MEXICO 97
RECORD 108  
CODE NAME : MEXICO  
SAMPLE TYPE : WATER

WELL H-90  
CERRO PARAISO GEOTHERMAL FIELD  
B.C., MEXICO

WELL INFORMATION  
OWNER : CONCEPCION FEDERAL DE ELECTRICIDAD

SAMPLING INFORMATION  
SAMPLE NUMBER : 860.  LABORATORY : CPU CHEMISTRY LAB, CERRO PARAISO.
SAMPLE LOCATION : SEPARATION   
EFFECTS OF SAMPLES - GAME AFTER STEAM FLUSHED.

PHYSICAL DATA  
TFT DISO SECONDS : 12490.00 PPM, ECM

DRNE DATA  
UNITs : PPM

CONCENTRATION : TRITICUM CEMENT

SiO2 : 9.0  
Na : 0.0094  
K : 0.0009  
CaO : 0.0009  
CO2 : 15688  
H2O : 144

DATA ARE MEAN VALUES OF CONCENTRATIONS DETERMINED USING THE FOLLOWING:
CONSISTENCE, SAMPLES, REDUCTIONS, RELATION, TEMPERATURE, AFTER STEAM FLUSHED.

BIBLIOGRAPHIC DATA  
SOURCES :  
MEXICO 76  
DATA FROM A. M. M. MEXICO, CERRO PARAISO, MEXICO.  
MEXICO 86/2/76.

RECORD 109  
CODE NAME : MEXICO  
SAMPLE TYPE : WATER

WELL H-90  
CERRO PARAISO GEOTHERMAL FIELD  
B.C., MEXICO

WELL INFORMATION  
OWNER : CONCEPCION FEDERAL DE ELECTRICIDAD

SAMPLING INFORMATION  
SAMPLE NUMBER : 860.  LABORATORY : CPU CHEMISTRY LAB, CERRO PARAISO.
SAMPLE LOCATION : SEPARATION   
EFFECTS OF SAMPLES - GAME AFTER STEAM FLUSHED.

PHYSICAL DATA  
TFT DISO SECONDS : 12490.00 PPM

DRNE DATA  
UNITs : PPM

CONCENTRATION : TRITICUM CEMENT

SiO2 : 10.979  
Na : 0.0094  
K : 0.0009  
CaO : 0.0009  
CO2 : 15688  
H2O : 144

DATA ARE MEAN VALUES OF CONCENTRATIONS DETERMINED USING THE FOLLOWING:
CONSISTENCE, SAMPLES, REDUCTIONS, RELATION, TEMPERATURE, AFTER STEAM FLUSHED.

BIBLIOGRAPHIC DATA  
SOURCES :  
MEXICO 76  
DATA FROM A. M. M. MEXICO, CERRO PARAISO, MEXICO.  
MEXICO 86/2/76.
### Record 110
**WELL NO.**: 10  
**CORED, PRODUCING, GEOTHERMAL FIELD**: B.C.A. MEXICO  
**SAMPLE INFORMATION**:  
**DATE**: 4/11/74  
**CONDITION OF WELL DURING SAMPLING**: WELLHEAD PRESSURE = 11.55 PSIG  
**BRAINE DATA**:  
**UNITS**: PPM  
**CONCENTRATION**:  
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<tr>
<td>MgO</td>
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<td>Fe₂O₃</td>
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<td>Na₂O</td>
<td>588 ppm</td>
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<td>K₂O</td>
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<td>H₂O</td>
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**BIBLIOGRAPHIC DATA**  
**SOURCE**: SOURCE TQ  
**ARGUAY R. MANN W., C.P.E., CERO PRIETO, MEXICO.**  
**MEMO**: 5/3/74.

### Record 111
**WELL NO.**: 11  
**CORED, PRODUCING, GEOTHERMAL FIELD**: B.C.A. MEXICO  
**SAMPLE INFORMATION**:  
**DATE**: 4/11/74  
**CONDITION OF WELL DURING SAMPLING**: WELLHEAD PRESSURE = 11.55 PSIG  
**BRAINE DATA**:  
**UNITS**: PPM  
**CONCENTRATION**:  
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**BIBLIOGRAPHIC DATA**  
**SOURCE**: SOURCE TQ  
**ARGUAY R. MANN W., C.P.E., CERO PRIETO, MEXICO.**  
**MEMO**: 5/3/74.

### Record 112
**WELL NO.**: 11  
**CORED, PRODUCING, GEOTHERMAL FIELD**: B.C.A. MEXICO  
**SAMPLE INFORMATION**:  
**DATE**: 4/11/74  
**CONDITION OF WELL DURING SAMPLING**: WELLHEAD PRESSURE = 11.55 PSIG  
**BRAINE DATA**:  
**UNITS**: PPM  
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**CONCENTRATIONS NOT CORRECTED FOR STEAM LOSS.**  
**BIBLIOGRAPHIC DATA**  
**SOURCE**: SOURCE TQ  
**ARGUAY R. MANN W., C.P.E., CERO PRIETO, MEXICO.**  
**MEMO**: 5/3/74.
### Record 115
**CODE NAME:** 116115
**SAMPLE TYPE:** WATER

#### WELL DATA
- **WELL:** 116115
- **Well Name:** 116115
- **Sample Type:** WATER

#### Sample Information
- **Date:** 26 FEB 76
- **Sample Number:** 116115
- **Sample Location:** UCSD

#### Physical Data
- **Temp during reading:** 25°C
- **Sample Type:** WATER

#### Concentrations
- **Units:** mg/L
- **Concentrations:**
  - **SiO₂:** 2900 mg/L
  - **Ca:** 680 mg/L
  - **Mg:** 685 mg/L
  - **Na:** 2900 mg/L
  - **K:** 15400 mg/L
  - **HCO₃:** 61 mg/L

#### Bibliographic Data
- **Source:** Sanford & LeRoy, 1975

---

### Record 116
**CODE NAME:** 116116
**SAMPLE TYPE:** WATER

#### WELL DATA
- **WELL:** 116116
- **Well Name:** 116116
- **Sample Type:** WATER

#### Sample Information
- **Date:** 1 AUG 76
- **Sample Number:** 116116
- **Sample Location:** UCSD

#### Physical Data
- **pH:** 8.96
- **Conductance:** 27400 µmhos/cm

### Bibliographic Data
- **Source:** Sanford & LeRoy, 1975

---

### Record 117
**CODE NAME:** 116117
**SAMPLE TYPE:** WATER

#### WELL DATA
- **WELL:** 116117
- **Well Name:** 116117
- **Sample Type:** WATER

#### Sample Information
- **Date:** 15 DEC 76
- **Sample Number:** 116117
- **Sample Location:** UCSD

#### Physical Data
- **pH:** 8.96
- **Conductance:** 27400 µmhos/cm

---

### Average Analysis
- **SiO₂:** 2900 mg/L
- **Ca:** 680 mg/L
- **Mg:** 685 mg/L
- **Na:** 2900 mg/L
- **K:** 15400 mg/L
- **HCO₃:** 61 mg/L

---

### Bibliographic Data
- **Source:** Sanford & LeRoy, 1975
**RECORD 118**
**CODE NAME=#456**
**SAMPLE TYPE=H2O**

**WELL N/A**
**SECRET LATITUDE: 31.6**
**SECRET LONGITUDE: -115.6**
**FIELD: SOUTHERN U.S.**

**SAMPLE INFORMATION**
- **DATE:** 1/10/84
- **SAMPLE LOCATION:** 1202 FT
- **SAMPLE TYPE:** GAS
- **TREATMENT:** FLUSHED WITH 1500 GALLONS OF WATER AND STEAM AT 1200 PSIG

**PHYSICAL DATA**
- **PPM:** 600
- **EC:** 1500
- **EC:** 750
- **EC:** 200
- **EC:** 100
- **EC:** 10
- **EC:** 2

**BIBLIOGRAPHIC DATA**
**SOURCE:**

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**RECORD 120**
**CODE NAME=#146**
**SAMPLE TYPE=H2O**

**WELL N/A**
**SECRET LATITUDE: 31.6**
**SECRET LONGITUDE: -115.6**
**FIELD: SOUTHERN U.S.**

**SAMPLE INFORMATION**
- **DATE:** 1/10/84
- **SAMPLE LOCATION:** 1202 FT
- **SAMPLE TYPE:** GAS
- **TREATMENT:** FLUSHED WITH 1500 GALLONS OF WATER AND STEAM AT 1200 PSIG

**PHYSICAL DATA**
- **PPM:** 600
- **EC:** 1500
- **EC:** 750
- **EC:** 200
- **EC:** 100
- **EC:** 10
- **EC:** 2

**BIBLIOGRAPHIC DATA**
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**CONCENTRATIONS NOT CORRECTED FOR STEAM LOSS.**
RECORD 126
COE 12444-384
SAMPLE TYPE= \textit{water}

WELL M-39
CECRO PICTO GEOERTHERMAL FIELD
B.C., MEXICO

WELL DATA
FIELD INFORMATION -- WELLHEAD PRESSURE = 700 PSI.

SAMPLING INFORMATION
NO SAMPLING CAN ANALYSIS METHODS GIVEN.

PHYSICAL DATA
PPI 8.30

BRINE DATA
UNITS= PPM

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AVERAGE ANALYSES

BIBLIOGRAPHIC DATA

SOURCES -- MELIA 70

---

RECORD 127
COE 12485-384
SAMPLE TYPE= \textit{water}

WELL M-39
CECRO PICTO GEOERTHERMAL FIELD
B.C., MEXICO

WELL DATA
FIELD INFORMATION -- 80.3 IQR\% = 12 PERCENT STEAM, 80 PSI SEPARATE PRESSURE, 10 PSI WELLHEAD PRESSURE.

SAMPLING INFORMATION
DATE= 23 MAR 54
SAMPLE NUMBER, LABORATORY= NO. 124, CFE CHEMISTRY LAB, CECPRA PRETO
SAMPLE LOCATION= SEPARATE
SAMPLING TECHNIQUE= SEPARATE
SAMPLING TO SAMPLER, TANKS AFTER STEAM FLUSHED, TANKS AT 260° F. TEMP. = 180 C.
CONCENTRATION OF WELL DURING SAMPLING = WELL FLUSHING.

PHYSICAL DATA
PPI 8.30

BRINE DATA
UNITS= PPM

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AVERAGE ANALYSES

BIBLIOGRAPHIC DATA

SOURCES -- MELIA 70

---

RECORD 128
COE 12486-384
SAMPLE TYPE= \textit{water}

WELL M-39
CECRO PICTO GEOERTHERMAL FIELD
B.C., MEXICO

WELL DATA
FIELD INFORMATION -- 80.3 IQR\% = 12 PERCENT STEAM, 80 PSI SEPARATE PRESSURE, 10 PSI WELLHEAD PRESSURE.

SAMPLING INFORMATION
DATE= 26 MAR 54
SAMPLE NUMBER, LABORATORY= NO. 125, CFE CHEMISTRY LAB, CECPRA PRETO
SAMPLE LOCATION= SEPARATE
SAMPLING TECHNIQUE= SEPARATE
SAMPLING TO SAMPLER, TANKS AFTER STEAM FLUSHED, TANKS AT 260° F. TEMP. = 180 C.
CONCENTRATION OF WELL DURING SAMPLING = WELL FLUSHING.

PHYSICAL DATA
PPI 8.30

BRINE DATA
UNITS= PPM

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AVERAGE ANALYSES

BIBLIOGRAPHIC DATA

SOURCES -- MELIA 70

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RECORD 129
COE 12444-390
SAMPLE TYPE= \textit{water}

WELL M-39
CECRO PICTO GEOERTHERMAL FIELD
B.C., MEXICO

WELL DATA
FIELD INFORMATION -- 80.3 IQR\% = 12 PERCENT STEAM, 80 PSI SEPARATE PRESSURE, 10 PSI WELLHEAD PRESSURE.

SAMPLING INFORMATION
DATE= 26 MAR 54
SAMPLE NUMBER, LABORATORY= NO. 125, CFE CHEMISTRY LAB, CECPRA PRETO
SAMPLE LOCATION= SEPARATE
SAMPLING TECHNIQUE= SEPARATE
SAMPLING TO SAMPLER, TANKS AFTER STEAM FLUSHED, TANKS AT 260° F. TEMP. = 180 C.
CONCENTRATION OF WELL DURING SAMPLING = WELL FLUSHING.

PHYSICAL DATA
PPI 8.30

BRINE DATA
UNITS= PPM

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AVERAGE ANALYSES

BIBLIOGRAPHIC DATA

SOURCES -- MELIA 70
**RECORD 126**
CODE NAME=H-340
SAMPLE TYPE=Water

**WELL DATA**
**WELLS**
WELL H-39

**EQUIPMENT**
EQUIPMENT: GEOTHERMAL FIELD
N.B.: PRESS

**WELL DATA**
**TEMPERATURE**
162.7° C AT SEPARATED

**FLOW INFORMATION**
MEASURED 226000 GPM WATER AND STEAM AT WELLHEAD PRESSURE = 4500 PSI.

**SAMPLE INFORMATION**

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**ENTHALPHY**
204 CAL/G

**WELL DATA**
**UNIT**= ML

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**TEMP DURING READING**
25 C

**CONCENTRATIONS NOT CORRECTED FOR STEAM LOSS.**

**BIBLIOGRAPHIC DATA**

**RECEIVED 75**

---

**RECORD 130**
CODE NAME=H-395
SAMPLE TYPE=Water

**WELL DATA**
**WELLS**
WELL H-39

**EQUIPMENT**
EQUIPMENT: GEOTHERMAL FIELD
N.B.: PRESS

**WELL DATA**
**TEMPERATURE**
162.7° C AT SEPARATED

**FLOW INFORMATION**
MEASURED 226000 GPM WATER AND STEAM AT WELLHEAD PRESSURE = 4500 PSI.

**SAMPLE INFORMATION**

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**PHYSICAL DATA**

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**ENTHALPHY**
204 CAL/G

**WELL DATA**
**UNIT**= ML

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**TEMP DURING READING**
25 C

**CONCENTRATIONS NOT CORRECTED FOR STEAM LOSS.**

**BIBLIOGRAPHIC DATA**

**RECEIVED 75**
RECORD 127
EGG D E G E 3-14-163
S A M P L E T Y P E W A T E R

WELL MESA 4-20
EAST MESA VCA
LOCATION- T-34, R-37, S-9, 310.
DEEPWATER COUNTY, CAA, USA

WELL INFORMATION
LOCATION- WELL BORE OF RECLAMATION. DATE DRILLED- 30 APR 76 - 10 MAY 76.

WELL DATA
DEPTH- 465 METERS
TEMPERATURE- 170 C AT BOTTOM WELL.
PRESSURE- SIMPLIFIED- SLAGGED CASING BETWEEN 1225 AND 1230 FT. TOTAL
EMITTER- 1225.4 FT. WELL IS DESIGNATED AS AN INJECTION WELL. ALL
DEPTHS MEASURED FROM KELLY BUSHING, 51.2 FT ABOVE GROUND
SURFACE.

SAMPLING INFORMATION
DATE- 27 APR 76
SAMPLE LOCATION- D-330.40 USG.
SAMPLE NUMBER- D-330.40 SWIRL TEST NO. 2 FROM INTERVAL 1226 - 1227
SAMPLE NO. 31677 27TH STRAND.

PHYSICAL DATA
PCT DTS SELCED- 2398.00 USG.

BRENT DATA
UNIT- NGL

CONCENTRATION
CEMENT

H2O 330
CA 40.7
CO2 60.0
SC 663
MCC 717

BIBLIOGRAPHIC DATA
SCHELDE- USL 62
BENTH 64
MECKLAND 76

RECORD 136
EGG D E G E 3-14-163
S A M P L E T Y P E W A T E R

WELL MESA 4-20
EAST MESA VCA
LOCATION- T-34, R-37, S-9, 310.
DEEPWATER COUNTY, CAA, USA

WELL INFORMATION
LOCATION- WELL BORE OF RECLAMATION. DATE DRILLED- 27 JUN 72 - 10 AUG 72.

WELL DATA
DEPTH- 2456 METERS
TEMPERATURE- 286 C AT BOTTOM WELL.
PRESSURE- SIMPLIFIED- SLAGGED CASING BETWEEN 2425 AND 2430 FT. TOTAL
FLOW INFORMATION- SLAGGED CASING, TWO FIELD FLOW-1610
EMITTER- 2425 FT. TWO FIELD INHIBITS, 272 EMITTER STEAM, FOR FIELD TEST NO. 2. FIELD
EMITTER- 2425 FT. KELLY BUSHING, 272 EMITTER STEAM, FOR FIELD TEST NO. 2.

PRODUCTION INFORMATION- SLAGGED CASING BETWEEN 2425 AND 2432 FT.
TOTAL SLAGGED FLOW- 25 FT.
EMITTER- 2425 FT. WELL IS DESIGNATED AS AN INJECTION WELL. ALL DEPTHS MEASURED FROM KELLY
BUSHING, 41.7 FT ABOVE GROUND SURFACE.

SAMPLING INFORMATION
DATE- 23 JUN 72
SAMPLE LOCATION- D-330.40 USG.
SAMPLING CONDITIONS- D-330.40 SWIRL TEST NO. 2 FROM INTERVAL 2426 - 2427
SAMPLE NO. 31677 27TH STRAND.

PHYSICAL DATA
PCT DTS SELCED- 16720.00 USG.

BRENT DATA
UNIT- NGL

CONCENTRATION
CEMENT

H2O 272
BC 434
Ca 309
Mg 309
Sc 73
MCC 205

BIBLIOGRAPHIC DATA
SCHELDE- USL 62
BENTH 64
MECKLAND 76
EL 76
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<th>RECOR 140</th>
<th>CODE NAME: MEZA 8-16</th>
<th>SAMPLE TYPE: WATER</th>
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**WELL INFORMATION**
- OWNER: U.S. BUREAU OF RECLAMATION
- DATE DRILLED: 23 JUN 72 - 23 AUG 72
- DEPTH: 2946 FEET
- TEMPERATURE: 804 F
- FLOW INFORMATION: BICYCLE PUMPAGE, THROTTLE FLOW = 2000 GPM, 6000 LFH, 3000 GPM, 6000 LFH, 3000 GPM, 6000 LFH
- SPECIATION INTERVAL: SLICED CASING BETWEEN 2730 AND 2830 FT.
- CEMENT: Sample taken in well before additional sections of casing were perforated. All depths measured from Kelly bushing. 6.7 FT above ground surface.

**SAMPLING INFORMATION**
- DATE: 21 JUL 72

**PHYSICAL DATA**
- pH: 8.3
- CONDUCTIVITY: 500 µS/CM
- TEMPERATURE: 30°C

**METHOD OF ANALYSIS**
- Metals by ICP analysis.

**UNIT CONCENTRATIONS**

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>CONCENTRATION</th>
<th>COMMENTS</th>
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**CONCENTRATIONS NOT CORRECTED FOR STEAM LOSS, LOSS ESTIMATED TO BE 57 PERCENT.**

**BIBLIOGRAPHIC DATA**
- DATE: 76.

---

**RECOR 141 | CODE NAME: MEZA 8-10 | SAMPLE TYPE: WATER**

**WELL INFORMATION**
- OWNER: U.S. BUREAU OF RECLAMATION
- DATE DRILLED: 23 JUN 72 - 23 AUG 72
- DEPTH: 2946 FEET
- TEMPERATURE: 804 F
- FLOW INFORMATION: BICYCLE PUMPAGE, THROTTLE FLOW = 2000 GPM, 6000 LFH, 3000 GPM, 6000 LFH, 3000 GPM, 6000 LFH
- SPECIATION INTERVAL: SLICED CASING BETWEEN 2730 AND 2830 FT.
- CEMENT: Sample taken in well before additional sections of casing were perforated. All depths measured from Kelly bushing. 6.7 FT above ground surface.

**SAMPLING INFORMATION**
- DATE: 21 JUL 72

**PHYSICAL DATA**
- pH: 8.3
- CONDUCTIVITY: 500 µS/CM
- TEMPERATURE: 30°C

**METHOD OF ANALYSIS**
- Metals by ICP analysis.

**UNIT CONCENTRATIONS**

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<tr>
<th>ELEMENT</th>
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**CONCENTRATIONS NOT CORRECTED FOR STEAM LOSS, LOSS ESTIMATED TO BE 57 PERCENT.**

**BIBLIOGRAPHIC DATA**
- DATE: 76.
RECORD 142  SAGE 4-18  CEME-75343084-3  WATER  SAMPLE TYPE:

WELL: MEA 4-1  SAGE 4-18  CEME-75343084-3  WATER  SAMPLE TYPE:

RECORD 443  SAGE 5-19  CEME-75343084-3  WATER  SAMPLE TYPE:

LOCATION: T15S R16E SEC: 6 SE QUARTER CEME 696203 A  2307454 6X FT.

EMERSON COUNTY, CA USA

WELL INFORMATION
Completion: U.S. BUREAU OF RECLAMATION
Date Drilled: 23 JUN 72 - 16 AUG 72

WELL DATA
DEPTH: 2448 METERS
TEMPERATURE: 214 C AT BITTER MOLE

PLOW INFORMATION: PERCE PEDOMETER, THIONELTED FLOW: G-200
LEAD: LEAD, LEAD STEAM, PASS PEELED, PASS CH. FULL
FLOW: 1528 LEAD. LEAD STEAM, PASS PEELED, PASS CH. FULL

PRODUCTION INTERVAL: 300 M OF SELECTED CASING 920 FT.

CMENT: ALL DEPARTS MEASURED FROM RECYCLED BUSHING, 67 M ABOVE GROUND SURFACE

SAMPLING INFORMATION
DATE: AUG 17 1972
SAMPLE NUMBER: LABORATORY-DESERT RESEARCH INSTITUTE BOULDER CITY, NV
SAMPLE LOCATION: MPS DRILL OUT

SAMPLING METHOD: SAMPLE FILTERED, COLLECTED WITH 1 L poly.

Cement: UNLABLED, 10 M DILATED TO 100 M FOR SPECEFICATIONS

PHYSICAL DATA
Fill 1.64
SP. CONDUCTANCE: 29000.00 MICROHMS
SP. DISCHARGE: 2901.00 MICROHMS, SUL

BRINE DATA
METHOD OF ANALYSIS: METALS BY AN AND BY SPECIFIC ION ELECTRODES.

CHEMICAL CONCENTRATION

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BIBLIOGRAPHIC DATA
SOURCES:
1. SANGER, J. A.
2. SACRAMINO TA
3. Hsu, J.
RECORD 106
CODE 09916-8-10
SAMPLE TYPE=water

WELL ID: 6-1
EAST MESA 6-1
LOCAITON: 1370 S.W., SEC. 6, SE QUARTER,
IMPERIAL COUNTY, CA, USA

WELL DATA
DEPTH = 2446 FEET
TEMPERATURE = 294.6 °C AT BOTTOMhole,
FLOW INFORMATION: AFTER PERFORATION, UNBOOSTED FLOW = 646 GPM,
BRINE, NO STEAM, NO SAND,
PRODUCTION INTERVAL: 1960 FT OF ELUTED CASING, 1980 FT OF TOTAL PERFORATED LENGTH = 1960
COMMENTS: MEASURED FROM KELLY BPUSHING, 6.7 M ABOVE GROUND SURFACE.

SAMPLING INFORMATION
DATE = JUN. 31, 1976
SAMPLE NUMBER: LABORATORY= 446.4, USGS,
CONDITION OF SAMPLE: UNFILTERED BRINE,
CONDITION OF WELL DURING SAMPLING = WELL CASING PERFORATED,
HELMET PRESSURE = 16.1 PSI.

PHYSICAL DATA
pH = 9.6
TDS DISS SOLIDS = 2730.00 MG/L

BRIEF DATA
CATIONS=
S = 256.00
Mg = 315.00
Ca = 345.00
K = 17.00
Na = 121.00
MACEDO = 85.00

BIBLIOGRAPHIC DATA
SOURCES=
USGS 74
SOUTHWELL 76

RECORD 107
CODE 09916-8-11
SAMPLE TYPE=water

WELL ID: 6-1
EAST MESA 6-1
IMPERIAL COUNTY, CA, USA

SAMPLING INFORMATION
DATE = JUL. 27, 1976,
SAMPLE NUMBER: LABORATORY= 6214.4, USGS,
CONDITION OF SAMPLE: UNFILTERED BRINE,
CONDITION OF WELL DURING SAMPLING = WELL CASING PERFORATED,

PHYSICAL DATA
pH = 8.1
TDS DISS SOLIDS = 2741.60 MG/L

BRIEF DATA
CATIONS=
S = 136.00
Ca = 710
Mg = 320
K = 40
Na = 74

BIBLIOGRAPHIC DATA
SOURCES=
USGS 76
SOUTHWELL 76

RECORD 108
CODE 09916-8-12
SAMPLE TYPE=water

WELL ID: 6-1
EAST MESA 6-1
IMPERIAL COUNTY, CA, USA

SAMPLING INFORMATION
DATE = AUG. 11, 1976,
SAMPLE NUMBER: LABORATORY= 7017.1, USGS,
CONDITION OF SAMPLE: UNFILTERED BRINE,
CONDITION OF WELL DURING SAMPLING = AFTER WELL CASING PERFORATED,

PHYSICAL DATA
pH = 6.9
TDS DISS SOLIDS = 2901.66 MG/L

BRIEF DATA
CATIONS=
S = 136.00
Ca = 710
Mg = 320
K = 40
Na = 74

BIBLIOGRAPHIC DATA
SOURCES=
USGS 76
SOUTHWELL 76
RECORD 148
ECOLOGICAL AREA 6-18
SAMPLE TYPE=WATER

WELL MESA 4-13

TEST WELLS

WELL LOCATION: 3.500 E, 5.700 S
DISTANCE FROM CENTER: 502 ft
ELEVATION: 2,200 ft

WELL INFORMATION
DATE: 9-21-72
TIME: 3:30 PM

WELL DATA

WELL TYPE: FLOWING
WELL DEPTH: 250 ft
WELL DIA: 4 in

WATER DATA

WATER TYPE: FRESH WATER
WATER COLOR: CLEAR
WATER TEMPERATURE: 20°C
WATER pH: 7.2
WATER O2: 8 mg/L
WATER SO4: 3 mg/L
WATER TDS: 5 mg/L

REFRACTIVE INDEX: 1.338
SPECIFIC GRAVITY: 1.000
DISSOLVED SOLIDS: 20 mg/L

SAMPLING INFORMATION
SAMPLE SIZE: 1 L
SAMPLE TYPE: FILTERED
SAMPLE CONTAINMENT: GLASS JAR
SAMPLE CONCENTRATION: 0.010 mmol/L
SAMPLE TEMPERATURE: 10°C
SAMPLE PH: 7.2
SAMPLE O2: 8 mg/L
SAMPLE SO4: 3 mg/L
SAMPLE TDS: 5 mg/L

PHYSICAL DATA

TEMPERATURE: 20°C
SALINITY: 20 mg/L

BIOTIC DATA

PATHWAY DESIGN: 100% TERRAIN ANALYSIS
WATER TYPE: FILTERED

GEOLGICAL DATA

CEMENT: BARTLETT
SAMPLE: 1 BARTLETT

ANALYSIS: 100%

VALUES LISTED AS 4 A NUMBER—ASSUME 0-DETECTED.

BIBLIOGRAPHIC DATA

SHOEMAKER, W. L., et al. unpublished data.
RECORD 398  
VALUE LISTED AS A NUMBER—ASSUME NONE DETECTED.

RECORD 399

BIBLIOGRAPHIC DATA

SOURCES:
PHelps 76
DNHAN 76
GSP 76

WELL MESA 4-A


WELL INFRMATION
OCCUPYING SHAPE: BUREAU OF RECLAMATION.
DRILLER:  17 JUL 73 - 22 AUG 73

WELL DATA
LATITUDE  32.76 N, 114.94 W
LONITI:  17 JUL 73 - 22 AUG 73

SAMPLE INFORMATION
DATE:  3 JUN 74
SAMPLE NUMBER: 00001
SAMPLE LOCATION:  64-1-2
SAMPLE METHOD:  CIRCUIT AT/CIRCUIT AT
CONDITION OF SAMPLE:  UNFILTERED, UNFILTERED

PHYSICAL DATA
THERMOMETER:  32.76 N, 114.94 W
THERMOMETER:  32.76 N, 114.94 W

METHOD OF ANALYSIS:  ATOMIC ABSORPTION
METHOD OF ANALYSIS:  ATOMIC ABSORPTION

CONCENTRATION:  0.0000 M
CONCENTRATION:  0.0000 M

SAMPLE UNFILTERED.

BIBLIOGRAPHIC DATA
SOURCES:
PHelps 76
DNHAN 76
GSP 76

RECORD 524
CODE NUMBER:  4-20
SAMPLE TYPE: WATER

WELL: MESA 4-20
SAMPLE TYPE: WATER
LOCATION: 38° 42' 11.7" N, 114° 04' 51.8" W, SEC. 6, T. 5 S., R. 35 W., IMPERIAL COUNTY, CA. USA

WELL DATA:
DEPTH: 1830 METERS
TEMPERATURE: 187.3°F AT BOTTOM WELS.
FIELD INFORMATION: MAXIMUM 162.8 FT/MINUTE, PRODUCTION INTERVAL 3645-3656 FT, FIELD INFORMATION: MAXIMUM 162.8 FT/MINUTE, PRODUCTION INTERVAL 3645-3656 FT, FIELD INFORMATION: MAXIMUM 162.8 FT/MINUTE, PRODUCTION INTERVAL 3645-3656 FT.

SAMPLING INFORMATION:
DATE: 17 JUL 73
SAMPLE NUMBER: 10520
SAMPLE METHOD: DRILL STEM TEST INTERVAL 1670-1709 FT.

PHYSICAL DATA:
PRES 620
TET 4551.91
BU 210.8

RECORD 533
CODE NUMBER: 8-20
SAMPLE TYPE: WATER

WELL: MESA 4-20
SAMPLE TYPE: WATER
LOCATION: 38° 42' 11.7" N, 114° 04' 51.8" W, SEC. 6, T. 5 S., R. 35 W., IMPERIAL COUNTY, CA. USA

WELL DATA:
DEPTH: 1830 METERS
TEMPERATURE: 187.3°F AT BOTTOM WELS.
FIELD INFORMATION: MAXIMUM 162.8 FT/MINUTE, PRODUCTION INTERVAL 3645-3656 FT, FIELD INFORMATION: MAXIMUM 162.8 FT/MINUTE, PRODUCTION INTERVAL 3645-3656 FT, FIELD INFORMATION: MAXIMUM 162.8 FT/MINUTE, PRODUCTION INTERVAL 3645-3656 FT.

SAMPLING INFORMATION:
DATE: 17 JUL 73
SAMPLE NUMBER: 10520
SAMPLE METHOD: DRILL STEM TEST INTERVAL 1670-1709 FT.

PHYSICAL DATA:
PRES 620
TET 4551.91
BU 210.8
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
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<tbody>
<tr>
<td>Depth</td>
<td>1866 feet</td>
</tr>
<tr>
<td>Temperature at bottom of well</td>
<td>82°F</td>
</tr>
<tr>
<td>Production interval</td>
<td>3200-3279 feet</td>
</tr>
<tr>
<td>Total selected length</td>
<td>292 feet</td>
</tr>
<tr>
<td>Comment</td>
<td>All depths measured from kelly bushing, 6.4 ft above ground surface.</td>
</tr>
</tbody>
</table>

**Physical Data**

- **Sample number, laboratory**: 244501, 244502, 244503, 244504
- **Sample method**: Tapered with a stainless steel sampling tube
- **Condition of sample**: Unaltered
- **Condition of well during sampling**: Well flowing at a slow rate
- **Sample temperature during reading**: 75°C
- **Flow rate**: 24,920 mL/min
- **Total dissolved solids**: 7463.00 mg/L
- **Residue on evaporation at 103°C**: 4.10 g

**Sample Data**

- **Units**: mg/L

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<tr>
<th>Constituent</th>
<th>Concentration</th>
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</tr>
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<tbody>
<tr>
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<tr>
<td>BA</td>
<td>400</td>
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</tr>
<tr>
<td>CA</td>
<td>8.5</td>
<td></td>
</tr>
<tr>
<td>Fe</td>
<td>2.1</td>
<td></td>
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<tr>
<td>Mg</td>
<td>0.05</td>
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<tr>
<td>Ca</td>
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<td>K</td>
<td>173</td>
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<tr>
<td>Na</td>
<td>&lt;0.1</td>
<td>Total Phosphate 9.99</td>
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<tr>
<td>SO4</td>
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<tr>
<td>Cl</td>
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<td>CO3</td>
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<td>Fe</td>
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<td>Trace</td>
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<td>Ba</td>
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<td>Cu</td>
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<tr>
<td>F</td>
<td>&lt;0.1</td>
<td></td>
</tr>
<tr>
<td>Mg</td>
<td>&lt;0.1</td>
<td></td>
</tr>
<tr>
<td>S</td>
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<td>Si</td>
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<tr>
<td>Ba</td>
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<tr>
<td>Na</td>
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<td></td>
</tr>
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**Values listed as a # number**: Assume none detected.

**Bibliographic Data**

- **Source**: PAPAZIAN, L. J., 1974
- **Location**: IMPERIAL COUNTY, CA, USA
RECORD 160
CREEK NARROW EAST MESA 18-29
SAMPLE TYPE=water

WELL EAST MESA 18-29
EAST MESA FORM
ELEVATION= 7125', SITE: SEC. 29, T.29N, R.29E, FROM 16 CREEK, EMERALD COUNTY, N.J., USA

WELL INFORMATION
TYPE= REPUBLIC GEOTHERMAL, INC. AND CITY OF RUBANS, CALIF.
DRILLING COMPANY= REPUBLIC DRILLING COMPANY
DATE DRILLED= 4 OCT 73 - 10 DEC 73

WELL DATA
DEPT= 2045 METERS
TEMPERATURE= 362 C AT 2350 METERS
363 C AT 2320 METERS
339 C AT 1210 METERS
332 C AT 915 METERS
318 C AT 690 METERS
FLOW RATE= 111.75 GPM
PRODUCTION INTERVAL: WELL EAGLE PERFORATED 1955-2320 M AND
2026-2468.9 M. TOTAL INTERVAL PERFORATED = 40.9 M.
RESERVOIR ELEVATION= EAGLE
ELEVATION: TEMPERATURES LOGGED 19 DEC 73

BULKING INFORMATION
DATE= 14 JAN 74
SAMPLE NUMBER: 362-19部主任. QUALITY WATER LABORATORY, INC.
SAMPLE LOCATION= 16 CREEK
EXHAUSTED OF WELLführt TAKING— FLOWING AT 30 GPM.

PHYSICAL DATA
F= 8.00
SO = 0.03
CONDUCTIVITY= 526.00 MICROSIEMENS
TGT DRY SALTS= 1947.00 MCG/L
ALKALINITY= 550 MCG/L
ARD= 24.000

BULKING DATA
METHOD OF ANALYSIS= USGS WATER RESOURCES INVESTIGATIONS 22-74
UNIT= MCG/L

COH= 382.00
DICARBONATE AS CACO3= 382.00
ESTIMATED AS CACO3= 382.00

RESEARCHER: SMITH '77

BIBLIOGRAPHIC DATA
SOURCE: SMITH '77
**RECORD 167**

**CODE NAME**: EAST MESA 5A-28

**SAMPLE TYPE**: WATER

**WELL EAST MESA 5A-28**

**EAST MESA RD**

**COUNTY**: EL PASO

**STATE**: NM

**WELL INFORMATION**

- Company: REYNOLDS OIL & GAS INC
- Location: DESERT CENTER, CA

**WELL DATA**

- **Depth**: 2490 Meters
- **Temperature**: 121.2°F at 2390 Meters
- **Flow**: 153 C at 214.5 Meters

**FLUID INFORMATION**

- **Flux**: 150.5°C
- **Permeability**: 25 GPM

**RESEARCH LABORATORY**: SOUTHWESTERN

**Condition of Well During Sampling**: Flowing at 30 GPM

**PHYSICAL DATA**

- **SALT**: 5000 mg/L
- **Temp**: 121.2°F
- **Residue on Evaporation**: 1240.0 mg/L

**BIBLIOGRAPHIC DATA**

- **Source**: SWRCB 74

---

**RECORD 546**

**CODE NAME**: EAST MESA 22-88

**SAMPLE TYPE**: WATER

**WELL MESA 2**

**FISK RD**

**COUNTY**: IMPERIAL

**STATE**: CA

**WELL INFORMATION**

- Company: CONIFER OIL & GAS INC
- Location: IMPERIAL, CA

**WELL DATA**

- **Depth**: 2625.28 feet
- **Date Drilled**: 13 AUG 74 - 13 SEP 74

**PHYSICAL DATA**

- **SALT**: 13184.0 mg/L

**BIBLIOGRAPHIC DATA**

- **Source**: SWRCB 74

---

**RECORD 163**

**CODE NAME**: MESA 22-88

**SAMPLE TYPE**: WATER

**WELL MESA 2**

**FISK RD**

**COUNTY**: IMPERIAL

**STATE**: CA

**WELL INFORMATION**

- Company: CONIFER OIL & GAS INC
- Location: IMPERIAL, CA

**WELL DATA**

- **Depth**: 2625.28 feet
- **Date Drilled**: 13 AUG 74 - 13 SEP 74

**PHYSICAL DATA**

- **SALT**: 13184.0 mg/L

**BIBLIOGRAPHIC DATA**

- **Source**: SWRCB 74

---

**RECORD 545**

**CODE NAME**: MESA 22-88

**SAMPLE TYPE**: WATER

**WELL MESA 2**

**FISK RD**

**COUNTY**: IMPERIAL

**STATE**: CA

**WELL INFORMATION**

- Company: CONIFER OIL & GAS INC
- Location: IMPERIAL, CA

**WELL DATA**

- **Depth**: 2625.28 feet
- **Date Drilled**: 13 AUG 74 - 13 SEP 74

**PHYSICAL DATA**

- **SALT**: 13184.0 mg/L

**BIBLIOGRAPHIC DATA**

- **Source**: SWRCB 74
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<tr>
<th>CONSTITUENT</th>
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<th>COMMENT</th>
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<td>SiO2</td>
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</tr>
<tr>
<td>Mg</td>
<td>5ppm</td>
<td></td>
</tr>
<tr>
<td>Fe</td>
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**BIBLIOGRAPHIC DATA**

**SOURCES:**

- **Wells:** USGS 74
- **Wells:** USGS 74

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**WELL DATA**

**DATE:** 03 SEP 83

** CONSTITUENT | CONCENTRATION | TRACE | COMMENT |
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<td>Ca</td>
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<tr>
<td>Mg</td>
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</tr>
<tr>
<td>Fe</td>
<td>1ppm</td>
<td></td>
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</tr>
<tr>
<td>Zn</td>
<td>2ppm</td>
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**BIBLIOGRAPHIC DATA**

**SOURCES:**

- **Wells:** USGS 74
- **Wells:** USGS 74
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<thead>
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<th>Record 170</th>
<th>CODE: NaI-Fracceous 3</th>
<th>SAMPLE TYPE: Total</th>
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<tbody>
<tr>
<td>WELL INFORMATION</td>
<td>Composition: NaI-Fracceous Power Co. Magna Energy Co.</td>
<td>GATE DRILLED: 31 Aug 60 - 10 Aug 60</td>
</tr>
<tr>
<td>WELL DATA</td>
<td>DEPTH: 192 FEET</td>
<td>TEMPERATURE: 136.8 AT 222 METERS</td>
</tr>
<tr>
<td>FLOW INFORMATION</td>
<td>49000 GPM STEAM, 25520 LB/WATER AT 216.5</td>
<td></td>
</tr>
<tr>
<td>SAMPLING INFORMATION</td>
<td>SAMPLE TAKEN FROM WELLSHEAD AFTER COOLING, NO STEAM PRESSED</td>
<td></td>
</tr>
<tr>
<td>PHYSICAL DATA</td>
<td>PH: 7.50</td>
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<td>BRINE DATA</td>
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</tr>
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<td>GATE DRILLED: 12 Sep 60 - 24 Sep 60</td>
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<td>WELL DATA</td>
<td>DEPT: 180 FEET</td>
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<td>FLOW INFORMATION</td>
<td>49000 GPM STEAM, 25520 LB/WATER AT 216.5</td>
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</tr>
<tr>
<td>SAMPLING INFORMATION</td>
<td>SAMPLE TAKEN FROM WELLSHEAD AFTER COOLING, NO STEAM PRESSED</td>
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<tr>
<td>PHYSICAL DATA</td>
<td>PH: 8.80</td>
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</tr>
</thead>
<tbody>
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<td>Composition: NaI-Fracceous Power Co. Magna Energy Co.</td>
<td>GATE DRILLED: 12 Sep 60 - 24 Sep 60</td>
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<tr>
<td>WELL DATA</td>
<td>DEPT: 150 FEET</td>
<td>TEMPERATURE: 219.7 AT 222 METERS</td>
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<td>FLOW INFORMATION</td>
<td>49000 GPM STEAM, 25520 LB/WATER AT 216.5</td>
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<td>SAMPLING INFORMATION</td>
<td>SAMPLE TAKEN FROM WELLSHEAD AFTER COOLING, NO STEAM PRESSED</td>
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<td>GATE DRILLED: 12 Sep 60 - 24 Sep 60</td>
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<td>WELL DATA</td>
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<td>49000 GPM STEAM, 25520 LB/WATER AT 216.5</td>
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<td>SAMPLING INFORMATION</td>
<td>SAMPLE TAKEN FROM WELLSHEAD AFTER COOLING, NO STEAM PRESSED</td>
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<td>PHYSICAL DATA</td>
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<td>BRINE DATA</td>
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BIBLIOGRAPHIC DATA
SCIENCE | MC WITT 63 | REFMAN 65

BIBLIOGRAPHIC DATA
SCIENCE | MC WITT 63 | REFMAN 66

BIBLIOGRAPHIC DATA
SCIENCE | MC WITT 63 | REFMAN 67

BIBLIOGRAPHIC DATA
SCIENCE | MC WITT 63 | REFMAN 68

BIBLIOGRAPHIC DATA
SCIENCE | MC WITT 63 | REFMAN 69
**Record 185**
**Code Name:** Merrimack Geothermal SCP-2
**Sample Type:** Water

**Well Name:** Geothermal SCP-2
**State:** Massachusetts

**History:**
- **Well:** Geothermal SCP-2
- **County:** Merrimack
- **Year:** 1970

**Well Data:**
- **Depth:** 1344 meters
- **Temperature:** 200.6°C at 1340 meters

**Sampling Information:**
- **Date:** Aug 29, 1970
- **Sample Location:** Wellhead

**Physical Data:**
- **SiO2:** 151 µg/L
- **Ca:** 134 µg/L
- **Mg:** 275 µg/L
- **Fe:** 0.001 µg/L

**After Steam Flashed**

**Bibliographic Data:**
- **Source:** SHAPE 77

---

**Record 186**
**Code Name:** Merrimack Geothermal SCP-2
**Sample Type:** Water

**Well Name:** Geothermal SCP-2
**State:** Massachusetts

**History:**
- **Well:** Geothermal SCP-2
- **County:** Merrimack
- **Year:** 1970

**Well Data:**
- **Depth:** 1344 meters
- **Temperature:** 200.6°C at 1340 meters

**Sampling Information:**
- **Date:** Aug 29, 1970
- **Sample Location:** Wellhead

**Physical Data:**
- **SiO2:** 151 µg/L
- **Ca:** 134 µg/L
- **Mg:** 275 µg/L
- **Fe:** 0.001 µg/L

**After Steam Flashed**

**Bibliographic Data:**
- **Source:** SHAPE 77

---

**Record 187**
**Code Name:** Merrimack Geothermal SCP-2
**Sample Type:** Water

**Well Name:** Geothermal SCP-2
**State:** Massachusetts

**History:**
- **Well:** Geothermal SCP-2
- **County:** Merrimack
- **Year:** 1970

**Well Data:**
- **Depth:** 1344 meters
- **Temperature:** 200.6°C at 1340 meters

**Sampling Information:**
- **Date:** Aug 29, 1970
- **Sample Location:** Wellhead

**Physical Data:**
- **SiO2:** 151 µg/L
- **Ca:** 134 µg/L
- **Mg:** 275 µg/L
- **Fe:** 0.001 µg/L

**After Steam Flashed**

**Bibliographic Data:**
- **Source:** SHAPE 77

---

**Record 188**
**Code Name:** Merrimack Geothermal SCP-2
**Sample Type:** Water

**Well Name:** Geothermal SCP-2
**State:** Massachusetts

**History:**
- **Well:** Geothermal SCP-2
- **County:** Merrimack
- **Year:** 1970

**Well Data:**
- **Depth:** 1344 meters
- **Temperature:** 200.6°C at 1340 meters

**Sampling Information:**
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**Sample Type:** Water

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**Bibliographic Data:**
- **Source:** SHAPE 77

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**Sample Type:** Water

**Well Name:** Geothermal SCP-2
**State:** Massachusetts

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- **Year:** 1970

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**Well Name:** Geothermal SCP-2
**State:** Massachusetts

**History:**
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**Bibliographic Data:**
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**Code Name:** Merrimack Geothermal SCP-2
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**Well Name:** Geothermal SCP-2
**State:** Massachusetts

**History:**
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- **County:** Merrimack
- **Year:** 1970

**Well Data:**
- **Depth:** 1344 meters
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**Sampling Information:**
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**Physical Data:**
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- **Mg:** 275 µg/L
- **Fe:** 0.001 µg/L

**After Steam Flashed**

**Bibliographic Data:**
- **Source:** SHAPE 77

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**Record 193**
**Code Name:** Merrimack Geothermal SCP-2
**Sample Type:** Water

**Well Name:** Geothermal SCP-2
**State:** Massachusetts

**History:**
- **Well:** Geothermal SCP-2
- **County:** Merrimack
- **Year:** 1970

**Well Data:**
- **Depth:** 1344 meters
- **Temperature:** 200.6°C at 1340 meters

**Sampling Information:**
- **Date:** Aug 29, 1970
- **Sample Location:** Wellhead

**Physical Data:**
- **SiO2:** 151 µg/L
- **Ca:** 134 µg/L
- **Mg:** 275 µg/L
- **Fe:** 0.001 µg/L

**After Steam Flashed**

**Bibliographic Data:**
- **Source:** SHAPE 77

---

**Record 194**
**Code Name:** Merrimack Geothermal SCP-2
**Sample Type:** Water

**Well Name:** Geothermal SCP-2
**State:** Massachusetts

**History:**
- **Well:** Geothermal SCP-2
- **County:** Merrimack
- **Year:** 1970

**Well Data:**
- **Depth:** 1344 meters
- **Temperature:** 200.6°C at 1340 meters

**Sampling Information:**
- **Date:** Aug 29, 1970
- **Sample Location:** Wellhead

**Physical Data:**
- **SiO2:** 151 µg/L
- **Ca:** 134 µg/L
- **Mg:** 275 µg/L
- **Fe:** 0.001 µg/L

**After Steam Flashed**

**Bibliographic Data:**
- **Source:** SHAPE 77

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**Record 195**
**Code Name:** Merrimack Geothermal SCP-2
**Sample Type:** Water

**Well Name:** Geothermal SCP-2
**State:** Massachusetts

**History:**
- **Well:** Geothermal SCP-2
- **County:** Merrimack
- **Year:** 1970

**Well Data:**
- **Depth:** 1344 meters
- **Temperature:** 200.6°C at 1340 meters

**Sampling Information:**
- **Date:** Aug 29, 1970
- **Sample Location:** Wellhead

**Physical Data:**
- **SiO2:** 151 µg/L
- **Ca:** 134 µg/L
- **Mg:** 275 µg/L
- **Fe:** 0.001 µg/L

**After Steam Flashed**

**Bibliographic Data:**
- **Source:** SHAPE 77

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RECORD 201
CODE NAME=HAWAI GEOTHERMAL 2B
SAMPLE TYPE=WATER

WELL NAME=GEOTHERMAL 2B
PUNA GEOTHERMAL FIELD
HAWAII COUNTY, HAWAII, USA

SAMPLING INFORMATION
DATE= 21 JUL 75
SAMPLE LOCATION= TANK 25 - 20 FT below water surface,
CONDITION OF SAMPLE-- TEMPERATURE = 74 C.

PHYSICAL DATA
PH = 7.4

BRENE DATA
UNITS-- NGL

CONSTIT- CONCENT- TRATION CEMENT

K+ 1700
Ca 300
Mg 42.8
Cl 329
SO4 380
HCO3 293
F 14

BIBLIOGRAPHIC DATA
SOURCE= SHAPE 76
RUNJOB 76

RECORD 292
CODE NAME=HAWAI GEOTHERMAL 2A
SAMPLE TYPE=WATER

WELL NAME=GEOTHERMAL 2A
PUNA GEOTHERMAL FIELD
HAWAII COUNTY, HAWAII, USA

SAMPLING INFORMATION
DATE= 21 JUL 75
SAMPLE LOCATION= TANK 15 - 20 FT below water surface,
CONDITION OF SAMPLE-- TEMPERATURE = 74 C.

PHYSICAL DATA
PH = 7.4

BRENE DATA
UNITS-- NGL

CONSTIT- CONCENT- TRATION CEMENT

K+ 1700
Ca 300
Mg 42.8
Cl 329
SO4 380
HCO3 293
F 14

BIBLIOGRAPHIC DATA
SOURCE= SHAPE 76
RUNJOB 76
### Record 291
#### Well Name: NA01
#### Sample Type: Normalizable Gases

**Well Information**
- **State:** TX
- **County:** 3222
- **City:** CASSIA COUNTY, FL, USA

**Well Data**
- **Depth:** 1500 meters
- **Temperature:** 114°C at 1500 meters

**Sampling Information**
- **Condition of Sample:** Pressurized samples; 9°C boiling point
- **Condition of Well During Sampling:** Closed well, full flow

**Physical Data**
- **SP. Conductance:** 2000.00 millimhos/cm
- **Salinity:** Given as 3700 microsiemens/cm
- **Total Gases at 37°C:** 46.7 ml/l

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**Bibliographic Data**
- **Source:** NA01
- **Notes:** NA01

### Record 292
#### Well Name: NA01
#### Sample Type: Non-normalizable Gases

**Well Information**
- **State:** TX
- **County:** 3222
- **City:** CASSIA COUNTY, FL, USA

**Well Data**
- **Depth:** 1500 meters
- **Temperature:** 114°C at 1500 meters

**Sampling Information**
- **Condition of Sample:** Pressurized samples; 9°C boiling point
- **Condition of Well During Sampling:** Closed well, full flow

**Physical Data**
- **SP. Conductance:** 2000.00 millimhos/cm
- **Salinity:** Given as 3700 microsiemens/cm
- **Total Gases at 37°C:** 46.7 ml/l

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**Bibliographic Data**
- **Source:** NA01
- **Notes:** NA01
### RECORDER 215
**CODE:** WASHINGTON 12  SAMPLE TYPE: WATER

**WELL:** 11A
**FATT RIVER RIVER**
**CASSEL COUNTY, IOWA, USA**

**SAMPLING INFORMATION**
- DATE: 21 SEP 80
- BOREHOLE: 11A
- SAMPLE NUMBER: 1
- EXTRACTED: 30 MILLION
- SAMPLE DETAILS: 100G
- SAMPLING METHOD: DROP IN PLENUM CONTAINER
- SAMPLE ANALYSIS: 15 MILLION

**PHYSICAL DATA**
- TD: 21 SEP 80
- ID: 11A
- TEMPERATURE: 54F
- DEPTH: 8530 PPM
- WATER TYPE: TEMPERATE

**GEOCHEMICAL DATA**

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**BIBLIOGRAPHIC DATA**
- SOURCE: 1975

### RECORDER 221
**CODE:** WASHINGTON 20  SAMPLE TYPE: WATER

**WELL:** 12A
**FATT RIVER RIVER**
**CASSEL COUNTY, IOWA, USA**

**SAMPLING INFORMATION**
- DATE: 21 SEP 80
- BOREHOLE: 12A
- SAMPLE NUMBER: 1
- EXTRACTED: 30 MILLION
- SAMPLE DETAILS: 100G
- SAMPLING METHOD: DROP IN PLENUM CONTAINER
- SAMPLE ANALYSIS: 15 MILLION

**PHYSICAL DATA**
- TD: 21 SEP 80
- ID: 12A
- TEMPERATURE: 54F
- DEPTH: 8530 PPM
- WATER TYPE: TEMPERATE

**GEOCHEMICAL DATA**

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**BIBLIOGRAPHIC DATA**
- SOURCE: 1975
**RECORD 214**

**CODE NAME:** PEARL 20

**SAMPLE TYPE:** WATER

---

**WELL NAME:** PEARL 2

**COUNTY:** CASPER, ID., USA

**SAMPLE INFORMATION:**
- **DATE:** 3 JUN 75
- **LABORATORY:** 2-36224-6
- **SAMPLE LOCATION:** IN PLASTIC BOTTLE.
- **CONDITION OF SAMPLE:** UNFILTERED.
- **PHYSICAL DATA:**
  - **UNIT:** PPM
  - **TDS:** 17.2
  - **GEOCHEMICAL TEMPERATURE:** 180°C; QUARTZ: 140°C

**BIBLIOGRAPHIC DATA:**
- **SOURCE:** MCAFFEE et al.

---

**CONCENTRATIONS:**

<table>
<thead>
<tr>
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**RECORD 215**

**CODE NAME:** PEARL 21

**SAMPLE TYPE:** WATER

---

**WELL NAME:** PEARL 2

**COUNTY:** CASPER, ID., USA

**SAMPLE INFORMATION:**
- **DATE:** 3 JUN 75
- **LABORATORY:** 2-36224-6
- **SAMPLE LOCATION:** IN PLASTIC BOTTLE.
- **CONDITION OF SAMPLE:** UNFILTERED.
- **PHYSICAL DATA:**
  - **UNIT:** PPM
  - **TDS:** 17.2
  - **GEOCHEMICAL TEMPERATURE:** 180°C; QUARTZ: 140°C

**BIBLIOGRAPHIC DATA:**
- **SOURCE:** MCAFFEE et al.

---

**CONCENTRATIONS:**

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<tr>
<th>CONCENTRATION</th>
<th>COMMENT</th>
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---

**RECORD 216**

**CODE NAME:** PEARL 22

**SAMPLE TYPE:** WATER

---

**WELL NAME:** PEARL 2

**COUNTY:** CASPER, ID., USA

**SAMPLE INFORMATION:**
- **DATE:** 7 JUL 75
- **LABORATORY:** 2-36224-6
- **SAMPLE LOCATION:** IN PLASTIC BOTTLE.
- **CONDITION OF SAMPLE:** UNFILTERED.
- **PHYSICAL DATA:**
  - **UNIT:** PPM
  - **TDS:** 17.2
  - **GEOCHEMICAL TEMPERATURE:** 180°C; QUARTZ: 140°C

**BIBLIOGRAPHIC DATA:**
- **SOURCE:** MCAFFEE et al.
WELL II2.7
LOCATION- K 35-1-12E-22N
DATE- 6-27-79

WELL INFORMATION
OWNER- INTERNAL RELATIVE PRODUCTS, INC.
DRILLER- H. T. C. COMPANY, INC.

WELL DATA
DEPTH- 3712 FT.
TEMPERATURE- 218 F AT BOREHOLE.

SANDSTONE SENSOR- 8785-8789, 8791-8796.
WELL DRILLED- 19 JUN 67 - 8 AUG 67
WELL ABANDONED 1967-77.

SAMPLING INFORMATION
DATE- 25 JUN 69.
SAMPLE NUMBER- 17927-81.
SAMPLE LOCATION- U.S. GEOLOGICAL SURVEY.

WELL DATA
TEMP- 218 F.
WELL TESTED- 216 F.
WELL TEST- 11 FEB 67-12 DEC 67.


PHYSICAL DATA
FRACTION- 9.80
FLOW 25,000 GPH.
TEMP DURING READINGS 20 C.
WATER DATA
METHOD OF ANALYSIS- CONSIDERED BEST VALUES FROM SAMPLES BY
DETERMINATION OF SHEAR AND STEAM VOLUME.

WATER CONCENTRATIONS

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SCIENCE- WHITE 69
DEPOT 73
MURPHY 65
FALCONER 73
PHELPS 76
WEIL 72
WHITE 67

DATA NOT CORRECTED FOR STEAM LOSS.
RECORD 236
EWEB WELD 3
SAMPLE WELDED ON
SAMPLE TYPE: WELD

WELL INFO:
SALTIN WELD 1
EMERALD CEMENT, CA, USA

WELL INFORMATION
OWNER: EMERALD CEMENT, INC.
DATE: 07/15/74

WELL DATA:
DEPTH: 13,500 FT
TEMPERATURE: 120°F AT BOTTOM HOLE

SAMPLE INFORMATION
DATE: 07/15/74
SAMPLE SIZE: 2000 G
STORAGE TEMPERATURE: 70°F

PHYSICAL DATA:
TESTS:
SPECM. GRAVITY: 3.235

DATA NOT VERIFIED.
BIBLIOGRAPHIC DATA
REFERENCES:
WELD 76.
RECORD 266
CODE NUMBERED 11
SAMPLE TYPEWATER

WELL ID 9
SALTON SEA GPCA
IMPERIAL COUNTY, CA., USA

WELL INFORMATION
OWNER-- EMPIRE THERMAL PRODUCTS, INC.

WELL DATA
DEPTH ---- 1591 METERS
TEMPERATURE 315 C AT BOTTOM HOLE

SAMPLE INFORMATION
DATE-- 31 MAY 75
SAMPLE NUMBER, LABORATORY-- U.S. GEOLOGICAL SURVEY, MENLO PARK,
CA.
CONDITION OF SAMPLE-- TEMP = 315.5 C

PHYSICAL DATA
FpH 7.00
TCT DISS SOLIDS= 32,620.00 MG/L, RESIDUE ON EVAPORATION

BREATH DATA

UNIT-- MG/L

CONCENT- FRAC- COMMENT
R 95000
K 80000
Ca 5500
Mg 4500
Na 4000
Cl 3500

DATA NOT VERIFIED.

BIBLIOGRAPHIC DATA
SOURCE-- DRJ 76

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RECORD 268
CODE NUMBERED 11
SAMPLE TYPEWATER

WELL ID 4
SALTON SEA GPCA
IMPERIAL COUNTY, CA., USA

WELL INFORMATION
OWNER-- EMPIRE THERMAL PRODUCTS, INC.

WELL DATA
DEPTH ---- 1591 METERS
TEMPERATURE 315 C AT BOTTOM HOLE

SAMPLE INFORMATION
DATE-- 31 MAY 75
SAMPLE NUMBER, LABORATORY-- U.S. GEOLOGICAL SURVEY, MENLO PARK,
CA.
CONDITION OF SAMPLE-- TEMP = 315.5 C

PHYSICAL DATA
FpH 7.00
TCT DISS SOLIDS= 32,620.00 MG/L, RESIDUE ON EVAPORATION

BREATH DATA

UNIT-- MG/L

CONCENT- FRAC- COMMENT
R 95000
K 80000
Ca 5500
Mg 4500
Na 4000
Cl 3500

DATA NOT VERIFIED.

BIBLIOGRAPHIC DATA
SOURCE-- DRJ 76
### WELL ID 1
**Well Name:** ID 360600 560619
**Well Information:** Imperial Valley, CA, USA

#### Well Data
- **Depth:** 300 feet
- **Temperature:** 31°C at bottom hole

#### Sampling Information
- **Date:** 10 May 78
- **Sample Name:** Flow rate
- **Laboratory:** U.S. Geological Survey, Menlo Park, CA
- **Condition:** Temp = 31°C

#### Physical Data
- **TDS (mg/L):** 370400
- **Residue on evaporation:**

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#### Bibliographic Data
- Source: DW 39

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### WELL ID 2
**Well Name:** ID 360600 560619
**Well Information:** Imperial Valley, CA, USA

#### Well Data
- **Depth:** 300 feet
- **Temperature:** 31°C at bottom hole

#### Sampling Information
- **Date:** 10 May 78
- **Sample Name:** Flow rate
- **Laboratory:** U.S. Geological Survey, Menlo Park, CA
- **Condition:** Temp = 31°C

#### Physical Data
- **TDS (mg/L):** 370400
- **Residue on evaporation:**

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#### Data Not Verified.

#### Bibliographic Data
- Source: DW 39

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### WELL ID 3
**Well Name:** ID 360600 560619
**Well Information:** Imperial Valley, CA, USA

#### Well Data
- **Depth:** 300 feet
- **Temperature:** 31°C at bottom hole

#### Sampling Information
- **Date:** 10 May 78
- **Sample Name:** Flow rate
- **Laboratory:** U.S. Geological Survey, Menlo Park, CA
- **Condition:** Temp = 31°C

#### Physical Data
- **TDS (mg/L):** 370400
- **Residue on evaporation:**

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#### Data Not Verified.

#### Bibliographic Data
- Source: DW 39

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### WELL ID 4
**Well Name:** ID 360600 560619
**Well Information:** Imperial Valley, CA, USA

#### Well Data
- **Depth:** 300 feet
- **Temperature:** 31°C at bottom hole

#### Sampling Information
- **Date:** 10 May 78
- **Sample Name:** Flow rate
- **Laboratory:** U.S. Geological Survey, Menlo Park, CA
- **Condition:** Temp = 31°C

#### Physical Data
- **TDS (mg/L):** 370400
- **Residue on evaporation:**

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#### Bibliographic Data
- Source: DW 39
RECORD 102
CODE NAME=1ST 36
SAMPLE TYPE-WATER

WELL 1ST 3
SALTIC, SE 36G
LOCATION: T35S, R36W, Sec. 37, T10N, R12W, Sec. 39, 2400 ft. NE FROM N.C. EAGLE, IMPERIAL COUNTY, CA, USA

WELL INFORMATION
OWNER: IMPERIAL THERMAL PRODUCERS, INC.
OPERATING COMPANY: SHIEL DEVELOPMENT COMPANY
DATE DRILLED: 25 NOV 63 - 20 DEC 63
WELL DESIGNATION: 36A

WELL DATA
DEPTH: 1749 FEET
TEMPERATURE: 330° F AT M MAX.
FLOW INFORMATION: 63200 CUB. FT. AT 25° PSI AND 28 PERCENT STEAM-HAMILTON, 30000 CUB. FT. AT 25° PSI AND 25 PERCENT STEAM-HAMILTON.
PREPARATION INSTRUCTIONS: Casing perforated 1000-1225 ft.

SAMPLING INFORMATION
SAMPLE NUMBER: LABORATORY- SHELL DEVELOPMENT COMPANY AND SCIENTIFIC SOURCES OF MIDLAND RESEARCH FOUNDATION.
CONDITION OF WELL DURING SAMPLE: WELL PUMPED FROM FREEZING, 2000 GALLONS AT 110° F, MEASURED TEMPERATURE AT THIS DEPTH: 326° C.

PHYSICAL DATA
PH: 6.46
TCT DISC SELLS: 25000.00 M.P.U., SUM
OTHER DATA:
ENTHILITY/33 CEL/CG
CEMENT: PA 23 IS INJECTED.

BRIEF DATA ANALYSIS- DATA ARE AVERAGES OF SEVERAL HUNDRED ANALYSES.

UNIT: FWU

CEMENT: FILTER: STATION: CONTENT

SIBLEH OF

TOTAL SULFATE

CONCENTRATION CORRECTED FOR STEAM LOSS.

BIOLOGICAL DATA
SOURCE: CITY OF IMPERIAL, MILLER, MILLER

RECORD 103
CODE NAME=1ST 36
SAMPLE TYPE-WATER

WELL 1ST 3
SALTIC, SE 36G
LOCATION: T35S, R36W, Sec. 37, T10N, R12W, Sec. 39, 2400 ft. NE FROM N.C. EAGLE, IMPERIAL COUNTY, CA, USA

WELL DATA
DEPTH: 1749 FEET
TEMPERATURE: 330° F AT MAX.
FLOW INFORMATION: 63200 CUB. FT. AT 25° PSI AND 28 PERCENT STEAM-HAMILTON, 30000 CUB. FT. AT 25° PSI AND 25 PERCENT STEAM-HAMILTON.
PREPARATION INSTRUCTIONS: Casing perforated 1000-1225 ft.

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BRIEF DATA ANALYSIS- DATA ARE AVERAGES OF SEVERAL HUNDRED ANALYSES.

UNIT: FWU

CEMENT: FILTER: STATION: CONTENT

SIBLEH OF

TOTAL SULFATE

CONCENTRATION CORRECTED FOR STEAM LOSS.
RECORD 211
Sheet Number 22
Sample Identification

WELL 12-3
Location: 12-3, Sec. 22, T. 24 N., R. 21 W., Texas Co., Okla.

WELL DATA
Date: July 21, 1949
Depth: 12,875 ft

SAMPLING INFORMATION
Temperature: 230°F
Flow Rate: 350 gpm
Pressure: 200 psi

PHYSICAL DATA
Flow Rate: 350 gpm
Temperature: 230°F
Pressure: 200 psi

OTHER DATA
Sampled: July 21, 1949

RECORD 211
Sheet Number 22
Sample Identification

WELL 12-3
Location: 12-3, Sec. 22, T. 24 N., R. 21 W., Texas Co., Okla.

WELL DATA
Date: July 21, 1949
Depth: 12,875 ft

SAMPLING INFORMATION
Temperature: 230°F
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WELL DATA
Date: July 21, 1949
Depth: 12,875 ft

SAMPLING INFORMATION
Temperature: 230°F
Flow Rate: 350 gpm
Pressure: 200 psi

PHYSICAL DATA
Flow Rate: 350 gpm
Temperature: 230°F
Pressure: 200 psi

OTHER DATA
Sampled: July 21, 1949
RECORD 206
CODE NAME:radeswan 10
SAMPLE TYPE:SPATIAL WATER

WELL NUMBER 1
SALTON SEA AREA
LOCATION: T11S, R16S, SEC. 33, 1200 FT E, 2000 FT S, FROM N QUARTER CORNER

IMPERIAL COUNTY, CA, USA

WELL INFORMATION
OWNER: IMPERIAL NUCLEAR ENGINEERING, INC
DATE DRILLED: 6 JAN 72 - 21 JAN 72

WELL DATA
DEPTH: 475 METERS
TEMPERATURE: 29.6 C AT WELLHEAD
24.6 C AT BOSCH HOLE

SAMPLING INFORMATION
DATE: 17 JAN 72

PHYSICAL DATA
PH: 7.46
SPECIFIC GRAVITY: 1.021
TEMP DURING TESTING: 20 C
TGT 0.5% SULFATE: 189500 MG/L SULFATE ON ENTRAPMENT

BRIEFS DATA
MATERIALS:

CONSISTENCY: COAGULATED CONCENTRATION: CONTENT

SG: 1.0
800
L: 700
S: 250
E: 47
W: 100
F: 95
H: 0

BIBLIOGRAPHIC DATA
SOURCE:
- "NATIONAL WELL DRILLING" 1972
- "GOVERNMENT" 1972
- "WELL DATA" 1972
- "PUBLICATION" 1972

RECORD 207
CODE NAME:radeswan 11

WELL NUMBER 2
SALTON SEA AREA
LOCATION: T11S, R16S, SEC. 33, 1200 FT E, 2000 FT S, FROM N QUARTER CORNER

IMPERIAL COUNTY, CA, USA

WELL INFORMATION
OWNER: IMPERIAL NUCLEAR ENGINEERING, INC
DATE DRILLED: 6 JAN 72 - 21 JAN 72

WELL DATA
DEPTH: 475 METERS
TEMPERATURE: 29.6 C AT WELLHEAD

SAMPLING INFORMATION
DATE: 17 JAN 72

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H: 0

BIBLIOGRAPHIC DATA
SOURCE:
- "NATIONAL WELL DRILLING" 1972
- "GOVERNMENT" 1972
- "WELL DATA" 1972
- "PUBLICATION" 1972

RECORD 208
CODE NAME:radeswan 12

WELL NUMBER 3
SALTON SEA AREA
LOCATION: T11S, R16S, SEC. 33, 1200 FT E, 2000 FT S, FROM CENTER

IMPERIAL COUNTY, CA, USA

WELL INFORMATION
OWNER: IMPERIAL NUCLEAR ENGINEERING, INC
DATE DRILLED: 6 JAN 72 - 21 JAN 72

WELL DATA
DEPTH: 475 METERS
TEMPERATURE: 29.6 C AT WELLHEAD

SAMPLING INFORMATION
DATE: 17 JAN 72

PHYSICAL DATA
PH: 7.46
SPECIFIC GRAVITY: 1.021
TEMP DURING TESTING: 20 C
TGT 0.5% SULFATE: 189500 MG/L SULFATE ON ENTRAPMENT

BRIEFS DATA
MATERIALS:

CONSISTENCY: COAGULATED CONCENTRATION: CONTENT

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L: 700
S: 250
E: 47
W: 100
F: 95
H: 0

BIBLIOGRAPHIC DATA
SOURCE:
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- "GOVERNMENT" 1972
- "WELL DATA" 1972
- "PUBLICATION" 1972

RECORD 209
CODE NAME:radeswan 13
WELL SINGLAP 2

SAMPLE TYPEWATER

WELL SINGLAP 2

SALT LAKE AREA

LOCATION: T26S, R132E, SEC. 4, 330FT S, 330FT E, FROM NE CORNER,

IMPERIAL COUNTY, CA, USA

WELL INFORMATION

GEOGRAPHY: GEOTHERMAL ENERGY AND MINERAL CROP.

WELL LOCATION: WESTERN, SOUTHERN GEOTHERMAL.

WELL DEPTH - 1271 FT, 14 APR 61

WELL YEAR PRODUCED: 09 NOV 60

WELL DATA

DEPTH ----- 722 METERS

BREIN DATA

AC: BREIN DATA AVAILABLE.

BIBLIOGRAPHIC DATA

SCHOOL OFFICE

PALEO, 758

RECORD 210

GLOSS NAME: SINGLAP 2

SAMPLE TYPEWATER

WELL SINGLAP 3

SALT LAKE AREA

LOCATION: T25S, R133E, SEC. 10, 330FT S, 330FT E, FROM NE CORNER,

IMPERIAL COUNTY, CA, USA

WELL INFORMATION

GEOGRAPHY: GEOTHERMAL ENERGY AND MINERAL CROP.

WELL LOCATION: WESTERN, SOUTHERN GEOTHERMAL.

WELL DEPTH - 2274 FT, 17 APR 63

WELL YEAR PRODUCED: 06 AUG 60

WELL DATA

DEPTH ----- 2110 METERS

SAMPLING INFORMATION

DATE: 15 APR 60

SAMPLE NUMBER: LABORATORY: GRT LABS, BAKERSFIELD, CA.

PHYSICAL DATA

PPM: 5.4

SPE: 0.4

SP: 100

WATER: 1271

FEC: 0

HEX: 0

KHE: 0

PH: 8.5

RDI: 1

BA: 90

CE: 100

Fe: 100

F: 0

SP: 200

VALUES PROBABLY NOT CORRECTED FOR STEAM LOSS.

BIBLIOGRAPHIC DATA

SOURCE:

GRT LABS, BAKERSFIELD, 75

WELL SINGLAP 3

SALT LAKE AREA

LOCATION: T25S, R133E, SEC. 10, 330FT S, 330FT E, FROM NE CORNER,

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CE: 100

Fe: 100

F: 0

SP: 200

VALUES PROBABLY NOT CORRECTED FOR STEAM LOSS.

BIBLIOGRAPHIC DATA

SOURCE:

GRT LABS, BAKERSFIELD, 75
**Record 273**
**Code Name:** Sinclair 3D
**Sample Type:** Water

**WELL SINCCLAIR 3**
**SAMPLE DATE:** 6/6/68
**IMPERIAL COUNTY, CA., USA**

**Sampling Information:**
- **Location:** Sampled for flow line test from 2130-4242' depth.

**Bible Data**
**Units:** ppm

<table>
<thead>
<tr>
<th>Constituent</th>
<th>Concentration</th>
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</thead>
<tbody>
<tr>
<td>Na</td>
<td>139000</td>
</tr>
<tr>
<td>Ca</td>
<td>20900</td>
</tr>
<tr>
<td>Mg</td>
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</tr>
<tr>
<td>K</td>
<td>1700</td>
</tr>
<tr>
<td>Cl</td>
<td>31600</td>
</tr>
<tr>
<td>PO4</td>
<td>113</td>
</tr>
<tr>
<td>HCO3</td>
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<tr>
<td>SO4</td>
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<td>Cl</td>
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**Biblilographic Data**
**Source:** DEP 92

---

**Record 274**
**Code Name:** Sinclair 3D
**Sample Type:** Water

**WELL SINCCLAIR 3**
**SAMPLE DATE:** 6/6/68
**IMPERIAL COUNTY, CA., USA**

**Sampling Information:**
- **Location:** Rich line test taken from 2130-4242' depth.

**Bible Data**
**Units:** ppm

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<tbody>
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<td>47700</td>
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<td>Ca</td>
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<tr>
<td>Mg</td>
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<td>1790</td>
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<tr>
<td>Cl</td>
<td>11500</td>
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<tr>
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<td>287</td>
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<td>HCO3</td>
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<td>SO4</td>
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**Biblilographic Data**
**Source:** DEP 92

---

**Record 275**
**Code Name:** Sinclair 3D
**Sample Type:** Water

**WELL SINCCLAIR 3**
**SAMPLE DATE:** 6/6/68
**IMPERIAL COUNTY, CA., USA**

**Sampling Information:**
- **Location:** Sampled by laboratory—Western Geothermal, Inc.

**Physical Data**
**Flow:** 2.4 gpm
**Test OSSS:** 12800,68 mg/l, sum

**Bible Data**
**Units:** mg/l

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<tr>
<th>Constituent</th>
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<tbody>
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<td>Na</td>
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<td>Ca</td>
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<tr>
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<tr>
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<td>300</td>
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<td>Cu</td>
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<td>1200</td>
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<td>Br</td>
<td>400</td>
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**Data Not Verified.**
**Biblilographic Data**
**Source:** DEP 92
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<td></td>
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<td>Na</td>
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<tr>
<td>K</td>
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<tr>
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Data not verified.

Bibliographic data

Source: DOE 55
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<tr>
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<th>Value</th>
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<tbody>
<tr>
<td>Temperature</td>
<td>25°C</td>
</tr>
<tr>
<td>Pressure</td>
<td>1 atm</td>
</tr>
<tr>
<td>Electrical Potential</td>
<td>1.5 volts</td>
</tr>
<tr>
<td>Test Milliamp</td>
<td>28.44</td>
</tr>
<tr>
<td>Test Milliamp</td>
<td>29.00</td>
</tr>
<tr>
<td>Source</td>
<td>Well 65</td>
</tr>
</tbody>
</table>

**Bibliographic Data**

- **Sources**:
  - Well 65
  - U.S. Bureau of Mines
  - NBS 200
  - NBS 300
  - NBS 400

**Concentration should be reduced by 2.5 percent to obtain concentration on unfiltered basis.**
<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>CONCENTRATION</th>
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<tbody>
<tr>
<td>Fe</td>
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<tr>
<td>Mg</td>
<td>35.9</td>
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<td>Na</td>
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<td>4100</td>
</tr>
<tr>
<td>K</td>
<td>4100</td>
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<tr>
<td>Mn</td>
<td>4100</td>
</tr>
<tr>
<td>Sr</td>
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<td>Ba</td>
<td>4100</td>
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**BIBLIOGRAPHIC DATA**

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<tr>
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<td>MCCARTY 75</td>
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<td>MCCARTY 76</td>
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<td>MELLECH 68</td>
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<td>RUFFLER 89</td>
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</table>

**LIQUID PHASE OF SAMPLE ANALYZED ONLY—RESULTS NOT QUANTITATIVE.**
WELL SINCERELA A
SAVANNAH TWP.
EMPERIAL COUNT., CA., USA

WELL DATA
DEPTH 721 FT AT MEGHEAD
TEMPERATURE 72°F

SAMPLING INFORMATION
DATE 7/27/67

PHYSICAL DATA
SPECIFIC GRAVITY 1.202

Minerals:
SIO 2
AL
Fe
Ca
Mg
K
Na
Cl
Br
CO
H20

DATA CORRECTED PER STEAM LOSS.

BIBLIOGRAPHIC DATA
SOURCE-
COMM 70

WELL SINCERELA A
SAVANNAH TWP.
EMPERIAL COUNT., CA., USA

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DEPTH 721 FT AT MEGHEAD
TEMPERATURE 72°F

SAMPLING INFORMATION
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PHYSICAL DATA
SPECIFIC GRAVITY 1.202

Minerals:
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Fe
Ca
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H20

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Minerals:
SIO 2
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Fe
Ca
Mg
K
Na
Cl
Br
CO
H20

DATA CORRECTED PER STEAM LOSS.

BIBLIOGRAPHIC DATA
SOURCE-
COMM 70
RECORD 294
ECCO NAPK-NECALA OR
SAMPLE TYPE-WATER

WELL SINGL-4
SALT N. S. C. M.
SOUTH DAKOTA COUNTY, CA, USA

WELL DATA
DATE = 10/27 MRS.
TEMPERATURE 295 0 AT WELL-HEAD

SAMPLING INFORMATION
DATE = 25 SEP 76

PHYSICAL DATA
PHYS. 215

REMARKS SOLIDS 207300.00 MG/L, RESIDUE EN EVAPORATION

OPEN DATA
UNITS = mg/l

CONCENT.

AL 0.0100

CONCENT.

AS < 0.10

CONCENT.

Ca 350

CONCENT.

Mg 300

CONCENT.

SiO2 700

CONCENT.

SO4 170

CONCENT.

Fe < 0.01

CONCENT.

Mn < 0.01

CONCENT.

P 0.01

CONCENT.

Ba < 0.01

CONCENT.

Sr < 0.01

CONCENT.

TB 0.01

CONCENT.

Y < 0.01

CONCENT.

DATA NOT VERIFIED.

BIBLIOGRAPHIC DATA
SOURCE:

RECORD 295
ECCO NAPK-NECALA OR
SAMPLE TYPE-WATER

WELL SINGL-4
SALT N. S. C. M.
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TEMPERATURE 295 0 AT WELL-HEAD

SAMPLING INFORMATION
DATE = 25 SEP 76

PHYSICAL DATA
PHYS. 215

REMARKS SOLIDS 207300.00 MG/L, RESIDUE EN EVAPORATION

OPEN DATA
UNITS = mg/l

CONCENT.

Na 30000

CONCENT.

K 30000

CONCENT.

Mg 300

CONCENT.

Ca 210

CONCENT.

Mn < 0.01

CONCENT.

P 0.01

CONCENT.

Ba < 0.01

CONCENT.

Sr < 0.01

CONCENT.

TB 0.01

CONCENT.

Y < 0.01

CONCENT.

DATA NOT VERIFIED.

BIBLIOGRAPHIC DATA
SOURCE:

ECCO NAPK-NECALA OR
SALT N. S. C. M.
SOUTH DAKOTA COUNTY, CA, USA
### WELL SINGULAR 4
**Location:** Imperial County, CA, USA

#### Sampling Information
- **Date:** 21 July 79
- **Sample Number:** Single
- **Sample Description:** Single
- **Sample Location:** Single
- **Method:** Single
- **Volume:** Single

#### Biogeochemical Data
- **Variables:** Single
- **Method:** Single
- **Units:** Single

#### Gas Analysis
- **Constituents:** Single
- **Conditions:** Single
- **Comments:** Single

### WELL SINGULAR 4
**Location:** Imperial County, CA, USA

#### Sampling Information
- **Date:** 21 July 79
- **Sample Number:** Single
- **Sample Description:** Single
- **Sample Location:** Single
- **Method:** Single
- **Volume:** Single

#### Biogeochemical Data
- **Variables:** Single
- **Method:** Single
- **Units:** Single

#### Gas Analysis
- **Constituents:** Single
- **Conditions:** Single
- **Comments:** Single

---

### WELL SINGULAR 4
**Location:** Imperial County, CA, USA

#### Sampling Information
- **Date:** 21 July 79
- **Sample Number:** Single
- **Sample Description:** Single
- **Sample Location:** Single
- **Method:** Single
- **Volume:** Single

#### Biogeochemical Data
- **Variables:** Single
- **Method:** Single
- **Units:** Single

#### Gas Analysis
- **Constituents:** Single
- **Conditions:** Single
- **Comments:** Single

---

### WELL SINGULAR 4
**Location:** Imperial County, CA, USA

#### Sampling Information
- **Date:** 21 July 79
- **Sample Number:** Single
- **Sample Description:** Single
- **Sample Location:** Single
- **Method:** Single
- **Volume:** Single

#### Biogeochemical Data
- **Variables:** Single
- **Method:** Single
- **Units:** Single

#### Gas Analysis
- **Constituents:** Single
- **Conditions:** Single
- **Comments:** Single

---

### WELL SINGULAR 4
**Location:** Imperial County, CA, USA

#### Sampling Information
- **Date:** 21 July 79
- **Sample Number:** Single
- **Sample Description:** Single
- **Sample Location:** Single
- **Method:** Single
- **Volume:** Single

#### Biogeochemical Data
- **Variables:** Single
- **Method:** Single
- **Units:** Single

#### Gas Analysis
- **Constituents:** Single
- **Conditions:** Single
- **Comments:** Single

---

### WELL SINGULAR 4
**Location:** Imperial County, CA, USA

#### Sampling Information
- **Date:** 21 July 79
- **Sample Number:** Single
- **Sample Description:** Single
- **Sample Location:** Single
- **Method:** Single
- **Volume:** Single

#### Biogeochemical Data
- **Variables:** Single
- **Method:** Single
- **Units:** Single

#### Gas Analysis
- **Constituents:** Single
- **Conditions:** Single
- **Comments:** Single
BIBLIOGRAPHY AND RELATED REFERENCES
TITLE: GEOTHERMAL WELLS IN THE UNITED STATES.
AUTHOR: H.D. JACOBSON. U.S. GEOLOGICAL SURVEY (USGS), EARTHSCIENCE DIVISION.
REFERENCE: GEOTHERMAL WELLS IN THE UNITED STATES. U.S. GEOLOGICAL SURVEY, UNPUBLISHED, MAY 1979. 33 P.
DESCRIPTIONS: GEOTHERMAL WELLS USGS WELL CHARACTERISTICS.

TITLE: RESISTIVITY, SELF-POWERS, AND INDUCTIVE-INDICATOR SURVEYS IN A RAPID-ESTIMATED GEOTHERMAL SYSTEM.
DESCRIPTIONS: VELESTINNE NATIONAL PARK: RESISTIVITY SURVEYS ON-RAPID-ESTIMATED HYDROTHERMAL SYSTEMS GEOLOGICAL SURVEYS.